

## **TITLE 18D**

### **DEVELOPMENT REGULATIONS CRITICAL AREAS AND NATURAL RESOURCE LANDS**

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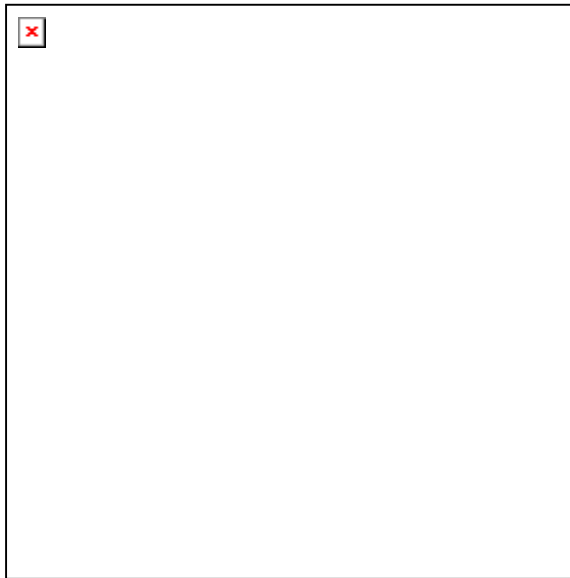
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## Chapter 18D.10

### GENERAL PROVISIONS

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**18D.10.010 Authority.** This Title is established and adopted pursuant to:

- A. Environmental policies and procedures for this Title are established pursuant to [RCW 43.21C](#), as amended and entitled the, “State Environmental Policy Act” (SEPA), and [WAC 197-11](#), as amended and entitled, “State Environmental Policy Act Rules”; and
- B. The City adopts by reference [WAC 197-11-300 through WAC 197-11-800](#); and
- C. Adoption Of Designations Of Shorelands And Wetlands Associated With Shorelines Of The State [173-22 WAC](#); and
- D. Flood Plain Management [86.16 RCW](#); and
- E. The Growth Management Act [36.70A.060 RCW](#); and
- F. Critical areas – Designation and protection [36.70A.172 RCW](#);
- G. Application of Best Available Science (BAS) pursuant to [36.70A.172\(1\) RCW](#) and [WAC 365-195-900](#) et seq.
- H. Application of rules for smaller jurisdictions for extensive original research of BAS pursuant to [WAC 365-195-060\(4\)](#).
- I. The Joint City of Tenino & Thurston County [Comprehensive Growth Management Plan](#), 2004 Edition, adopted November 23, 2004.

**18D.10.020 Repeal.** The current Tenino Municipal Code (TMC), Chapter 18.60 – Interim Resource and Critical Areas Protection is hereby repealed in entirety and replaced with this Title. Repeal of TMC Chapter 18.60 does not affect any existing permits, land use applications or requirements, or existing enforcement actions.

**18D.10.025 Title.** This Title shall be known as Tenino Municipal Code (TMC) Title 18D - Critical Areas and Natural Resource Lands Development Regulations.

**18D.10.030 Intent.** This Chapter:

- A. Identifies critical areas as defined by [RCW 36.70A.030](#) to include wetlands; critical aquifer recharge areas; frequently flooded areas; geologically hazardous areas (i.e., erosion, landslide, seismic, and volcanic hazard areas); and streams, and fish and wildlife habitat areas. All of these critical areas are of special concern to the people of Tenino and the State of Washington.
- B. Identifies and provides regulatory measures to protect critical areas of Tenino from land uses and development that are incompatible with critical areas and establish minimum standards for development of sites, which contain or are adjacent to identified critical areas, to promote the public health, safety and welfare by:
  - 1. Avoiding impacts to critical areas;
  - 2. Mitigating unavoidable impacts by regulating development;
  - 3. Protecting critical areas from impacts of development;
  - 4. Protecting the public against losses from:
    - a. Costs of public emergency rescue and relief operations where the causes are avoidable; and
    - b. Degradation of the natural environment and the expense associated with repair or replacement;
- C. Protects water availability, water quality, wetlands, and streams through mitigation measures of potentially adverse impacts;
- D. Protects unique, fragile, and valuable elements of the environment, including critical fish and wildlife habitat;

- E. Providing Department staff with sufficient information to adequately apply protection to critical areas and proposed development when approving, conditioning, or denying public or private development proposals;
- F. To protect the public from threats to human safety and to protect public and private property from natural hazards by providing sufficient information and notice of potential risks associated with development in natural hazard critical areas; and
- G. Implements the goals and requirements of the Growth Management Act, the State Environmental Policy Act, the City of Tenino Comprehensive Plan, and all updates and amendments, functional plans, and other land use policies formally adopted or accepted by the City of Tenino.
- H. To meet the goals of the GMA to protect the environment and enhance the state's quality of life. To preserve those environmentally sensitive areas that are valuable to the public and provide ecological function.
- I. This Title also consolidates procedures and regulations that shall promote compatibility between the natural and built environment within the City of Tenino. Chapters within this Title detail the procedures for activities related to critical areas and natural resource lands.

**18D.10.040 Interpretation.** In the interpretation and application of this Title, all provisions shall be:

- A. Considered the minimum necessary;
- B. Liberally construed to serve the purposes of this Title; and
- C. Deemed neither to limit nor repeal any other powers under State statute.

**18D.10.050 Applicability and Mapping.**

- A. This Title shall apply to all lands and waters within the City of Tenino that are designated as critical areas.
- B. No development (see TMC 18.20.070 definition "Development") shall hereafter be affected without full compliance with the application of this Title.
- C. When the requirements of this Title are more stringent than those of other Tenino municipal codes and regulations, including Building Codes as adopted pursuant to [RCW 19.27-State Building Code](#), the requirements of this Title shall apply.
- D. Compliance with these regulations does not remove an applicant's obligation to comply with applicable provisions of any other Federal, State, or local law or regulation.
- E. Criteria for determining critical areas is contained within each Chapter of this Title.
- F. When a site contains more than one critical area, the site shall meet the minimum standards and requirements for each identified critical area as set forth in this Title.
- G. Critical areas, as defined and regulated by this Title, are identified, but not limited to the following Critical Areas Maps:
  - 1. [Wetland Inventory map](#);
  - 2. Landslide Hazard Area map;
  - 3. [Seismic Hazard Area map](#);
  - 4. [Liquefaction Site Class map](#);
  - 5. Volcanic Hazard Area Maps;
  - 6. [Critical Aquifer Recharge Area and Wellhead Protection Areas map](#);
  - 7. Fish and Wildlife Habitat maps;
  - 8. Stream Typing Area maps;
  - 9. [WRIA 23 maps](#);

