CONSERVATION PLAN

CITY OF TUMWATER

2010 Update

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INTRODUCTION

This Conservation Plan is an element of the City's Comprehensive Plan and has been created to meet State Growth Management Act requirements to identify, protect and conserve critical environmental areas and valuable natural resources. This plan specifically addresses the above-mentioned topics in the following fashion:

Natural Resource Lands Conservation:
- Agricultural Lands
- Forest Lands
- Mineral Resource Lands

Critical Areas Protection:
- Wetlands
- Aquifer Recharge Areas
- Frequently Flooded Areas
- Geologically Hazardous Areas
- Fish and Wildlife Habitat Areas

In addition to identifying these lands and setting forth policy to protect and conserve them, this plan is immediately implemented into law by the inclusion of companion ordinances. These ordinances are contained in the appendix and cover the following topics:

- Legally-established farms are allowed to operate free of nuisance suits.
- Legally-established mineral extraction facilities are allowed to operate free of nuisance suits.
- Wetlands are protected from filling and adverse environmental effect without adequate mitigations.
- The City's underground aquifer is protected from chemical/biological contamination (three ordinances on this topic).
- Geologically-hazardous areas are restricted in use and development.
- Fish and wildlife habitats are preserved and protected from new adjacent developments.

As drafted, the State Growth Management Act provides the possibility of conflict between the two goals of protecting critical areas and effectively conserving/utilizing natural resources. In the event that conflict does occur in the subsequent

implementation of the planning and development regulations contained herein, the priority of preserving and protecting critical areas will be superior to conserving/ utilizing natural resources.

This plan and implementing ordinances have been prepared in conformance with the City's adopted Citizen Participation/ Intergovernmental Review Policy as required by the Growth Management Act and set forth in City Resolution #418.

Best Available Science

RCW 36.70A.172 and WAC 365-195-900 through 365-195-925 require jurisdictions to use Best Available Science (BAS) in revising or adopting new policies and regulations related to critical areas. Utilization of BAS is particularly important to salmon recovery efforts required under the Endangered Species Act. BAS is essentially a process to assist jurisdictions in ascertaining what science is appropriate for use in basing policy and regulatory decision-making. Tumwater will use BAS in all revisions and additions to critical areas policies and regulations.

SECTION 1

NATURAL RESOURCES CONSERVATION

1. AGRICULTURAL LANDS

1.1 Introduction:

Access to healthy food choices is an important public health issue. Lack of healthy food choices contributes to obesity and other health problems such as diabetes, heart disease and cancer. Access to healthy food and local food production are clearly part of planning for a vital, healthy community.

The City of Tumwater Strategic Plan has a number of goals and policies directly related to environmental sustainability and increasing the availability of healthy food. In the United States, produce found in an average grocery store has traveled 1500 miles, and over 20% of the country's fresh fruits and vegetables are imported annually. Long distance transportation consumes an enormous amount of fossil fuel and generates a great deal of greenhouse gases. Increased local food production has a direct beneficial effect on the environment by reducing greenhouse gas emissions. Transportation costs are much lower for local food producers. Also a direct benefit to the community is the provision of fresh, healthy, locally grown food. Decreasing regulatory barriers and encouraging a wide range of local food production options compatible in an urban environment are important policy decisions in furthering the sustainability goals of the City.

The conservation and protection of prime agricultural lands are essential to our economic and nutritional needs. Food, feed, forage, fiber and oil seed crops are all best produced on prime farmland soils which provide superior physical and chemical characteristics. Historically, valuable agricultural lands have been pushed out and eliminated by urbanization in the form of low-density suburban sprawl located outside cities and their urbanized environments.

1.2 Sustainable Urban Agriculture:

Sustainable urban agriculture meeting the goals of the Strategic Plan and this plan takes a variety of forms.

1) Urban Farm: An urban farm is where plants and/or some animals are grown for sale of the plants and animals or their products, and in which the plants and animals or their products are sold either on the lot where they are grown or off site, or both. Examples may include flower and vegetable raising, orchards and vineyards. Urban farms are small scale agricultural uses and are listed in this plan for informational purposes in order to show a complete picture of food production options. It is not intended that urban farms be separated from "agriculture" in the zoning code.

2) Community Garden: A community garden means land managed by a public or nonprofit organization, or a group of individuals, that is used to grow plants and harvest food or ornamental crops from them for donation or use by those cultivating the land and their households.

3) Individual Home Garden: A home garden simply means a garden grown on a residential lot as an accessory use to the principal structure for the use of the occupants. Home Gardens are listed in this plan for informational purposes in order to show a complete picture of food production options. It is not intended that home gardens be treated any differently in the zoning code.

4) Farmers Market: A farmers market consists of a group of individual venders primarily selling locally grown produce and products. This use typically is seasonal and may be temporary. Some examples are set up on closed streets or on portions of sites used for other primary uses.

1.3 Agricultural Lands Classified:

This plan's classification and identification of agricultural lands of long-term significance is based partially upon the land-capability classification system of the United States Department of Agriculture Handbook No. 210. The classes of agricultural lands are based upon consideration of growing capacity, productivity, and soil composition of the land.

In further defining categories of agricultural lands of long-term significance, the reference standard is the use of the classification of prime and unique farmland soils as mapped by the Soil Conservation Service. Lastly, this plan recognizes that prime agricultural lands in the City have been substantially overlaid by urban uses and zones. These circumstances do not allow for a classification of long-term significance to be applied.

1.4 Agricultural Lands Conserved:

Of prime importance in defining the long-term significance of agricultural lands is taking into account the proximity to populated areas and the possibility of more intense uses of the land as indicated by:

- The availability of public facilities (available);
- Tax status (special tax status available);
- The availability of public services (available);
- Relationship or proximity to urban growth areas (within the Thurston UGMA);
- Predominant parcel size (moderate);
- Land use settlement patterns and their compatibility with agricultural practices (surrounding land uses of urban/suburban densities);
- Intensity of nearby land uses (urban or soon-to-be urban density);
- History of land development permits issued nearby (an urbanizing area);
- Land values under alternative uses (urbanized and urbanizing based upon highest and best use market driver); and
- Proximity of markets (local and regional).

1.5 Tumwater Agricultural Lands Identified:

Within the City of Tumwater the following soil types meet the definition of the Soil Conservation Service (SCS) as prime and unique farmland soils.

Also, a review of the Soil Conservation Service Soil Survey Maps (13 and 18) covering Tumwater and its Urban Growth Area show the following prime and unique farmlands to be present, overlaid by urbanized, open space or agricultural land uses. The following chart is developed from the SCS Soil Survey of Thurston County. When soils are shown as prime/unique farmland, "where drained" does not imply that this plan encourages such action.

Map Unit #	Prime/Unique Farmland Soil Description	In Tumwater
41	Godfrey silty clay loam (where drained)	Yes
69	Mukilteo muck (where drained)	Yes
70	Mukilteo muck, drained	Yes
73	Nisqually loamy fine sand, 0 to 3 percent slopes (where irrigated)	Yes
76	Norma silt loam (where drained)	Yes
88	Puget silt loam (where drained)	Yes
89	Puyallup silt loam	Yes
106	Shalcar Variant muck (where drained) drained)	Yes
115	Sultan silt loam	Yes
126	Yelm fine sandy loam, 0 to 3 percent slopes	Yes

1.6 Tumwater Agricultural Lands Protected:

While an urban area is generally not conducive to large scale farming, there is certainly a role for smaller scale urban farms and community gardens. Because of the importance of food access, food security, and overall environmental sustainability, there is a role for Tumwater in encouraging a wide range of farming and gardening within Tumwater. This role may evolve over time, but can begin with analyzing the existing regulatory barriers that do not foster the healthy food security and environmental goals of the city.

Regulatory Barrier Assessment:

A thorough review of the City's zoning and development codes should be conducted to eliminate existing regulatory barriers to increasing the supply of healthy, locally grown food. The following Tumwater Municipal Code amendments should be considered:

- Add definitions for key terms such as "Community Garden" and "Farmers Market".

- Allow community gardens as a permitted use in all appropriate zones.

- Clearly define suitable zones for farmers markets.

- Allow agriculture within certain size limitations as a permitted use in appropriate zones including the Residential/Sensitive Resource Zone.

- Consider allowing roadside stands as a part of an agricultural operation that would allow sales directly at/from the farm.

- Examine signage requirements regarding urban farms.

- Consider adding a new section to the zoning code that specifies requirements and standards for agriculture. This should be considered as an alternative to creating conditional use permit requirements which can act as both regulatory and financial barriers.

- Consider fence height exceptions to allow urban farms to protect crops from wildlife damage.

- Consider allowing egg laying fowl in appropriate zones with conditions and limitations.

2. FOREST LAND RESOURCES

2.1 Introduction:

Forest lands are a paramount economic raw resource for Washington State's economy. This valuable resource must be husbanded to insure that in the future a continuous production of timber and forest products are assured. It is the State's policy to encourage forestry and restocking and reforesting of forests (RCW 84.33.010). It is through the proper management of forestry that environmental benefits will also accrue in areas of enhanced water quality, air quality, reduction of soil erosion, lessening of storm and flood damage, protection of valuable wildlife habitats, provision of scenic and recreational spaces, and providing a valuable buffer of a natural ecological equilibrium.

2.2 Forest Land Resources Identified:

The State Growth Management Act requires cities and counties to classify and conserve resource lands, including forest lands. The classification of the forest lands is to be based upon the private forest land grades of the Department of Revenue (WAC 458-40-530).

This classification system incorporates consideration of growing capacity, productivity and soil composition of the land. Forest land of long-term commercial significance will generally have a predominance of the higher private forest land grades. However, the presence of lower private forest land grades within the areas of predominately higher grades need not preclude designation as forest land.

Worked into this plan's identification of forest lands are considerations of long-term commercial significance, proximity to urbanized areas and the possibility of more intense uses of land. Forest lands can most often be identified by reviewing the land parcel tax base to discover large tracts of land which declare themselves "open space" or "designated forest land" thereby acquiring a reduced tax rate.

In defining what lands could be identified by the State classification system as forest lands, the beginning point of definition is a cross-reference of species, site index and land grades:

Washington State Private Forest Land Grades

Species	Site Index	Land Grade
Douglas Fir	136 ft. and over	1
	118 - 135 ft.	2
	99 - 117 ft.	3
	84 - 98 ft.	4
	under 84 ft.	5
Western Hemlock	136 ft. and over	1
	116 - 135 ft.	2
	98 - 115 ft.	3
	83 - 97 ft.	4
	68 - 82 ft.	5
	under 68 ft.	6
Red Alder	117 ft. and over	6
	under 117 ft.	7

(Land Grade 1 = highest, Land Grade 7 = lowest)

Forest lands are further defined by operability classes based upon characteristics of soils and geomorphic features. The criteria are applied as follows:

- **Class 1 - Favorable**. Stable soils that slope less than thirty percent. Forest operations do not significantly impact soil productivity and soil erosion. Forest operations, such as roading and logging, are carried out with minimal limitations.

- **Class 2 - Average**. Stable soils that slope less than thirty percent, but on which significant soil erosion, compaction, and displacement may occur as a result of forest operations.

- **Class 3 - Difficult**. Soils with one or both of the following characteristics:

  a) Stable soils that slope between thirty and sixty-five percent; and

  b) Soils that slope between zero and sixty-five percent, but display evidence that rapid mass movement may occur as a direct result of forest operations.

- **Class 4 - Extreme**. All soils that slope more than sixty-five percent.

2.3 Forest Lands Conserved:

When considering the effects of proximity of Tumwater's populated areas on the successful conservation of forest lands, the following items are considered:

- The availability of public services and facilities conducive to the conversion of forest land (available);
- The proximity of forest land to urban and suburban areas and rural settlements: forest lands of long-term commercial significance are located outside the urban and suburban areas and rural settlements (located within an urban area);
- The size of the parcels: forest lands consist of predominantly large parcels (parcels identified are modest in size);
- The compatibility and intensity of adjacent and nearby land use and settlement patterns with forest lands of long-term commercial significance (adjacent land uses of urban land use intensity);
- Property tax classification: Property is assessed as open space or forest land pursuant to chapter 84.33 or 84.34 RCW (2 parcels identified);
- Local economic conditions which affect the ability to manage timberlands for long-term commercial production (judged not to be supportive in the long term); and
- History of land development permits issued nearby (other large tracts in the City have been harvested under Class 4 DNR permits indicating land use conversions are to occur).

2.4 Tumwater Forest Lands Identified:

Thurston County Assessor public records show that only two parcels within Tumwater and its Urban Growth Boundary are designated forest lands. These two parcels are 40 and 43.43 acres respectively. The surrounding zoning/land uses adjacent to these locations and parcels are as follows:

Parcel #	Adjacent Zoning	Adjacent Land Use
1. Tax Code 12829410000 Sec. 29, Township 18, Range 2W	North - CI South - CI/RA East - CI/RA West - CI/RA	Gravel pit extraction Low-density Residential Gravel pit extraction Open space/Low-density Residential

2. Tax Code 12833130000 Sec. 33, Township 18, Range 2W	North - MDR 2-8/1 South - CI East - RM West - RS	Low-density Residential Beehive Industrial Park Residential Low-density Residential

(CI = Commerical/Industrial; RA = Residential/Agricultural; RS = Residential Single Family; RM = Residential Medium Density; MDR = Medium Density Residential - County Zone)

While only two parcels are identified by the Assessor's office as having forest land tax status, this does not preclude the possibility of other parcels, not so identified, intended to be used as forest land.

2.5 Tumwater Forest Lands - Long Term Urbanization:

The State Growth Management WAC 365-190-060 (2) states that forests of long-term commerical significance are located outside the urban areas/suburban areas and rural settlements. Therefore, the two identified parcels of forest land (as well as any others now or in the future) within Tumwater are not considered by this plan to be of long-term significance and will not be designated protected resource lands. As future parcels of property are annexed or planned for within context of the Thurston County Urban Growth Management Agreement, this method of designating commercial forest lands of long-term significance will be pursued as a goal of this plan.

No subsequent implementing ordinance is needed to implement the Forest Land Resources chapter of this plan.

Given no incentive to continue forestry of the two designated forest land parcels within the City limits of Tumwater, it is highly likely that as urbanization trends continue, these parcels ultimately will be logged and converted to the predominant adjacent land uses of Commercial/Industrial or Low-Density Residential.

While no forest lands of long-term significance are currently identified, those parcels of land that are currently forested are encouraged to remain forested for their environmental and open space benefits, as long as possible, before converting to urbanized land uses.

3. MINERAL RESOURCE LANDS

3.1 Introduction:

As with other types of resource lands discussed in this plan, the identification and conservation of mineral resource lands is a requirement placed upon Tumwater by the State Growth Management Act. This plan will identify and classify mineral resource lands from which the extraction of minerals can be anticipated. Also, a strategy to ensure a future supply of these minerals will be discussed. As a definition, minerals and the resource lands within which they are mined apply to resources including gravel, sand, and valuable metallic substances that have a known or potential long-term commercial significance.

3.2 Mineral Resource Lands Defined:

In defining what lands qualify as "mineral resource lands", this plan bases its methodology upon the "Mineral Resource Land Classification System" developed by the Washington State Department of Natural Resources with modification to include consideration of environmentally-sensitive areas, existing land use, and land ownership factors.

The Mineral Resource Lands Classification Criteria is as follows:

Marketability - Strategic (in short domestic supply) and non-strategic minerals which are minable, recoverable and marketable in the present or foreseeable future (50 years).

Threshold Value - The gross selling price of the first marketable product from an individual mineral deposit. For those that meet the marketability criteria, only those which exceed the following threshold values in 1990 equivalent dollars shall be considered significant:

- **Construction Materials** - Sand, gravel, or crushed rock that normally receive minimal processing (commonly washing and grading): **Minimum Value $5,000,000**

- **Industrial and Chemical Mineral Materials** - Non-metallic mineral materials that normally receive extensive processing such as heat or chemical treatment or fine sizing. Examples include limestone, marble, specialty sands, clays, peat, coal, borates, gypsum, talc, feldspar, building and dimension stone, rock varieties produced into granules, rock floor, mineral wool and similar commodities: **Minimum Value $1,000,000**

- **Metallic and Rare Minerals** - These are metallic elements, minerals and gemstones that possess special properties valuable to science and industry.

Examples include ores, deposits, or crystals of: precious metals (such as gold), iron and ferro-alloy metals (such as tungsten), base metals, mercury, uranium, rare earths, minor metals (such as rubidium), gemstones: **Minimum Value $500,000**

- **Non-Fluid Mineral Fuels** - These are non-hydrothermal mineral fuels occurring in sedimentary rocks such as: coal, coal bed methane, lignite, peat, organic shale, tar sand, uranium and thorium: **Minimum Value $1,000,000**

- **Unique or Rare Occurrences** of rocks, minerals or fossils that are of outstanding scientific significance: **No Minimum Value**

3.3 Mineral Resource Lands Identified:

This plan will identify lands with long-term commercial significance for extracting the mineral resources outlined in Section 3.2.

The following Mineral Resource Areas (MRA) and Scientific Resource Sites (SRS) categories are used in classifying lands:

- **MRA-1**: Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that there is little likelihood for their presence. This area shall be applied where well-developed lines of reasoning, based upon economic geological principles and adequate data, demonstrate that the likelihood for occurrence of significant mineral deposits is nil or slight.

- **MRA-2**: Areas where adequate information indicates that significant mineral deposits are present or where it is judged that there is a high likelihood for their presence. This area shall be applied to known mineral deposits or where well-developed lines of reasoning, based upon economic geologic principles and adequate data, demonstrate that the likelihood for occurrence of significant mineral deposits is high.