10. Flood Hazard Area maps;
  11. Resource Lands maps;
  12. Soils maps; and
  13. [FIRM \(Flood Insurance Rate Maps\) maps.](#)
- H. The exact boundary of each critical area depicted on the Critical Areas maps are approximate and are only intended to provide an indication of the presence of a critical area on a particular site. The mapping sources above are not an exhaustive list of maps that may be available and should be considered as informational or for illustrative purposes only unless the map is an integral component of a regulatory scheme or study. Additional critical areas that have not been mapped may be present on a site. The actual presence of a critical area, or areas and the applicability of these regulations shall be determined based upon the classification or categorization criteria and review procedures established for each critical area. City staff and/or consultant(s) may conduct on-site inspections to assess the site in order to determine if additional studies or reports identified in this Title are necessary. An inspection report of findings shall be written after the on-site inspection and will become a part of any site development application as a future reference.
- I. Critical Areas maps are updated as areas are studied. Mapping information is maintained by the City of Tenino and provided to the [Thurston Regional Planning Council GIS Department](#) and the [Thurston County GIS Department](#).
- J. Development of the City's Critical Areas maps are derived from the sources listed in 18D.10.150 Appendix A. These sources may be updated from time to time and will result in a correlating update to the applicable Critical Areas maps.

#### **18D.10.060 Definitions.**

- A. This Title shall rely on the definitions contained in TMC 18.20.040, Definitions. Tenino also adopts by reference the definitions stated in [WAC 197-11-700 through 197-11-799](#) as now, or hereafter amended. In addition, the definitions in 18D.10.060B below are also adopted:
- B. Additional definitions that apply to this Title are:
- ABUTTING. Bordering upon, to touch upon, in physical contact with. Sites are considered abutting even though the area of contact may be only a point.
- ACT. See State Environmental Policy Act.
- ACTIONS. Include, as further specified below:
1. New and continuing activities (including projects and programs) entirely or partly financed, assisted, conducted, regulated, licensed, or approved by agencies;
  2. New or revised agency rules, regulations, plans, policies, or procedures; and Legislative proposals. Actions fall within one of two categories:
    - a. **Project** actions - Involves a decision on a specific project, such as a construction or management activity located in a defined geographic area. Projects include and are limited to agency decisions to:
      - (1) License, fund, or undertake any activity that will directly modify the environment, whether the activity will be conducted by the agency, an applicant, or under contract;
      - (2) Purchase, sell, lease, transfer, or exchange natural resources, including publicly owned land, whether or not the environment is directly modified.
    - b. **Nonproject** actions - Involve decisions on policies, plans, or programs.
      - (1) The adoption or amendment of legislation, ordinances, rules, or regulations that contain standards controlling use or modification of the environment;

- (2) The adoption or amendment of comprehensive land use plans or zoning ordinances;
- (3) The adoption of any policy, plan, or program that will govern the development of a series of connected actions (WAC 197-11-060), but not including any policy, plan, or program for which approval must be obtained from any Federal agency prior to implementation;
- (4) Creation of a district or annexations to any city, town or district;
- (5) Capital budgets; and
- (6) Road, street, and highway plans.

Actions do not include the activities listed above when an agency is not involved, or include bringing judicial or administrative civil or criminal enforcement actions (Categorical exemptions in [WAC 197-11-800](#) identify in more detail governmental activities that would not have any environmental impacts and for which SEPA review is not required).

**ACTIVITY.** Any use conducted on a site.

**ADDITION.** An alteration to an existing structure that increases the floor area. There are two types of additions: additions affixed to the side of an existing structure and an upper story addition.

**ADJACENT.** Within 500 feet from the exterior boundaries of designated resource lands pursuant to [RCW 36.70A.060](#).

**ADDENDUM.** An environmental document used to provide additional information or analysis that does not substantially change the analysis of significant impacts and alternatives in the existing environmental document. The term does not include supplemental EISs. An addendum may be used at any time during the SEPA process.

**AGGRIEVED PERSON.** The project sponsor, or any person affected by the proposal.

**AGRICULTURAL ACTIVITIES, EXISTING AND ONGOING.** Those activities involved in the production of crops or livestock, for example, the operation and maintenance of farm and stock ponds or drainage ditches, operation and maintenance of ditches, irrigation systems including irrigation laterals, canals, or irrigation drainage ditches, changes between agricultural activities, and normal maintenance, repair, or operation of existing serviceable structures, facilities, or improved areas and cyclical operations and managed periods of soil restoration, enhancement or other fallow states associated with these horticultural and agricultural activities, and the practice of aquaculture. Forest practices regulated under [RCW 76.09](#) and [WAC 222](#), are not included in this definition.

**NOTE:** Activities which bring an area into agricultural use are not part of an ongoing operation. An operation ceases to be ongoing when the area on which it is conducted is proposed for conversion to a nonagricultural use or has lain idle for more than five years, unless the idle land is registered in a federal or state soils conservation program, or unless the activity is maintenance of irrigation ditches, laterals, canals, or drainage ditches related to an existing and ongoing agricultural activity. Forest practices are not included in this definition.

**AGRICULTURAL LANDS.** Land primarily devoted to the commercial production of horticultural, viticultural, floricultural, dairy, apiary, vegetable, or animal products or of berries, grain, hay, straw, turf, seed, Christmas trees not subject to the excise tax imposed by [RCW 84.33.100 through 84.33.140](#), finfish in upland hatcheries, or livestock, and that has long-term commercial significance for agricultural production.

**ALLUVIAL GEOLOGIC UNIT.** Geologically recent stream, lake, swamp, and beach deposits of gravel, sand, silt, and peat.

**ALTERATION.** Any change to, addition to, or modification of an existing use or physical structure that is beyond routine repair and maintenance but does not amount to total replacement. An alteration includes activity that requires a building permit.