- **MRA-3**: Areas containing mineral deposits the significance of which cannot be evaluated from available data.

- **MRA-4**: Areas where available information is inadequate for assignment to any other MRA.

- **SRS**: Areas containing unique or rare occurrences of rocks, minerals, or fossils that are of outstanding scientific significance.

3.4 Tumwater Mineral Resource Lands Identified:

Six sources of information are referenced for the present and future distribution of

Tumwater's mineral resources:

1) Inventory of Abandoned Coal Mines in the State of Washington: Published by the US Department of Interior/ Washington State Department of Natural Resources (1985).

2) Washington State Coal Mine Map Collection: Published by the Washington State Department of Natural Resources (1983).

3) Geologic Map of the Centralia Quadrangle, Washington: Published by the Washington State Department of Natural Resources (1987).

4) Tumwater Aerial Photographs (1989)

5) Tumwater Land Use Inventory (1991)

6) Telephone Conversations with Washington State Department of Natural Resources Staff

These six sources of mineral resource distribution have identified the following sites which now, or in the future, will provide valuable mineral resources:

	Location			
Mineral Resource	Section	Township	Range	Status
Igneous Rock Quarry (Black Lake Boulevard)	29	18	2W	MRA-2
Sand/Gravel Pit (101)	28	18	2W	MRA-2
Sand/Gravel Pit (R.W. Johnson)	21	18	2W	MRA-2
Sand/Gravel Pit (26th Avenue)	29	18	2W	MRA-2
All Mineral Resources	Locations City-Wide Unknown			MRA-4

Mineral resource lands identified are subject to consideration of the effects of proximity to population areas and the possibility of more intense uses of land as indicated by:

- General land use patterns in the area (urban);
- Availability of utilities (available);
- Availability and adequacy of water supply (available);
- Surrounding parcel sizes and surrounding uses (small-medium sized parcels, land uses industrial and commercial in nature);
- Availability of public roads and other public services (yes);
- Division or zoning for urban or small lots (yes);
- Accessibility and/or distance from point of use (in close proximity);
- Physical and topographic characteristics of the mineral resource site

(accommodating to low operating costs);
- Depth of the resource (exposed at surface);
- Depth of the overburden (exposed materials);
- Physical properties of the resource (high grade gravels, sands and rock);
- Life of the resource (10 to 100 years); and
- Resource availability in the region (good for sands/gravel, limited on rock).

There also exists the possibility that future discoveries of mineral resources, or conducive market conditions, may encourage the opening of new mineral resource extraction operations. What or where these facilities would locate cannot be accurately gauged. This plan proposes to treat existing and future emerging mineral resource extraction sites in the following manner:

1) A newly-established mineral resource extraction facility must be a land use identified within the zone(s) applying to the site.

2) A "Right to Mine" ordinance be created within the City's Environmental Code, Title 16. This ordinance would protect legally-established mineral resource extraction facilities and would have the following attributes:

Intent:

It is the declared policy of the City of Tumwater to conserve and protect its valuable mineral resource lands and operations established to extract those minerals. When other land uses locate near extraction uses, those extraction uses can be subject to nuisance suits. As a result, mineral resource extraction facilities can be forced to cease operations. Future reinvestment into mineral resources operations can also be discouraged by the presence of unfriendly or non-compatible neighbors. It is the intent of the City to limit the circumstances under which mineral resource extraction operations may be deemed a nuisance and claims made against them.

Limitation on Nuisance Claims:

1) No mineral resource extraction operation or any of its appurtenances shall be or become a nuisance, private or public, by any changed conditions in or about the locality thereof after the same has been in operation for more than one year, when such operation was not a nuisance at the time the operation began; provided that the provisions of this subsection shall not apply whenever a nuisance results from the negligent or improper operation of any such operation or its appurtenances.

2) For the purpose of this code, "mineral resource extraction" refers to operations that mine the following substances:

Construction Materials - Sand, gravel, or crushed rock that normally receive minimal processing (commonly washing and grading): **Minimum Value**

$5,000,000 (Inflation adjusted to 1990 dollars.)

Industrial and Chemical Mineral Materials - Non-metallic mineral materials that normally receive extensive processing such as heat or chemical treatment or fine sizing. Examples include limestone, marble, specialty sands, clays, peat, coal, borates, gypsum, talc, feldspar, building and dimension stone, rock varieties produced into granules, rock floor, mineral wool and similar commodities: **Minimum Value $1,000,000** (Inflation adjusted to 1990 dollars.)

Metallic and Rare Minerals - These are metallic elements, minerals and gemstones that possess special properties valuable to science and industry. Examples include ores, deposits, or crystals of: precious metals (such as gold), iron and ferro-alloy metals (such as tungsten), base metals, mercury, uranium, rare earths, minor metals (such as rubidium), gemstones: **Minimum Value $500,000** (Inflation adjusted to 1990 dollars.)

Non-Fluid Mineral Fuels - These are non-hydrothermal mineral fuels occurring in sedimentary rocks such as : coal, coal bed methane, lignite, peat, organic shale, tar sand, uranium and thorium: **Minimum Value $1,000,000** (Inflation adjusted to 1990 dollars.)

Unique or Rare Occurrences of rocks, minerals or fossils that are of outstanding scientific significance: **No Minimum Value**

3) Any and all ordinances of the City now in effect or hereafter adopted that would make the operation of any such mineral resource extraction operation or its appurtenances a nuisance in the circumstances set forth in this code are and shall be null and void; provided, however, that the provisions of this subsection shall not apply whenever a nuisance results from the negligent or improper operation of any such mineral resource extraction operation or any of its appurtenances.

4) The determination that a mineral resource extraction operation is being run in a negligent or improper manner shall be determined by the City's Director of Community and Economic development with that decision appealable to the City Hearing Examiner and, subsequently, the City Council. Appeal fees are to be established by City Council resolution.

5) Upon the cessation of mining operations, reclamation of the site should proceed in accordance with all applicable federal, state, and local regulations.

6) Mining facilities should operate in a manner consistent with all applicable federal, state, and local regulations.

7) All plats, short plats, development permits, and building permits issued for development activities on, or within three hundred feet of, lands designated as

mineral resource extraction facilities, shall contain a notice that the subject property is within or near a mineral resource extraction facility on which a variety of commercial activities may occur that are not compatible with residential development for certain periods of limited duration.

SECTION 2

CRITICAL AREAS PROTECTION

1. WETLAND AREAS

1.1 Introduction

Wetlands serve many important ecological and social functions. Tumwater's wetlands act as natural reservoirs for flooding and stormwater runoff; protect water quality by filtering out pollutants; help stabilize shorelines with their root systems; provide areas for groundwater recharge; provide habitat areas for fish, wildlife, and vegetation; provide open space and recreation opportunities; and provide areas for scientific study and natural resource education.

Wetlands preservation can significantly reduce public and private costs associated with downstream flooding, poor water quality, and diminishing wildlife habitat.

Tumwater intends to preserve, protect, manage, and regulate wetlands for the purpose of promoting public health, safety and general welfare while conserving fish, wildlife and other natural resources; protect the ecological and economic benefits to the public of wetlands functions and values; regulate property use and development to maintain the natural and economic benefits provided by wetlands; protect private property rights consistent with the public interest; and provide for protection against direct and indirect wetlands impacts by providing regulatory authority for management of wetland buffers.

It is the short-term goal of this policy to achieve no net loss of the remaining wetlands in Tumwater, defined by acreage and function. It is the long-term goal to create wetlands, where feasible, to increase the quantity and quality of wetlands in Tumwater.

1.2 Existing Wetland Policies, Regulations, and Inventories

There are a number of federal, state, and local wetland policies, regulations, and inventories that currently form a patchwork for wetlands protection.

Federal Clean Water Act:

This is broad-based law covering water pollution control in general. Section 404 of the Act requires the Army Corp of Engineers to regulate the filling of waters of the state. The dredging, draining or land clearing of wetlands of any size is not addressed by the Act. The Act does not regulate activities in wetlands of less than one acre, and does not completely address the range of possible wetland impacts even for wetlands larger than one acre in size.

State Shoreline Management Act:

Regulates activities in Shorelines of the State, which include marine waters, lakes over 20 acres in size, streams with flows in excess of 20 cubic feet per second (cfs), and all lands within 200 feet of the ordinary high water mark.

The Act excludes wetlands not "associated" with waters of the State, including isolated wetlands and riparian wetlands associated with lakes less than 20 acres and streams with flows less than 20 cfs. It also exempts most agricultural and forest practices from permit requirements.

State Hydraulics Code:

The Departments of Fisheries and Wildlife administer this program: the Hydraulic Project Approval process. The intent of the Code is to protect fish and fish habitat.

Wetlands outside the Ordinary High Water Mark and isolated wetlands without fish life are excluded. Does not address impacts to wetland functions and values other than fish and fish habitat.

Washington State Wetland Rating System for Western Washington:

This manual is very technical in nature and is currently the definitive methodology for determining when a wetland is present and where a wetland boundary is located. It is based on the functional values present in the wetland, sensitivity to disturbance, significance, rarity, and ability to replace.

National Wetlands Inventory:

Conducted on a national level using aerial photographs, it depicts wetland locations, approximate boundaries, and includes classification by wetland type. The inventory is available for Tumwater but should not be presumed to locate every wetland area in Tumwater. Often the only reliable method for wetland identification is a site visit by a qualified wetland biologist. This is typically done in conjunction with a development proposal.

Wetland Mapping for the Thurston Region:

This inventory by Thurston Regional Planning Council is based on color infrared aerial photographs. In many cases, the results of the aerial photography will be verified by field surveys. The end result is digitized maps showing wetlands boundaries and types. This inventory will need to be supplemented with site specific field surveys to clearly delineate wetland boundaries at the time of development permit review.

Tumwater Subdivision Code:

This code regulates the division of land, and does not specifically regulate wetlands. The Subdivision Code references Title 16 of the Tumwater Municipal Code for specific standards related to protection of wetland and other critical areas.

Tumwater Environmental Policy:

This code adopts the State Environmental Policy Act by reference. The intent of this code is to identify and if necessary, mitigate the environmental impacts associated with a variety of actions. Specific regulations regarding protection of wetlands are identified in TMC 16.28.

Tumwater Tree Protection Code:

This code regulates the clearing of land in Tumwater. Specific regulations regarding protection of trees are referenced in TMC 16.08.

Tumwater Shoreline Management Program:

Tumwater's Shoreline Management Program does not go beyond the regulations identified under the State Shoreline Management Act described above. In general, required Wetland buffer widths for wetlands regulated under the Shoreline Management Program are 50 feet.

Tumwater Floodplain Regulations:

The Floodplain Zone Overlay District in the Tumwater Zoning Code prohibits or strictly limits development in the base flood area. This minimizes out-of-bank flows during periods of flood, thus reducing adverse impacts to wetlands.

1.3 Wetland Values and Benefits

Wetlands serve many important ecological and social functions. In the past, wetlands were regarded as a nuisance to be drained and filled to accommodate development. As wetlands have disappeared, we have come to realize that the loss of wetlands comes at a severe cost; therefore, public policy has begun to change to reflect an appreciation of wetlands and their functions. A summary of wetland benefits follows:

- Wetlands are very important for slowing and storing flood waters. Riverine wetlands and floodplains provide flat areas where flood waters can spread out and slow down, reducing the height and velocity of floods. Flood waters trapped in wetlands may then slowly drain, reducing stream bank erosion and

downstream peaks;

- Wetlands provide erosion control for shorelines by dissipating the water's energy and stabilizing shorelines with the root systems of plants commonly found in wetlands;

- Wetlands improve water quality by their ability to filter out sediments, nutrients, and toxic chemicals. Moving water carries suspended sediments and other materials. As the water enters a wetland and slows down, these sediments tend to settle down. The sediments are then trapped by the wetland vegetation, which in turn reduces the amount of siltation deposited in lakes and reservoirs;

- Wetlands allow water to soak into the underlying soil, which adds to the supply of groundwater;

- Wetlands provide essential areas for waterfowl and migratory shorebirds to rest and feed;

- Wetlands provide essential escape cover and feeding, nesting, and breeding habitat for many species of fish and wildlife. Wetland plants help protect juvenile fish, thereby serving to increase the anadromous fish population;

- Wetlands furnish areas for education and research of a variety of flora and fauna that cannot be found in other environments;

- Wetlands provide open space and recreation opportunities, including fishing, hiking, boating and bird watching.

1.4 Wetland Protection Areas Classified

The State Growth Management Act (RCW 36.70A) requires cities and counties to classify wetlands according to relative function, value, and uniqueness. Tumwater will use the Washington State Wetland Rating System for Western Washington for classifying wetlands as outlined below, which will be further identified in the wetlands protection ordinance.

Category I wetlands:

Those regulated wetlands of exceptional resource value based on the presence of priority species or rare wetland communities, sensitivity to disturbance, and irreplaceable ecological functions.

Category II wetlands:

Those regulated wetlands of significant resource value based on significant functional value and diversity, wetland communities of infrequent occurrence, and other attributes that may not be adequately replicated through creation or restoration.

Category III wetlands:

Those regulated wetlands that have important resource value based on vegetative diversity.

Category IV wetlands:

Those regulated wetlands of ordinary resource value based on monotypic vegetation of similar age and class, lack of special habitat features, and isolation from other aquatic systems.

1.5 Wetland Identification

Identification of wetlands will be undertaken primarily on a case-by-case basis at the time an application for development is made, using the Washington State Wetland Rating System for Western Washington in their current form and as hereafter amended.

A qualified wetland biologist should be employed by the development applicant, at their cost, to identify wetland areas and delineate wetland boundaries. A list of qualified wetland biologists is available for use by applicants. Use of a qualified wetland biologist not on the list is subject to review and approval by the Development Services Director.

1.6 Wetland Protection Concerns

Concerns about wetlands in Tumwater and the Thurston region, in general, include:

- Very conservative estimates of wetlands losses in Washington State indicate that Washington has lost over 33 percent of its wetlands;

- Nationally, the United States is estimated to have lost at least 50% of its original wetlands;

- Increased development of impervious surfaces causes increased storm and surface water runoff, further adding importance to wetlands functions of water storage and groundwater recharge;

- Increased impervious surfaces elevates the pollutant load of materials such as gasoline and oil, which is eventually deposited in the sediments of lakes, wetlands, and estuaries;

- Conversion of forest land to non-forest uses causes increased loading of wildlife into remaining wetland and forest land areas;

- Wetland losses have decreased the habitat available to fish, wildlife, and vegetation; and

- Many of the functions and values of remaining wetlands have been degraded because of off-site activities.

1.7 Wetland Protection Techniques

Techniques that can be used to protect wetland areas include:

- Use the Washington State Wetland Rating System for wetland classification based on function and value;

- Require a qualified wetland biologist to determine wetland type and boundary for development sites containing wetlands;

- Establish wetland buffers based on the relative value of the wetland in which no development or disturbance shall occur;

- Strive to achieve no net loss of wetland areas and functions;

- Strive to create wetlands in the long term, where feasible, to increase the quantity and quality of wetlands.

- Attempt to avoid impacts to wetlands altogether if practicable;

- If impact avoidance is impossible, attempt to reduce wetland impacts through mitigation;

- If impact avoidance and reduction is impossible, wetland compensation should be accomplished;

- Preliminary wetland mapping has been completed by The Thurston Regional Planning Council and is available at Tumwater City Hall. This mapping does not negate the requirement for on-site wetland identification by a qualified wetland biologist in conjunction with development proposals. It does, however, provide a starting point for wetland identification; and

- Provide education on the value of wetlands to developers and homeowners;

1.8 Tumwater Wetlands Protection

WAC 365-190-040 (1) states that when critical areas (including wetland areas) cannot be readily identified, these areas should be designated by performance standards or definitions. In this way, such areas can be specifically identified during the processing of a site-specific permit or development authorization.

The adoption of a "performance standards"-based identification and regulatory process, by its nature, closes out such options as the creation of overlay zones. For the purposes of wetland protection, a "performance standards"-based process will be followed.

A "performance standards"-based wetlands protection ordinance has been developed to classify, designate, and protect wetlands and their associated buffers from on-site and off-site activities impacts. This ordinance has provisions for reasonable wetland buffer areas and the means for avoidance and reduction of wetland impacts. Attributes of this ordinance include:

Wetland Buffer Areas:

Wetland buffer areas should be required adjacent to regulated wetlands in order to protect wetland functions and values. All wetland buffer widths should be measured from the wetland boundary as established by a field survey conducted by a qualified wetland biologist. Wetland buffers are the primary means by which wetland functions and values are protected. For detailed buffer width requirements, please refer to TMC 16.28.170.

Wetland buffer widths may be increased, reduced, or averaged on a case-by-case basis in accordance with best available science when an altered buffer is necessary to protect wetland functions and values in accordance with TMC 16.28 Wetland Protection Standards.

Wetland and Wetland Buffer Areas - Allowed Activities:

Certain limited low-intensity activities may be permitted in wetland buffer areas without a wetlands permit, provided these activities are not prohibited by any other chapter or law and they are conducted using best management practices.

- Conservation or preservation of soil, water, vegetation, fish, shellfish, and other wildlife that does not entail changing the structure or functions of the existing wetland;

- Outdoor recreational activities, including fishing, bird watching, hiking, boating, horseback riding, swimming, canoeing, and bicycling;

- The harvesting of wild crops in a manner that is not injurious to natural reproduction of such crops and provided the harvesting does not require tilling of soil, planting of crops, or alteration of the wetland by changing existing topography, water conditions, or water sources;

- The maintenance of drainage ditches;

- Education, scientific research, and use of nature trails;

- Navigation aids and boundary markers;

- Site investigative work necessary for land use application submittals such as surveys, soil logs, percolation tests and other related activities. In every case, wetland impacts should be minimized and disturbed areas should be immediately restored;

- Normal maintenance, repair, or operation of existing serviceable structures, facilities, or improved areas. Maintenance and repair does not include any modification that changes the character, scope, or size of the original structure, facility, or improved area and does not include construction of a maintenance road;

- Minor modification of existing serviceable structures within a buffer zone where modification does not adversely impact wetland functions.