**ANIMAL CONTAINMENT AREA.** A site where two or more animal units of large animals per acre or .75 of an animal unit of small animals per acre are kept, and where a high volume of waste material is deposited in quantities capable of impacting groundwater resources.

**ANIMAL UNIT.** Defined as one thousand pounds of live weight of any given livestock species or any combination of livestock species. Animal equivalents are calculated for each livestock and poultry sector according to estimated rates of manure production for each species. Common examples of livestock species include, but are not limited to, cattle (beef and dairy), horses, goats, pigs, and llamas. For additional information, refer to the U.S. Department of Agriculture Natural Resource Conservation Service Animal Waste Field Handbook.

**APPLICANT.** Any person or entity, including an agency, applying for a license from an agency (Application means a request for a license or review of an action by the City for consideration of approval).

**AQUIFER.** A geological formation, group of formations or part of formation this is capable of yielding a significant amount of water to a well or spring.

**AQUIFER RECHARGE AREA.** Areas that have a critical recharging effect on groundwater used for potable water supplies and/or that demonstrate a high level of susceptibility or vulnerability to groundwater contamination from land use activities. Examples of aquifer recharge areas include:

1. Wellhead protection areas delineated pursuant to the Federal Safe Drinking Water Act; and
2. Other areas with a high level of susceptibility or vulnerability to contamination as demonstrated through the use of the DRASTIC Model.

**BASE FLOOD.** The flood having a one (1%) percent chance of being equaled or exceeded in any given year, also referred to as the "100-year flood."

**BEST AVAILABLE SCIENCE.** Defined by [WAC 365-195-905](#) for determining which information is the "best available science".

**BEST AVAILABLE TECHNOLOGY.** The technology that provides the greatest degree of protection to the natural resource, taking into consideration processes that are developed, or could feasibly be developed given overall reasonable expenditures on research and development, and processes that are currently in use. In determining what best available technology is, the local government shall consider the effectiveness, engineering feasibility and commercial availability of the technology.

**BEST MANAGEMENT PLAN.** A plan developed for a property, which specifies best management practices for the control of animal wastes, stormwater runoff, and erosion.

**BUFFER.** The naturally existing area contiguous with a critical area that is required for the integrity, maintenance, function, and structural stability and to preserve or enhance the existing functions and values of such critical area.

**BUFFER AREA.** The necessary area established by determination of a critical area evaluation process required to preserve the functions and values of the associated critical area. Where the buffer area crosses the built environment, that area ceases to be a buffer and becomes instead a "management zone" (see Management Zone).

**BUILDING FOOTPRINT.** The horizontal area measured within the outside of the exterior walls of the ground floor of all principal and accessory buildings on a lot.

**BUILT ENVIRONMENT.** Any of the elements as defined by WAC 197-11-444(2).



CAVE. A natural subterranean chamber greater than one foot in diameter and greater than three feet deep.

CITY. Means the City of Tenino.

CLASS. One of the wetland classes in the United States Fish and Wildlife Service (USFWS) December 1979 publication, Classification of Wetlands and Deep Water Habitats of the United States.

CLASSIFICATION. Defining value and hazard categories to which critical areas and land resource lands will be assigned.

CLEARING. The removal of timber, brush, grass, ground cover, or other vegetative matter from a site, which exposes the earth's surface on the site.

CLIFF. A steep vertical or overhanging face of rock or earth greater than 25 feet in height.

COLLUVIUM. Materials deposited by gravity at the foot of a slope (e.g. talus, soil creep, etc.).

COMPENSATORY MITIGATION. Mitigation to compensate for loss of wetland habitat due to filling of wetlands or other regulated activities in wetlands.

CONE PENETRATION TEST (CPT). A method of testing soil compaction.

CONSERVATION EASEMENT. A recorded deed restriction or covenant that runs in perpetuity on a parcel of land restricting the use of the property by preventing future real estate development such as residential, industrial, or commercial use. Conservation easements may allow for continued current uses (e.g., residential, recreational, agriculture, forestry, or ranching); however, conservation easements most often restrict both the current use as well as future uses of the land to some important conservation quality such as habitat preservation, open space, or scenic views. A land trust or governmental entity that manages properties for long-term goals typically holds conservation easements.

CONTAMINANT. Any chemical, physical, biological, or radiological substance that does not occur naturally or occurs at concentrations and duration as to be injurious to human health or welfare or shown to be ecologically damaging.

COUNCIL. Means the City of Tenino City Council.

COUNTY. Means Thurston County.

CREATION. Producing or forming a wetland through artificial means from a non-wetland site.

CRAWL SPACE. The shallow space beneath the bottom floor of a house with no basement; used for access and inspection of framing, electrical, plumbing, insulation, vapor barriers, or duct work. For purposes of the National Flood Insurance Program Elevation Certificate, a crawl space that has subgrade around all sides shall be considered a basement.

CRITICAL AREAS. See TMC 18D.10.030.

CRITICAL FACILITIES. Those facilities occupied by populations or which handle dangerous substances including but not limited to hospitals, medical facilities; structures housing, supporting, or containing toxic or explosive substances; covered public assembly structures; school buildings through secondary, including day-care centers; buildings for colleges or adult education; jails and detention facilities; and all structures with occupancy of greater than 5,000 people.

DEBRIS FLOW. The rapid downslope movement of a viscous mass of water-saturated regolith.

DEGRADED. To have suffered a decrease in naturally occurring functions and values due to activities undertaken or managed by persons on or off a site.

DELINEATION. A wetland study conducted in accordance with the Washington State Wetlands Identification and Delineation Manual.

DELINEATION REPORT. See Wetland Report.

DEPARTMENT. See TMC 18.20.070 Definition, Department.

DEPRESSIONAL POTHOLE. A relatively sunken or low-lying area of the earth's surface, especially one having no natural outlet for surface drainage.

DESIGNATION. Taking formal legislative action to adopt classifications, inventories, and regulations.

DETERMINATION OF: As relating to SEPA.

1. Non-significance (*DNS*)
2. Mitigated Determination of Nonsignificance (*MDNS*)
3. Significance (*DS- EIS REQUIRED*)

DEVELOPMENT. See TMC 18.20.070 Definition - Development.

DEVELOPMENT ACTIVITY. See TMC 18.20.070 Definition - Development Activity.