1.9 Reasonable Use of Wetlands and Wetland Buffers

If an applicant for a proposed development demonstrates that application of these policies and associated regulations would deny all reasonable use of the property, conditioned development may be allowed if the applicant demonstrates that the criteria in TMC 16.28.190 are met.

1.10 Wetland Replacement Ratios

As a condition of any permit allowing alteration of wetlands and/or wetland buffers, the applicant should engage in the restoration, creation, or enhancement of wetlands and their buffers to offset loss of wetland function and value. It is recognized that the alteration of wetlands and/or wetland buffers is not desirable. Creation, restoration and enhancement of wetlands and/or wetland buffers is extremely difficult to achieve. Wetland alteration should only occur when impact avoidance and reduction is

impossible.

Because of the uncertainties in scientific knowledge regarding wetland restoration, creation and enhancement, the following acreage replacement ratios should be utilized:

Category I	6:1
Category II	3:1
Category III	2:1
Category IV	1.5:1

These ratios may be increased under the following circumstances:

- Uncertainty as to the probable success of the proposed restoration or creation;
- Significant period of time between destruction and replication of wetland functions;
- Projected loss of functional value; or
- The impact was unauthorized.

These ratios may be decreased for category II, III, and IV wetlands under the following circumstances:

- Documentation from a qualified wetlands specialist that the proposed mitigation actions have a very high likelihood of success;
- Documentation by a qualified wetlands specialist that the proposed mitigation actions will provide functions and values that are significantly greater than the wetland being impacted;
- The proposed mitigation actions are conducted in advance of the impact and have been shown to be successful;
- In all cases, a minimum acreage replacement ratio of 1:1 should be required.

2. AQUIFER RECHARGE AREAS

2.1 Introduction

Potable water is a basic life-sustaining element to be used and protected. All of the City of Tumwater's drinking water supply comes from underground aquifer areas delivered through such means as the famous "artesian wells" of the area.

Tumwater and the Thurston region have had extensive study and work done on identification and protection of underground aquifers through the auspices of the Thurston County Office of Water Quality and Resource Management. Tumwater is a participating member of the Northern Thurston County Groundwater Advisory Committee, which reports to the Department of Ecology (WAC 173-591-090). That committee oversees the development of technical data, creation of a ground water protection plan and citizen involvement in ground water protection. Also, the Ground Water Protection Program, a citizen-based effort to protect area ground water, is administered by the Thurston County Environmental Health Division. That division works to gather data to educate citizens, explore financing options and develop other tools to protect ground water.

2.2 Aquifer Recharge Areas Classified

The State Growth Management Act (RCW 36.70A) requires cities and counties to classify recharge areas for aquifers according to the vulnerability of the aquifer. Vulnerability is the combined effect of hydrogeological susceptibility to contamination and the contamination loading potential. High vulnerability is indicated by land uses that contribute contamination that may degrade groundwater, and hydrogeologic conditions that facilitate degradation. Low vulnerability is indicated by land uses that do not contribute contaminants that will degrade ground water, and by hydrogeologic conditions that do not facilitate degradation.

To characterize hydrogeologic susceptibility of the recharge area to contamination, Tumwater will use the following physical characteristics:

- Depth to groundwater;
- Aquifer properties such as hydraulic conductivity and gradients;
- Soil (texture, permeability and contaminant attenuation properties);
- Characteristics of the Vadose Zone including permeability and attenuation properties; and
- Other relevant factors.

The following have been considered to evaluate the contaminant loading potential:

- General land use;

- Waste disposal sites;
- Agriculture activities;
- Well logs and water quality test results; and
- Other information found about the potential for contamination (see 2.5 for further discussion).

The goals of Tumwater's classification strategy for recharge areas will be to effectively maintain the quality of the groundwater by prevention of contamination, with particular attention to recharge areas of high susceptibility. Classification of these areas will include:

- Consideration of the degree to which the aquifer is used, now or in the future, as a potable (drinking) water source;
- Protective measures to preclude further degradation;
- Practicability of treatment measures to maintain potability.
- Availability of alternative potable water sources; and
- The degree of sensitivity of contaminants entering the aquifer.

Areas that require a groundwater recharge protection overlay on aquifers used for potable (drinking) water. Examples include:

- Sole source aquifer recharge areas designated pursuant to the federal safe drinking water act;
- Areas established for special protection pursuant to a groundwater management program, chapters 90.44 and 90.54 RCW, and chapter 173-100 WAC;
- Areas designated for wellhead protection pursuant to the Federal Safe Drinking Water Act.

2.3 Aquifer Protection Concerns

Concerns about ground water in Tumwater and the Thurston region, in general, include:

- Few alternative sources of drinking water exist;
- Geologic conditions in the region leave aquifers unprotected and ground water extremely vulnerable to pollution;
- Septic systems, stormwater runoff, chemical spills, pesticides and fertilizers can add contaminants to ground water;
- Though the region's ground water is generally of good quality, it is showing increasing effects of human activities; and
- Urbanization and population growth are placing increased demands on limited ground water resources.

Potential sources of ground water (aquifer) pollution include pesticides and fertilizers, septic systems, hazardous materials, contaminated storm water and leaking underground storage tanks.

2.4 Aquifer Protection Techniques

Techniques which can be used to protect geologically-sensitive aquifers include:

- Adopting special protection measures to protect drinking water supplies;
- Water system inter-ties between purveyors encouraged;
- Changing zoning so that hazardous industry cannot locate close to major wells without strict mitigation and protection measures.
- Proper stormwater treatment and conveyance to reduce contaminants;
- Maintenance of stormwater facilities to insure effective operation;
- Requiring industries that use hazardous chemicals to have containment facilities to capture chemicals that might spill;
- Restrict the use of some pesticides in aquifer sensitive areas by inter-agency liaison between Federal, State and local governments;
- Providing education and technical assistance on pesticides and fertilizers to homeowners and farmers; and
- Establishing an annual permit and inspection program for all commercial and industrial establishments utilizing underground storage tanks, aboveground bulk plants and underground vaults.

2.5 Tumwater Aquifer Vulnerability and Protection

Soils overlying the aquifer in Tumwater are of two general types:

1) ALDERWOOD-EVERETT ASSOCIATION (85%): These soils are moderate to very deep and moderate to excessively drained, all placed on top of glacial outwash plains.

2) SPANAWAY-NISQUALLY ASSOCIATION (15%): These soils are very deep, somewhat excessively drained, and placed on glacial outwash terraces.

Both of these general groupings exhibit moderate to high rates of water transmission to the aquifer below. Of main concern with excessively drained soils are problems on sites used for septic tanks, stormwater discharges or hazardous substance storage. Introduction to and absorption by the soils of containment results in ground water contamination caused by a poor filtering capacity.

Wellhead protection is a high priority. The City of Tumwater has worked with the other northern Thurston County jurisdictions to develop regional wellhead protection policies to insure the protection and continued preservation of ground water, which is

the source of drinking water to over ninety percent of Thurston County residents. The regional wellhead protection policies were based on recommendations in the *Northern Thurston County Ground Water Management Plan* and the wellhead protection plans of the individual jurisdictions.

The goal of the regional protection policies is to prevent contamination from occurring and to manage the resource in a cooperative manner. The policies are applicable to water systems with over 1,000 service connections. The following regional policies should be implemented by the City of Tumwater:

1. Participate in the intergovernmental regional ground water program.
2. Encourage and allow reuse techniques and reclamation of waste water where water quality can be protected.
3. Work with other jurisdictions to maintain and support financially, as resources allow, a coordinated water quality and water quantity monitoring program through the Thurston County Regional Ground Water Program.
4. Participate in regional collection and management of data through the Thurston County Regional Ground Water Program.
5. Provide technical assistance and education, to the extent resources allow, in designated wellhead protection areas to small businesses, industries, and residents regarding proper storage, handling and disposal of hazardous materials.
6. Encourage through education and technical assistance the use of safer, less hazardous products and the reduction of hazardous materials.
7. Participate, as resources allow, in planning and collaborative training and the implementation of regional spill response in designated wellhead protection areas.
8. Consider methods to mitigate the risk from commercial hazardous materials transportation through designated wellhead protection areas when doing transportation planning for new transportation corridors.
9. Consult with the appropriate regional transportation planning agencies and neighboring jurisdictions prior to establishing prohibitions of transportation corridors for commercial hazardous materials transport.
10. Provide, as resources allow, local information to the existing data management program within the Department of Ecology to develop and maintain an underground storage tank database for commercial underground storage tanks.
11. Coordinate the environmental review with other jurisdictions when a development proposal is within a designated wellhead protection area.
12. Participate in regional planning to address loss of domestic drinking water supply.
13. Incorporate requirements for enhanced protection of wellhead areas when stormwater drainage manuals and ordinances are revised.
14. Work together with other jurisdictions to coordinate educational programs to provide a basic wellhead protection message and work with community groups

and private parties to incorporate this message whenever possible.