DIRECTOR. The Director of Community Development Department or Designee.

DOWNED LOGS. Trees that have fallen or toppled which are dead or in the process of dying, and exhibit sufficient decay characteristics to enable use by fish or wildlife species as habitat. Also referred to as "large woody debris (LWD)".

DRASTIC. A groundwater quality model, which was developed by EPA in the 1980's for evaluating the pollution potential of large areas using the hydrogeologic settings of the region (Aller et al., 1985, Aller et al., 1987, Deichert et al., 1992). DRASTIC includes various hydrogeologic settings which influence the pollution potential of a region. A hydrogeologic setting is defined as a mappable unit with common hydrogeologic characteristics. This model employs a numerical ranking system that assigns relative weights to various parameters that help in the evaluation of relative groundwater vulnerability to contamination.

DWELLING UNIT. One or more rooms designed for or occupied by one family for living or sleeping purposes containing kitchen facilities for use solely by one family.

EARTH/EARTH MATERIAL. Naturally occurring rock, soil, stone, sediment, or combination thereof.

EARTHFLOW. A slow downslope movement in which saturated regolith sags downward in a series of irregular terraces.

ECOTONE. A transition area between two adjacent vegetation communities.

ENCROACHMENT. Any development or regulated activity conducted inside the boundaries of a designated critical area and/or its associated buffer.

ENGINEER. Defined by [RCW Chapter 18.43](#)

ENGINEERING GEOLOGIST. A geologist who, by reason of his or her knowledge of engineering geology, acquired by education and practical experience, is qualified to engage in the practice of engineering geology, has met the qualifications in engineering geology established under [RCW 18.220](#), and has been issued a license in engineering geology by the Washington State Geologist Licensing Board.

ENGINEERING GEOLOGY. A specialty of geology affecting the planning, design, operation, and maintenance of engineering works and other human activities where geological factors and conditions impact the public welfare or the safeguarding of life, health, property, and the environment.

ENHANCEMENT. Actions performed to improve the condition of existing degraded wetlands and/or buffers so that the quality of wetland functions increases (e.g., increasing plant diversity, increasing wildlife habitat, installing environmentally compatible erosion controls, removing non-indigenous plant or animal species, removing fill material or solid waste).

ENVIRONMENTAL DETERMINATION. That the responsible official or proponent has determined whether or not there are significant adverse effects on quality of the environment and if so, can they be mitigated.

ENVIRONMENTAL IMPACT STATEMENT (EIS) – Types: As related to SEPA.

1. Draft and final environmental impact statements (EISs) shall be prepared; draft and final supplemental EISs may be prepared.
2. A draft EIS (DEIS) allows the lead agency to consult with members of the public, affected tribes, and agencies with jurisdiction and with expertise. The lead agency shall issue a DEIS and consider comments as stated in Part Five.
3. A final EIS (FEIS) shall revise the DEIS as appropriate and respond to comments as required in [WAC 197-11-560](#). An FEIS shall respond to opposing views on significant adverse environmental impacts and reasonable alternatives which the lead agency determines were not adequately discussed in the DEIS. The lead agency shall issue an FEIS as specified by [WAC 197-11-460](#).
4. A supplemental EIS (SEIS) shall be prepared as an addition to either a draft or final statement if:
  - a. There are substantial changes to a proposal so that the proposal is likely to have significant adverse environmental impacts; or
  - b. There is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts.
  - c. A SEIS shall be prepared pursuant to [WAC 197-11-620](#).

ENVIRONMENTAL REVIEW. As related to SEPA. Means:

1. Preparation and review of an environmental checklist substantially in the form found in [WAC 197-11-960](#) to assist in making threshold determinations for proposals, except for:
  - a. Public proposals on which the lead agency has decided to prepare its own EIS; or
  - b. Proposals on which the lead agency and applicant agree an EIS will be prepared; or
  - c. Projects which are proposed as planned actions (see subsection (2)).
2. For projects submitted as planned actions under [WAC 197-11-164](#), a GMA city shall use the existing environmental checklist or modify the environmental checklist form to fulfill the purposes outlined in [WAC 197-11-172\(1\)](#), notwithstanding the requirements of [WAC 197-11-906\(4\)](#).
3. Agencies may use an environmental checklist whenever it would assist in their planning and decision making, but shall only require an applicant to prepare a checklist under SEPA if a checklist is required by subsection (1) of this section.
4. The lead agency shall prepare the checklist or require an applicant to prepare the checklist.
5. The items in the environmental checklist are not weighted. The mention of one or many adverse environmental impacts does not necessarily mean that the impacts are significant. Conversely, a probable significant adverse impact on the environment may result in the need for an EIS.
6. Also See, TMC Title 18C - State Environmental Policy Act (SEPA).

EROSION. The wearing away of the earth's surface as a result of the movement of wind, water, or ice.

EROSION HAZARD AREAS. Areas identified by the United States Department of Agriculture Soil Conservation Service as having a "severe" rill and inter-rill erosion hazard.

EXCAVATION. The mechanical removal of earth material.

EXPANSION. The alteration of a use or structure that extends beyond the existing use area or building footprint.

EXTIRPATION. The elimination of a species from a portion of its original geographic range.

FACILITY. All structures, contiguous land, appurtenances, and other improvements on the land used for recycling, reusing, reclaiming, transferring, storing, treating, disposing, or

otherwise handling a hazardous substance. Use of the term “facility” includes underground and aboveground tanks and operations, which handle, use, dispose of, or store hazardous substances.

**FILL MATERIAL.** A deposit of earth material placed by human or mechanical means.

**FILL/FILLING.** See TMC 18.20.090 Definition Fill/Filling.

**FINISHED FLOOR.** The top of the next higher floor above the lowest floor. For purposes of the National Flood Insurance Program Elevation Certificate, the finished floor referenced in this regulation shall equal the top of the next higher floor.

**FISH AND WILDLIFE HABITAT AREAS.** Those areas identified as being of critical importance to maintenance of fish, wildlife, and plant species, including: areas with which endangered, threatened, and sensitive species have a primary association; habitats and species of local importance; naturally occurring ponds under 20-acres and their submerged aquatic beds that provide fish or wildlife habitat; waters of the State; lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity, or private organization; State natural area preserves and natural resource conservation areas.

**FISHERIES BIOLOGIST.** A professional with a degree in fisheries or certification by the American Fisheries Society, or with five years professional experience as a fisheries biologist.

**FLOOD OR FLOODING.** A general and temporary condition of partial or complete inundation of normally dry land areas from:

1. The overflow of inland or tidal waters, and/or
2. The unusual and rapid accumulation of runoff of surface waters from any source.

**FLOODFRINGE.** The area subject to inundation by the base flood, but outside the limits of the floodway, and which may provide needed temporary storage capacity for floodwaters.

**FLOOD HAZARD AREAS.** Those verifiable areas of flooding identified in TMC 18.70.020 using:

1. Relevant and verifiable government and citizen photographs, notes, observations, etc. regarding historic ponding/flooding levels greater than three feet in depth; or
2. Relevant and verifiable information available through Thurston County; or
3. Relevant and verifiable information available through the Federal Emergency Management Agency (FEMA); or
4. Areas of land located in floodplains subject to a one (1%) percent or greater chance of flooding in any given year, including, but not limited to, streams, rivers, lakes, ponds, wetlands, depressional potholes and the like; or
5. Aerial photographs.

**FLOOD INSURANCE RATE MAP (FIRM).** The official map of a community on which the Federal Insurance Administration (FIA) Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community.

**FLOODPLAIN.** The total area subject to inundation by the base flood, including the floodfringe and the floodway areas.

**FLOODWAY.** The channel of a river or other watercourse, and the land areas that must be reserved in order to convey and discharge the base flood without cumulatively increasing the water surface elevation by more than one foot, and those areas designated as deep and/or fast-flowing water.

**FOUNDATION FOOTING SETBACK.** A typical geotechnical recommendation intended to assure that a proposed structure is protected in the event of a slope failure or sloughage. A foundation footing setback is measured horizontally from the face of the foundation footing to the face of the slope. A foundation footing setback for this purpose should not be

confused with a building or construction setback from a landslide hazard area buffer. A foundation footing setback is also not a buffer (see [Figure 18D.10-1](#)).

**GEOLOGICAL ASSESSMENT.** An assessment prepared by a professional engineer licensed by the State of Washington with expertise in geotechnical engineering or prepared by a licensed professional geologist, hydrologist, or soils scientist, as specified later in this Section, who has earned the related bachelor's degree from an accredited college or university, or equivalent educational training, and has five years experience assessing the relevant geologic hazard. A geological assessment must detail the surface and subsurface conditions of a site and delineate the areas of a property that might be subject to specified geologic hazards.

**GEOLOGICALLY HAZARDOUS AREAS.** Areas that because of their susceptibility to erosion, sliding, earthquake or other geological events are not suited to the siting of commercial, residential, or industrial development consistent with public health or safety concerns.

**GEOLOGIST.** An engineering geologist, or hydro-geologist, registered in the State of Washington.

**GEOTECHNICAL PROFESSIONAL.** A person with experience and training in analyzing, evaluating, and mitigating landslide, erosion, and/or seismic hazards. A geotechnical professional shall be licensed in the State of Washington as a geologist or professional engineer, and must have five or more years experience specializing in landslide, erosion, or seismic hazards, as applicable.

**GEOTECHNICAL REPORT.** A report prepared by a professional engineer licensed by the State of Washington with expertise in geotechnical engineering, evaluating the site conditions and mitigating measures necessary to reduce the risks associated with development in geologically hazardous areas.

**GRADING.** Any excavating, filling, clearing, or creating of impervious surfaces or combination thereof.

**GROUND APPLIFICATION.** An increase in the intensity of earthquake-induced ground shaking which occurs at a site whereby thick deposits of unconsolidated soil or surficial geologic materials are present.

**GROUNDWATER.** Water in a saturated zone or stratum beneath the surface of land or water.

**GROUND WATER MANAGEMENT AREA.** A specific geographic area or subarea designated pursuant to Chapter 173-100 WAC for which a ground water management program is required.

**GROUP "A" WATER SYSTEM.** As defined by [WAC 246-290-020](#). Generally, a water system:

1. With 15 or more service connections; or
2. A system that services an average of 25 or more people per day for 60 or more days within a calendar year.

**HABITAT ASSESSMENT.** A report prepared by a professional wildlife biologist or fisheries biologist, which identifies the presence of fish and wildlife habitat conservation areas near the proposed development site.

**HABITAT OF LOCAL IMPORTANCE.** An area, range, or habitat within which a species has a primary association and which, if altered, may reduce the likelihood that the species will maintain and reproduce over the long term. Examples include areas of high relative density or species richness, breeding habitat, winter range, and movement corridors. These areas may also include habitats that are of limited availability or high vulnerability to alteration.

**HABITAT MANAGEMENT PLAN.** A report prepared by a professional wildlife biologist or fisheries biologist, which discusses and evaluates the measures necessary to maintain fish and wildlife habitat conservation areas on a proposed development site.

**HABITAT EVALUATION.** A procedure for determining the abundance and quality of habitat features for a species or other taxonomic group (in this case, salmonid fishes) at or on a particular site or property.

**HABITAT EVALUATION REPORT PACKAGE.** The combined materials that compose a report on a habitat evaluation, including narrative on methods and findings, as well as maps and data in tabular and graphic form.

**HARD ARMORING.** The use of large rock and/or human-made materials to protect property from shoreline erosion. Such techniques include cement/concrete bulkheads, steel structures, rock wall revetments, and rock gabion structures. Hard armoring typically does not utilize or integrate any of soft armoring or soil bioengineering techniques.

**HAZARDOUS SUBSTANCE(S).** Any liquid, solid, gas, or sludge, including any material, substance, product, commodity, or waste, regardless of quantity, that exhibits any of the physical, chemical or biological properties described in Chapter [173-303-090](#) or [173-303-100](#) WAC.

**HAZARDOUS SUBSTANCE PROCESSING OR HANDLING.** The use, storage, manufacture, or other land use activity involving hazardous substances, but does not include individually packaged household consumer products or quantities of hazardous substances of less than five gallons in volume per container. Hazardous substances shall not be disposed on-site unless in compliance with Dangerous Waste Regulations, [WAC 173-303](#) and any pertinent local ordinances such as sewer discharge standards.