15. Encourage the Thurston Conservation District Board and others to continue their voluntary efforts on education, conservation planning, and installation of best management practices on existing farms, golf courses, parks, schools and other facilities which use pesticides and fertilizers in designated wellhead protection areas.
16. Promote the use of integrated pest management, reduction of pesticide use, and reduction of fertilizer use by residents, businesses and other governmental agencies in designated wellhead protection areas.
17. Encourage interjurisdictional water resource management committees to consider wellhead protection during the development of their annual work programs.
18. Encourage the Ground Water Policy Advisory Committee and the Solid Waste Advisory Committee to discuss and coordinate activities and programs related to ground water protection and local hazardous waste management.

This plan recommends that the City Council and Public Works Committee consider the issue of mandatory septic tank testing or sewer line connection as an aquifer protection technique. It is also recommended that the City explore the implementation of a groundwater discharge permit system with the Thurston County Health Department as lead agency.

The Tumwater aquifer protection classification regime measures susceptibility to pollution in terms of vulnerability. Areas of high vulnerability will be protected by City ordinance through the creation of a new overlay zone called "Critical Areas - Aquifer Protection District". This new zone is to be geographically applied City-wide. In addition, a City ordinance will be created within the Tumwater Code, Section 16, Environment, which will have specific aquifer protection techniques to be applied City-wide.

The Critical Areas - Aquifer Protection District regulations specifically identify, classify and protect vulnerable aquifer recharge areas. The district has the following regulatory structure:

CRITICAL AREAS - AQUIFER PROTECTION ZONE DISTRICT

Intent:

The intent of the Critical Areas - Aquifer Protection Zone District (overlay zone district) is to identify, classify and protect vulnerable aquifer recharge areas within the City. Protection is to be accomplished by controlling the use and handling of hazardous substances. This district imposes additional restrictions on development in order to protect public health and safety by preserving the existing and future groundwater supply for the City. It is the intent of this district to protect vulnerable

aquifers from hazardous substance pollution by controlling or abating pollution from commercial and industrial sources and by preventing future pollution from new or different land uses or activities.

Scope and Applicability:

All property within the district shall be subject to the following restrictions, as well as the use, setback, and other controls of the zoning district in which it is presently located, and owners of property shall comply with the mandates of this chapter in addition to the zoning requirements of the district in which such property is presently or may later be located. In the event of conflict with the regulations of the underlying zoning district and the mandates of this district, the provisions of this district shall control.

Restricted Uses - Discharges and Disposal:

The following "high-risk" uses of land shall be restricted from locating within the boundaries of this district, unless such a use complies with the provision herein on new technologies and best management practices:

1. Chemical manufacture and reprocessing.
2. Creosote/asphalt manufacture or treatment.
3. Electroplating activities.
4. Manufacture of flammable or combustible liquids as defined in the current edition of the Fire Code.
5. Petroleum products refinery, including reprocessing.
6. Wood products preserving.
7. On and off-site hazardous waste treatment and storage facilities.

Improved Technology/Best Management Practices:

A restricted land use may be considered for location within the district only upon conclusive demonstration that application of new or improved technology or best management practice will result in no greater threat to the groundwater resources than that posed by a non-prohibited use. The approval procedure for location as a permitted use shall be by Conditional Use Permit, as set forth in Section 18.56 of this chapter.

The City-wide Aquifer Protection Ordinance will have the following regulatory structure:

Intent:

It is the declared policy of the City of Tumwater to conserve and protect the

underground waters and aquifers over which the City rests. Any development which occurs within the City will be designed to eliminate chemical and biological contaminants from entering underground waters and aquifers which are now, or in the future, likely to be used as a potable drinking water source.

Aquifer Protection Techniques:

The following aquifer protection techniques will be applied on a City-wide basis for new development construction:

1. **Stormwater Retention Facilities**

   New stormwater retention facilities serving ten or more single family residences, multiple family residences with four or more living units, and all commercial/industrial land uses must cleanse the stormwater of chemical and biological pollutants. The contaminant catch load must be dealt with in a way to prevent its entry into the groundwater system. Specific performance standards for stormwater cleansing and groundwater contaminant shielding to be established by the Public Works Director on an interim basis and subsequently identified by the City's Development Standards process by no later than one year past the date of Department of Ecology's final rules on stormwater.

2. **Facilities with Underground Tanks/Underground Storage Vaults**

   All new underground storage facilities used or to be used for the underground storage of hazardous substances shall be designed and constructed so as to:

   a. Prevent releases due to corrosion or structural failure for the operational life of the tank or vault;
   b. Be cathodically protected against corrosion, constructed of non-corrosive material, steel clad with a noncorrosive material, or designed in a manner to prevent the release or threatened release of any stored substance;
   c. Use material in the construction or lining of the tank which is compatible with the substance to be stored;
   d. Provide for release detection method(s); and
   e. Have double walls or single walls with liners.

3. **Facilities with Aboveground Tanks/New Aboveground Tanks**

   a. No new aboveground storage facility or part thereof shall be fabricated, constructed, installed, used, or maintained in any manner which may allow the release of a hazardous substance to the ground, groundwaters,

or surface waters.

b. No new aboveground tank or part thereof shall be fabricated, constructed, installed, used, or maintained without having constructed around and under it an impervious containment area enclosing or underlying the tank or part thereof. Impervious containment should be equal to the volume of the tank to avoid an overflow of the containment area.

4. **Modification of Performance Standards**

Projects that are located outside of the Aquifer Protection Zone District (TMC Title 18) may be granted reductions in the above-specified performance standards by the submittal and approval of an aquifer protection plan. This plan will outline how the project proposal will effectively protect the aquifer from releases of contaminants. This plan will also be made a part of the environmental review as outlined in the City's Environmental Policy Code (TMC Title 16.04).

5. **Municipal Well Protection**

Computer modeling and mapping has been completed designating the one, five, and ten year groundwater time of travel for existing well heads in Tumwater. Chapter 16.26 should be referred to for uses that fall within these areas.

3. FREQUENTLY FLOODED AREAS

3.1 Introduction

Protection of life and property during floods is a vital part of Tumwater's responsibility to public safety. Many of Tumwater's rivers, streams, and lakes are subject to flooding during periods of heavy rainfall.

Tumwater has had extensive research and study completed regarding frequently flooded areas within the City. Since August of 1980, Tumwater has participated in the National Flood Insurance Program, as authorized by the National Flood Insurance Act of 1968.

In order to be eligible for the program, hydrologic and hydraulic analyses were performed by the U.S. Geological Survey, for the Federal Emergency Management Agency, as codified in Chapters 15.28 and 18.38 of the Tumwater Municipal Code.

3.2 Frequently Flooded Areas Classified

The State Growth Management Act (RCW 36.70A) requires cities and counties to classify frequently flooded areas based on the 100-year floodplain designations of the Federal Emergency Management Agency and the National Flood Insurance Program.

Tumwater will consider the following when designating and classifying frequently flooded areas:

- Effects of flooding on human health and safety, and to public facilities and services;

- Available documentation, including federal, state, and local laws, regulations, and programs, local studies and maps, and federal flood insurance programs;

- Future flow floodplain, defined as the channel of the stream and that portion of the adjoining floodplain that is necessary to contain and discharge the base flood flow at buildout without measurable increase in flood heights;

- The potential effects of tsunami, high tides with strong winds, sea level rise resulting from global climate change; and

- Greater surface runoff caused by increasing impervious surfaces.

3.3 Frequently Flooded Areas Concerns

Concerns about frequently flooded areas in Tumwater include:

- Heavy seasonal rains generally from November through March can cause sudden river and stream rises and out-of-bank flows; and

- Out-of-bank flows can cause damage to life, dwellings, and industrial, agricultural, and recreational facilities.

3.4 Frequently Flooded Areas Protection Techniques

Techniques that can be used to protect life and property in frequently flooded areas include use of a zoning overlay district(s) to:

- Limit or prohibit, as appropriate, encroachment in floodplains that could endanger life and property during periods of flooding; and

- Preserve the natural functions of floodplains to store, carry, and control flood waters.

3.5 Tumwater Frequently Flooded Areas Protection

Maps from the Federal Emergency Management Agency, as part of the National Flood Insurance Program (1984), clearly delineate frequently flooded areas. These maps were then used to designate the Floodplain Zone District overlay zone.

The Floodplains Overlay district is divided into three sub-districts:

1) FLOODWAY: Is the channel of a stream and adjacent land areas which are required to carry and the discharge of a flood event that has a one percent chance of being equaled or exceeded in any given year. The "floodway" is designated on Flood Boundary and Floodway Maps from the Federal Emergency Management Agency. The "floodway" is usually characterized by water moving with a definite velocity and current during a flood event and a difference in soil conditions or vegetative ground cover when compared to other portions of the flood plain.