**HAZARDOUS WASTE.** Includes all dangerous waste and extremely hazardous waste as designated pursuant to [RCW 70.105](#) and [WAC 173-303](#).

1. **“Dangerous waste”** any discarded, useless, unwanted, or abandoned substances including but not limited to certain pesticides or any residues or containers of such substances which are disposed of in such quantity or concentrations as to pose a substantial present or potential hazard to human health, wildlife, or the environment because such wastes or constituents or combinations of such wastes:
  - a. Have short-lived, toxic properties that may cause death, injury, or illness, or have mutagenic, teratogenic, or carcinogenic properties; or
  - b. Are corrosive, explosive, flammable, or may generate pressure through decomposition or other means.
2. **“Extremely hazardous waste”** any waste which:
  - a. Will persist in a hazardous form for several years or more at a disposal site and which in its persistent form presents a significant environmental hazard and may be concentrated by living organisms through a food chain or may affect the genetic make-up of humans or wildlife; and
  - b. Is disposed of at a disposal site in such quantities as would present an extreme hazard to humans or the environment.

**HAZARDOUS WASTE TREATMENT AND STORAGE FACILITY.** A facility that treats and stores hazardous waste and is authorized pursuant to [RCW 70.105](#) and [WAC 173-303](#). It includes all contiguous land and structures used for recycling, reusing, reclaiming, transferring, storing, treating, or disposing of hazardous waste. Treatment includes using physical, chemical, or biological processing of hazardous wastes to make such waste non-dangerous or less dangerous and safer for transport, amenable for energy or material resource recovery. Storage includes the holding of waste for a temporary period, but not the



accumulation of waste on the site of generation as long as the storage complies with applicable requirements of WAC 173-303.

1. "Onsite treatment and storage facility" means a facility that treats or stores hazardous wastes generated on the same geographically contiguous property.
2. "Offsite treatment and storage facility" means a facility that treats or stores hazardous wastes generated on property other than those on which the offsite facility is located.

**HOLOCENE EPOCH.** That part of the geologic record that post-dates the youngest deposits associated with the late Pleistocene Age Fraser Glaciation.

**HYDROGEOLOGIC ASSESSMENT.** A report detailing the subsurface conditions, the design of a proposed land use action, and the facilities operation which indicates the susceptibility and potential for contamination of groundwater supplies.

**HYDROLOGICALLY CONNECTED.** A connection between two or more surface water bodies including, but not limited to, wetlands, streams or lakes as evidenced by:

1. The presence of surface water in a perennial or intermittent stream, through a culvert or otherwise above ground;
2. The presence of contiguous hydric soil; or
3. The location of a water body within or contiguous to a one hundred-year floodplain of a wetland, stream or lake.

**HYDROLOGICALLY ISOLATED WETLAND.** A wetland which:

1. Is not contiguous to any 100-year floodplain of a lake, river, or stream; and
2. Has no contiguous surface hydrology, hydric soil, or hydrophytic vegetation between the wetland and any other wetland or stream system.

**IMPERVIOUS SURFACE.** A hard surface, which prevents or retards the entry of water into the soil mantle as under natural conditions prior to development, and/or a hard surface area, which causes water to run off the surface in greater quantities or at an increased rate of flow than the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, roof tops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, gravel roads, gravel parking lots, packed earthen materials, and oiled, macadam or other surfaces which similarly impede the natural infiltration of stormwater. Open, uncovered retention/detention facilities shall not be considered as impervious surfaces.

**IN-KIND MITIGATION.** To replace wetlands with substitute wetlands whose characteristics and functions and values are intended to replicate those destroyed or degraded by a regulated activity.

**INTERSPERSION BETWEEN WETLAND CLASSES.** The degree to which different wetland classes are scattered among each other.

**LAHAR.** A mudflow or debris flow mobilized by water, which originates on the slopes of a volcano.

**LAKE.** Impoundments of open water that are 20-acres or larger.

**LANDFILL.** See TMC 18.20.150, Landfill.

**LANDSLIDE.** The abrupt downslope movement of soil, rocks, or other surface matter on a site. Landslides may include but are not limited to slumps, mudflows, earthflows, rockfalls, and snow avalanches.

**LANDSLIDE HAZARD AREAS.** Areas potentially subject to risk of mass movement due to a combination of geologic, topographic, and hydrologic factors.

**LARGE ANIMAL.** An animal with an average weight of 100 pounds or more.

**LICENSE.** Any form of written permission given to any person, organization, or agency to engage in any activity, as required by law or agency rule. A license includes all or part of a

City permit, certificate, approval, registration, charter, or plat approvals or rezones to facilitate a particular proposal. The term does not include a license required solely for revenue purposes.

**LIQUEFACTION.** A process by which a water-saturated granular (sandy) soil layer loses strength because of ground shaking commonly caused by an earthquake.

**LONG-TERM COMMERCIAL SIGNIFICANCE.** The growing capacity, productivity, and soil composition of land, which makes it suitable for long-term commercial production, in consideration with the land's proximity to population areas, and the possibility of more intense uses of land.

**LOWEST FLOOR.** The lowest floor of the lowest enclosed area (including basement and crawl space). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage, in an area other than a basement area, is not considered a building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of this Title. For purposes of the [National Flood Insurance Program Elevation Certificate](#), the lowest floor referenced in this regulation shall equal the top of the bottom floor.

**MAINTENANCE.** Those usual acts to prevent a decline, lapse, or cessation from a lawfully established condition without any expansion of or significant change from that originally established condition. For the purposes of this document, activities within landscaped areas within areas subject to native vegetation retention requirements may be considered maintenance only if they maintain or enhance the canopy and understory cover.

**MANAGEMENT ZONE.** A zone where the objective of managing that zone is to identify currently existing functions and values within the bounds of the zone. Development may occur as provided in the zoning ordinance for the underlying district, provided:

1. Existing critical area functions and values supported and protected by the management zone are identified and any new development shall assure that such functions and values are maintained or enhanced within the appropriate subbasin in the process of any new development.
2. In any area governed by the Shoreline Management Act, the entire buffer area, whether natural area buffer or Management Zone due to the presence of the elements of the built environment, is considered Management Zone and a critical area report assuring the protection of system functions and values be a condition of any shoreline substantial development permit issued to assure the overall same level of protection as critical areas while preserving the ability to achieve the priorities of the Shoreline Management Act within the City.

**MANUFACTURED HOME / MOBILE HOME.** See TMC 18.20.160 Definitions Manufactured Home and Mobile Home.

**MINERALS.** Includes gravel, sand, or other resources that are extracted from the ground, and valuable metallic substances.

**MINERAL RESOURCE LANDS.** Lands primarily devoted to the extraction of minerals or which have known or potential long-term commercial significance for the extraction of minerals.

**MITIGATION.** Means:

1. Avoiding the impact altogether by not taking a certain action or parts of an action;
2. Minimizing impacts by limiting the degree or magnitude of the action and its



implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;

3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;
5. Compensating for the impact by replacing, enhancing, or providing substitute resources or environments;
6. Monitoring the impact and taking appropriate corrective measures; and
7. Measures used in sequential order to eliminate, reduce, or compensate for adverse impacts to habitat resulting from a development proposal or alteration.

MUDFLOW. A debris flow containing an abundance of fine particles.

NATIVE VEGETATION. A mix of plant species comprising herbs, grasses, grass-like plants, shrubs and trees indigenous to the Puget Sound region that reasonably could be expected to naturally occur on the site.

NATURAL RESOURCE LANDS (of Tenino). Agricultural and Mineral Resource Lands, which have long-term commercial significance.

OAK WOODLANDS. Those areas where Oregon White Oak comprises more than 20 percent of the trees in a stand, and where the stand size is one acre or greater, provided that stand size may be smaller where White Oak serves as linkages between larger stands. Trees should be greater than 15 inches in diameter at breast height and greater than 16 feet tall.

OLD GROWTH FORESTS. Stands of trees of 40 or more acres generally containing mature and overmature trees in the overstory, a multi-layered canopy and trees of several age classes, and standing dead trees and down material.

OPEN SPACE LAND. Means ([84.34 RCW](#)):

1. Any land area, the preservation of which in its present use would:
  - a. Conserve and enhance natural or scenic resources, or
  - b. Protect streams or water supply, or
  - c. Promote conservation of soils, or wetlands, or
  - d. Enhance the value to the public of abutting or neighboring parks, forests, wildlife preserves, nature reservations or sanctuaries or other open space, or
  - e. Enhance recreation opportunities, or
  - f. Preserve historic sites, or
  - g. Preserve visual quality along highway, road, and street corridors or scenic vistas, or
  - h. Retain in its natural state tracts of land not less than one acre situated in an urban area and open to public use on such conditions as may be reasonably required by the legislative body granting the open space classification, or
2. As a condition of granting open space classification, the legislative body may not require public access on land classified under 2c of this definition for the purpose of promoting conservation of wetlands.

ORDINANCE. The ordinance, resolution, or other procedure used by the City to adopt regulatory requirements.

ORDINARY HIGH WATER MARK (OHWM). The mark on all lakes, streams and tidal waters that will be found by examining the beds and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland and vegetation, as that condition exists on the effective date of this title, or as it may naturally change thereafter. In any area where the ordinary high water mark cannot be found, the ordinary high water mark shall be the line of mean high water.

**OUT-OF-KIND MITIGATION.** To replace wetlands with substitute wetlands whose characteristics do not approximate those destroyed or degraded by a regulated activity.

**PARTIES OF RECORD.** See TMC 18.20.190 Definition Parties of Record.

**PERMANENT EROSION CONTROL.** Continuous on-site and off-site control measures that are needed to control conveyance and/or deposition of earth, turbidity, or pollutants after development, construction, or restoration.

**PERSON.** See TMC 18.20.190 Definition Person.

**PLAT.** A map or representation of a subdivision, showing thereon the division of a tract or parcel of land into lots, blocks, streets and alleys, or other divisions and dedications.

**PONDS.** Naturally occurring impoundments of open water less than 20-acres in size and larger than 2,500 square feet, which maintain standing water throughout the year. Also see depressional pothole.

**PRIVATE ORGANIZATION.** A nonprofit corporation organized pursuant to [RCW 24.03](#), which includes the planting of game fish among its purposes for organizing as a nonprofit corporation.

**PROJECT PERMIT.** See TMC 18.20.190 Definition Project Permit.

**PROFESSIONAL ENGINEER.** An engineer currently licensed and registered in the State of Washington.

**PUBLIC SERVICES.** Fire protection and suppression, law enforcement, public health, education, recreation, environmental protection, and other governmental services.

**RECESSIONAL OUTWASH GEOLOGIC UNIT.** Sand and gravel materials deposited by melt-water streams from receding glaciers.

**RECONSTRUCTION.** The rebuilding of an existing structure which has been partially or completely destroyed by any cause, such as but not limited to fire, wind, landslides, and water, without increasing the original floor area or square footage area.

**RECTIFICATION.** An action, which repairs an alteration to habitat and its functions.

**REGOLITH.** Any body of loose, noncemented particles overlying and usually covering the bedrock.

**REGULATED ACTIVITIES.** See TMC 18.20.210 Definition Regulated Activities.

**REHABILITATION.** Any improvements and repairs which are made to the interior and exterior of an existing structure, but which do not result in any increase in the floor area of the structure. This is also commonly referred to as a “remodel” of an existing structure.

**RESTORATION.** An action which returns habitat to a state in which its stability and functions approach its unaltered state as closely as possible.

**RIPARIAN.** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. Riparian habitat begins at the ordinary high water mark and includes the entire extent of the floodplain and riparian areas of wetlands that are directly connected to the stream course.

**SEISMIC HAZARD AREAS.** Areas subject to severe risk of damage as a result of earthquake-induced ground shaking, slope failure, settlement, or soil liquefaction.

**SENSITIVE AREAS.** Agricultural, mineral, and forest resource lands and associated buffers.

**SHORELANDS or SHORELAND AREAS.** Those lands extending landward for two hundred feet in all directions as measured on a horizontal plane from the ordinary high water mark; floodways and contiguous floodplain areas landward two hundred feet from such floodways; and all wetlands and river deltas associated with the streams, lakes, and tidal waters which are subject to the provisions of this chapter.