2) FLOODPLAIN, one-hundred year: The one-hundred year floodplain is the areas outside of the floodway which are subject to a one percent or greater chance of flooding in any given year. These areas are identified as the A, AE, AH, AO, A1-30, or A99 Zones on the Flood Insurance Rate Maps produced by the Federal Emergency Management Agency. The "one-hundred year floodplain" is usually located within the lowlands adjoining the channel of a river, stream or watercourse, or ocean, lake, or other body of standing water,

3) FLOODPLAIN, five-hundred year: The five-hundred year flood is the area that is subject to a 0.2 percent or greater chance of flooding in any year. There areas are identified as the "B" and "X" zones on the Flood Insurance Rate Maps from the Federal Emergency Management Agency . The five-hundred year flood area is usually lowlands adjoining the channel of a river, stream or watercourse, or ocean, lake, or other body of standing water.

These flood areas have been accurately delineated based on hydrologic and hydraulic studies completed by the Federal Emergency Management Agency in April of 1984, and as subsequently revised and amended.

The methodology and detail of these studies is accepted as the best available. The Floodplain Zone District overlay has served Tumwater well in minimizing the undesirable impacts of flooding.

Chapters 15.28 and 18.38 of the Tumwater Municipal Code are in place and serve to designate frequently flooded areas. If allowed, any structures permitted in the designated flood areas are subject to strict development regulations. The existing regulations were put in place after careful study and fulfill the requirements of the Growth Management Act regarding designation, classification, and protection of frequently flooded areas.

4. GEOLOGICALLY-HAZARDOUS AREAS

4.1 Introduction

This plan defines geologically-hazardous areas as those which are susceptible to erosion, landslides, earthquake and other geological events which pose a threat to public safety. At issue is the proper design and location of commercial, residential and industrial development to remove or reduce incompatibility with underlying geology. This goal of land use and geological harmony can be best pursued by appropriate engineering, design, or construction.

It must also be recognized that even the best of efforts in proper design and application of technology, at times, will not adequately reduce the risks of geological damage. In these instances, this plan proposes that building in such extreme geologically-hazardous areas is to be avoided.

4.2 Geologically-Hazardous Areas Classified

Areas in Tumwater that are prone to one or more of the following hazards are defined as geologically-hazardous:

- Erosion
- Landslides
- Earthquakes
- Volcanic hazards (slight risk)
- Tsunami Hazard (slight risk)
- Other geologic events, including mass wasting, debris flows, rock falls, and differential settlement

This plan will identify areas with the above-described hazards and subsequently classify all areas within Tumwater in one of three categories:

1) Known or suspected risk
2) No risk
3) Risk unknown (because of lack of information)

4.3 Geologically-Hazardous Areas Identified

The identification methodology upon which this plan relies to define geologically-hazardous areas are as follows:

Erosion - Identified by the United States Department of Agriculture Soil Conservation Service (USDA-SCS) as those areas having a “moderate to severe”, "severe" and “very severe” rill and inter-rill erosion hazard.

Landslides - Identified as those areas susceptible due to combinations of bedrock, soil, slope gradient, slope aspect, hydrology and other identified factors. Examples of these areas are:

A. Areas of historic failures

- USDA-SCS classified as "severe" limitation for building development;
- Areas mapped as unstable (u), unstable old slides (uos), unstable recent slides (urs), by the Department of Ecology coastal zone atlas;
- Areas designated as quaternary slumps, earthflows, mudflows, lahars or landslides on maps published by the United States Geological Survey or Department of Natural Resources.

B. Areas with all three of the following characteristics

- Slopes steeper than 15%;
- Hillsides intersecting geologic contacts of a relatively permeable sediment overlying a relatively impermeable sediment or bedrock;
- Springs or groundwater seepage.

C. Areas which have shown movement over the last 10,000 years or which are underlain or covered by mass wastage debris from this time period.

D. Slopes that are parallel to planes of weakness in sub-surface materials such as:

- Bedding planes
- Fault planes

E. Slopes with 80% or steeper gradients subject to rockfall during earthquakes.

F. Areas unstable as a result of stream incision, stream bank erosion, and undercutting by wave action.

G. Areas at risk from snow avalanches.

H. Areas located in a canyon or on an active alluvial fan, presently or potentially subject to inundation by debris or catastrophic flooding.

I. Slopes of 40% or steeper with a vertical relief of ten or more feet except areas composed of consolidated rock.

Earthquake - Earthquake hazard areas are those which are subject to severe risk of damage as a result of shaking, slope failure, settlement, soil liquefaction, or surface

faulting. Within Washington State the historic damage inducement has been ground shaking which results in settlement and soil liquefaction. The amount of ground shaking is affected by earthquake magnitude, distance from the earthquake epicenter, type and thickness of surface geologic materials, and sub-surface geologic structure.

4.4 Tumwater Geologically-Hazardous Areas

Erosion (Known or Suspected Risk Category) - The two major soil groupings within Tumwater are the Alderwood-Everett and Spanaway-Nisqually series. None of these soil types are identified as having severe erosion hazard characteristics when undisturbed.

Landslides (Known or Suspected Risk Category) - Known risk factors measuring probability of landslides are as follows:

- No areas within Tumwater are identified in the Department of Ecology Coastal Zone Atlas as landslide areas influenced by marine action.

- The major soil groupings for Tumwater (Alderwood-Everett, Spanaway-Nisqually) are identified by the Soil Conservation Service as having limitations for building development as follows:

LANDSLIDE/SLOPE STABILITY

Soil Name	Dwellings w/o Basements	Dwellings w/ Basements	Small Commercial
Alderwood	Severe limitation	Severe limitation	Severe limitation
Everett	Severe limitation	Severe limitation	Severe limitation
Spanaway	No limitation	No limitation	Severe limitation
Nisqually	No limitation	No limitation	Severe limitation

- Areas of slope over 15% and groundwater seepage exist on Tumwater Hill, the DesChutes river valley slopes, and Bush Mountain.

Earthquakes (Known or Suspected Risk Category) - Tumwater is identified in the International Building Code (IBC) as being located within the Zone D (Zone A - lowest, Zone E - highest) seismic zone map of the United States. This is a high-risk area for earthquakes and IBC standards for building construction set out stringent structural performance standards.

Volcanic Hazards (No Risk Category) - Discussions with the State Geologist indicate that Tumwater is not in a Volcanic Hazard zone, and only ashfall could be expected to visit the area.

4.5 Development Within Tumwater's Geologically-Hazardous Areas

Based upon the previous review of geologically-hazardous areas existing within Tumwater, the development regulations are appropriate to safeguard future construction in earthquake and landslide prone areas. Chapter 16.20 Geologically Hazardous Areas, sets forth standards for construction in areas identified as susceptible to earthquake and landslide conditions.

Intent:

It is the declared policy of the City of Tumwater to encourage land use that is compatible with underlying geological conditions through the use of appropriate engineering, design and construction practices. It is also recognized that at times even the best of efforts to properly design and apply technology will not adequately reduce the risks of geological hazards. In these instances, areas of extreme geological instability are to be avoided as sites for development and placement of structures.

Geologically-Hazardous Areas Development Requirements:

1) A critical areas report for geologically hazardous areas shall be prepared by a geotechnical engineer or geologist, licensed in the state of Washington, with experience analyzing geologic, hydrologic, and ground water flow systems; or by a geologist who earns his or her livelihood from the field of geology and/or geotechnical analysis, with experience analyzing geologic, hydrologic, and ground water flow systems, who has experience preparing reports for the relevant type of hazard.

2) The project area of the proposed activity and all geologically hazardous areas within 200 feet of the project area shall be addressed in a critical area report for geologically hazardous areas.

3) Geotechnical Assessment. A critical areas report for a geologically hazardous area shall contain an assessment of the geological hazards including the following site and proposal related information at a minimum:
   - The type and extent of geologic hazard areas, and any other critical areas and buffers on, adjacent to, or within 200 feet of the proposal;
   - Proposed development, including location of existing and proposed structures, fill, storage of materials, drainage facilities, with dimensions indicating distances to the floodplain;
   - Topography, in two foot contours, of the project area and all hazard areas addressed in the report; and
   - Clearing limits.

4) Assessment of geotechnical characteristics. The report shall include an

assessment of the geologic characteristics and engineering properties of the soils, sediments, and/or rock of the project area and potentially affected adjacent properties, and a review of the site history regarding landslides, erosion, and prior grading. Soils analysis shall be accomplished in accordance with accepted soil engineering practices. The assessment shall include, but not be limited to:

- A description of the surface and subsurface geology, hydrology, soils, and vegetation found in the project area and in all hazard areas addressed in the report;
- A detailed overview of the field investigations, published data and references; data and conclusions from past assessments of the site; and site specific measurements, test, investigations, or studies that support the identification of geologically hazardous areas; and
- A description of the vulnerability of the site to seismic and other geologic events.

5) Analysis of proposal. The report shall contain a geotechnical analysis including a detailed description of the project, its relationship to geologic hazard(s) and its potential impact upon the hazard area, the subject property and affected adjacent properties; and

6) Minimum buffer and building setback. The report shall make a recommendation for the minimum no-disturbance buffer and minimum building setback from any geologic hazard based upon the geotechnical analysis.

5. FISH AND WILDLIFE HABITAT CONSERVATION AREAS

5.1 Introduction

Preservation of fish and wildlife habitat is critical to the protection of suitable environments for animal species and in providing a natural beauty and healthy quality of life for Tumwater and its citizens. The conservation of habitat means active land management for maintaining species within their preferred habitats and accustomed geographic distribution. In this way, isolated sub-populations are not created which are more susceptible to predation, dislocation and inadequate food supplies. Habitat protection does not require that all individuals of all species are protected, but does demand that land use planning be sensitive to the priority of saving and protecting animal-rich environments.

5.2 Fish and Wildlife Habitat Classified

The State Growth Management Act (RCW 36.70A) requires cities and counties to classify seasonal ranges and habitats which are critical to the survival of endangered, threatened and sensitive species. Within Tumwater, habitats and species will be identified which are of local importance.

A listing of the types of fish and wildlife habitat areas to be protected by state-mandate are:

- Areas with which endangered, threatened and sensitive species have a primary association;
- Habitats and species of local importance;
- Commercial and recreational shellfish areas;
- Kelp and eelgrass beds; herring and smelt spawning areas;
- Naturally occurring ponds under twenty acres and their submerged aquatic beds that provide fish or wildlife habitat;
- Waters of the state (WAC 222);
- Lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity; or
- State natural area preserves and natural resource conservation areas.

- Areas of rare plant species and high quality ecosystems as identified by the Washington State Department of Natural Resources through the Natural Heritage Program;

- All areas within Tumwater meeting one or more of the criteria in this section, regardless of any formal identification, are subject to the provisions of this Title and shall be managed consistent with the best available science, such as the Washington Department of Fish and Wildlife's Management Recommendations for Priority Habitat and Species.

5.3 Fish and Wildlife Habitat Protection Techniques

After classifying and designating fish and wildlife areas in Tumwater, the following protection techniques will be pursued
when appropriate:

- Creating a system of fish and wildlife habitat with connections between larger habitat blocks and open spaces;

- Limiting the level of human activity in such areas including presence of roads and level of recreation type (after site specific analysis and planning passive or active recreation may be appropriate for certain areas and habitats);

- Protecting riparian ecosystems;

- Evaluating land uses surrounding ponds and fish and wildlife habitat areas that may negatively impact these areas;

- Establishing buffer zones around these areas to separate incompatible uses from habitat areas; and

- Restoration of lost salmonid habitat.

5.4 Tumwater Fish and Wildlife Habitat Identified

A review of State and local records and studies on habitats and species indicates that the following habitat categories exist within the City:

1) Areas with which endangered, threatened and sensitive species have a primary association;

2) Naturally occurring ponds under twenty acres with submerged aquatic beds that provide general fish and wildlife habitat;

3) Waters of the State (WAC 222); and

4) Lakes, ponds, streams and rivers planted with game fish by a governmental or tribal entity.

These four habitat categories are further defined as follows:

1) Seasonal ranges and habitats with which federal and state- listed endangered, threatened and sensitive species have a primary association and which, if altered, may reduce the likelihood that the species will maintain and reproduce over the long term.

2) Naturally occurring ponds under twenty acres and their submerged aquatic beds that provide fish or wildlife habitat.

   Naturally occurring ponds do not include ponds deliberately designed and created from dry sites, such as canals, detention facilities, wastewater treatment facilities, farm ponds, temporary construction ponds (of less than three years duration) and landscape amenities. However, naturally occurring ponds may include those artificial ponds intentionally created from dry areas in order to mitigate conversion of ponds, if permitted by a regulatory authority.

3) Waters of the State. Waters of the State are defined in Title 222 WAC, the forest practices rules and regulations. Tumwater will use the classification system established in WAC 222-16-030 to classify waters of the State.

   The following factors are considered when classifying waters of the State as fish and wildlife habitats:

   A) Species present which are endangered, threatened, or sensitive, and other species of concern;
   B) Species present which are sensitive to habitat manipulation;
   C) Historic presence of priority species;
   D) Existing surrounding land uses that are incompatible with salmonid habitat;
   E) Presence and size of riparian ecosystems;
   F) Existing water rights; and
   G) The intermittent nature of some of the higher classes of waters of the State.

4) Lakes, ponds, streams, and rivers planted with game fish.

   This includes game fish planted in these water bodies under the auspices of a

federal, state, local, or tribal program or which supports priority fish species as identified by the Department of Wildlife.

5.5 Tumwater Sensitive Species Identified

The Department of Fish and Wildlife maintains a listing of the priority habitats and species (PHS) for the City of Tumwater. This database is the reference document to be used by the City in the protection of habitats and species identified within the City.

5.6 Tumwater Fish and Wildlife Habitat Protection

Given Tumwater's diversity of fish and wildlife habitats in terms of geographic location, biological sensitivity, species hierarchy and current/future adjacent land uses, this plan proposes a regulation and protection process based upon performance standards to be applied to site specific development.

These performance standards are to be implemented on site-specific projects through TMC 16.38 and concomitant development permits.

Habitats Defined and Protected:

- Fish and wildlife habitats protected as per subsection 5.4 (To include the Deschutes River, Percival Creek, Black Lake drainage ditch, Barnes Lake, Trosper Lake, Fishpond Creek and their associated wetlands.)

- Habitats and species as identified by the Washington State Department of Fish and Wildlife's "Priority Habitats and Species Project Documents", including future revisions thereof, for the Tumwater area.

Habitat Areas - Buffers:

To retain and protect adequate urban wildlife habitats, buffers will be established on a case-by-case basis to be defined by a habitat protection plan.

Riparian Areas – Buffers:

Recommended riparian habitat area widths are shown in the table below. A riparian habitat shall have the width recommended, unless a greater width is required pursuant to 16.32.065 (A), or a lesser width is allowed pursuant to 16.32.065 (B). Widths shall be measured outward in each direction, from the ordinary high water mark or the top of the bank if the ordinary high water mark cannot be identified. Riparian areas should be sufficiently wide to achieve the full range of riparian and aquatic ecosystem functions. Such functions include but are not limited to protection of instream fish habitat through control of temperature

and sedimentation in streams; preservation of fish and wildlife habitat; and connection of riparian habitat to other habitats.

Riparian Habitat Areas	
Stream Type	**Recommended RHA Widths**
Type 1 and 2; or shorelines of the state, or shorelines of statewide significance	250 feet
Type 3; or other perennial or fish bearing streams,	200 feet
Type 4 and 5; streams draining directly to Puget Sound or to upstream from fish bearing streams	100 feet
Type 4 and 5; streams not draining to fish bearing streams or Puget Sound	50 feet

Habitat Areas - Allowed Uses and Activities:

Uses within protected habitat areas limited to low intensity land uses designed not to adversely affect the habitat. These uses will be:

Boat ramps
Docks (on lakes and ponds)
Stormwater facilities
Trails
Utility facilities
Clearing and Grading
Shoreline erosion control
Stream bank stabilization
Road, trails, and bridges
In-stream structures
On-site sewage systems and wells

Habitat Areas - Protection Plan:

When a protected habitat is located on a site to be developed, a Habitat Protection Plan will be submitted by the permit applicant. The Habitat Protection Plan shall contain the following information as a minimum and will be subsequently used as part of the Environmental Review and Discretionary Permit review process:

A report developed by a qualified professional expert, as defined in WAC 365-195-905 (4), which contains:

1. A description of the nature, density and intensity of the proposed development in sufficient detail to allow analysis of such land use change upon identified fish or wildlife habitat.

2. The applicant's analysis of the effect of the proposed development, activity or land use change upon the fish and/or wildlife species.

3. A plan by the applicant which shall explain how any adverse impacts to fish or wildlife habitats created by the proposed development will be mitigated.

A map(s) prepared at an easily readable scale, showing:

1. The location of the proposed development site.

2. The relationship of the development to the adjacent habitat area.

3. The nature and density of the proposed development or land use change.

4. Proposed building locations and arrangements.

5. A legend which includes:
   A) A complete and accurate legal description as prescribed by the development application form. The description shall include the total acreage of the parcel.
   B) Title, scale and north arrows; and
   C) Date, including revision dates if applicable.

6. Existing structures and landscape features including the name and location of all water courses, ponds and other bodies of water.

Possible mitigation measures shall include, but are not limited to:
   A. Establishment of buffer zones;
   B. Buffer zone enhancement by planting indigenous plant species;
   C. Preservation of critically important plants and trees;
   D. Limitation of access to habitat area;
   E. Seasonal restriction of construction activities.