**SHORELINE.** For this Title means the line where a body of water and the shore meet or the strip of land along the shoreline as defined by [RCW 90.58.030](#).

**SINGLE-FAMILY DWELLING.** A detached building designed exclusively for occupancy by one family and containing one dwelling unit.

**SITE.** A lot, parcel, tract, or combination of lots, parcels, or tracts on which a regulated activity is proposed.

**SLOPE.** An inclined earth surface, the inclination of which is expressed as the ratio of horizontal distance to vertical distance.

**SLOPE, STABLE.** An inclined earth surface, the inclination of which is expressed as the ratio of horizontal distance to vertical distance that through a geological assessment is deemed stable, which is then not considered a critical area.

**SLUDGE.** A semisolid substance consisting of settled solids combined with varying amounts of water and dissolved materials generated from a wastewater treatment plant or system or other sources, including septage sludge, sewage sludge, and industrial sludge.

**SLUDGE LAND APPLICATION SITE.** A site where stabilized sludge, septage, and other organic wastes are applied to the surface of the land in accordance with established agronomic rates for fertilization or soil conditioning.

**SLUMP.** The downward and outward movement of a mass of bedrock, colluvium, or regolith along a distinct surface of failure.

**SMALL ANIMAL.** An animal with an average weight of less than 100 pounds.

**SNAG-RICH AREAS.** Forested areas of 40 or more acres which contain concentrations of standing dead trees, averaging ten snags or greater per acre, and averaging greater than 15-inches in diameter at breast height.

**SPECIAL OCCUPANCY STRUCTURES.** Those structures that have the potential to provide capacity for large numbers of people or special groups of people or assemblies such as but not limited to schools, jails and detention facilities, and resident incapacitated patients.

**SPECIES OF LOCAL IMPORTANCE.** Species that are of local concern due to their population status or their sensitivity to habitat manipulation.

**SOFT ARMORING TECHNIQUES.** The use of woody plants and limited structural-mechanical systems that are integrated in a structurally and environmentally sound manner to repair and protect slopes and shorelines against shallow mass wasting and surface erosion. Measures such as live stake, live fascine, brushlayer, live cribwall, vegetated geogrid, branchpacking, live slope grading, beach berms, or earthen berms are examples of soft armoring techniques. Soft armoring techniques may also be referred to as soil bioengineering methods.

**STANDARD PENETRATION TEST** (SPT). A soil testing procedure.

**STATE ENVIRONMENTAL POLICY ACT (SEPA).** See [RCW 43.21C.010](#).

**SEPA RULES.** Pursuant to WAC Chapter 197-11 adopted by Washington State Department of Ecology as now, or hereafter, amended.

**STOCKPILING.** The placement of material with the intent to remove it later.

**SUBBASIN.** A drainage area which drains to marine water, lakes or the mainstem a WRIA watershed area.

**SUBCLASS.** One of the subclasses identified in the [United States Fish and Wildlife Service \(USFWS\) December 1979 publication, Classification of Wetlands and Deep Water Habitats of the United States](#).

**SUBSTANTIAL IMPROVEMENT.** Any repair, reconstruction, addition, rehabilitation, or other improvement of a structure, whereby the current permit valuation for the work exceeds 50 (fifty) percent of the current permit valuation of the existing structure. The Building Official or Designee shall determine the current permit valuation based on the cost per square foot values in effect at the time of permit application. Substantial improvement shall

be accumulative from the effective date of this ordinance. For purposes of this definition, substantial improvement is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure. The term does not, however, include either:

1. Any project for improvement of a structure to correct existing violations of State or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions; or
2. Any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

**SUBSTRATE.** The soil, sediment, decomposing organic matter, or combination of those located on the bottom surface of a wetland.

**TALUS.** A homogenous area of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft) composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. Talus areas may be associated with cliffs.

**TEN-YEAR TIME TRAVEL ZONE BOUNDARY.** The maximum distance around a pumping well from which a contaminant hypothetically present in groundwater could travel to the well within a ten-year time period.

**TEMPORARY EROSION SEDIMENT CONTROL ([TESC](#)).** On-site and off-site control measures that are needed to control conveyance or deposition of earth, turbidity, or pollutants during development, construction, or restoration.

**TOE OF SLOPE.** A distinct topographic break in slope at the lower-most limit of the landslide or erosion hazard area.

**TOP OF SLOPE.** A distinct topographic break in slope at the uppermost limit of the landslide or erosion hazard area.

**TCPH&SSD.** The Thurston County Public Health & Social Services Department.

**UNDERGROUND STORAGE TANKS.** Any one or a combination of tanks (including underground pipes connected thereto) which are used to contain or dispense an accumulation of hazardous substances or hazardous wastes, and the volume of which (including the volume of underground pipes connected thereto) is 10 percent or more beneath the surface of the ground.

**URBAN GOVERNMENTAL SERVICES.** Those governmental services historically and typically delivered by cities, and includes, storm and sanitary sewer systems, domestic water systems, street cleaning services, and other public utilities associated with urban areas and normally not associated with non-urban areas.

**URBAN GROWTH.** Growth that makes intensive use of the land for the location of buildings, structures, and impermeable surfaces to such a degree as to be incompatible with the primary use of such land for the production of food, other agricultural products, or fiber, or the extraction of mineral resources. When allowed to spread over wide areas, urban growth typically requires urban governmental services. Characterized by urban growth refers to land having urban growth located on it or to land located in relationship to an area with urban growth on it as to be appropriate for urban growth.

**UTILITY LINE.** Pipe, conduit, cable, or other similar facility by which services are conveyed to the public or individual recipients. Such services shall include, but are not limited to, water supply, electric power, gas, communications, and sanitary sewers.

**VIEW CORRIDOR.** An area, which affords views of lakes, mountains, or other scenic amenities normally enjoyed by residential property owners.

**VOLCANIC HAZARD AREAS.** Those areas subject to pyroclastic flows, lava flows, and

inundation by debris flows, mudflows, or related flooding resulting from geologic or volcanic events on Mount Rainier.

WASHINGTON ADMINISTRATIVE CODE (WAC). The State of Washington Administrative Code.

WELLHEAD PROTECTION AREA. The surface and subsurface area surrounding a well or well field that supplies a public water systems through which contaminants are likely to pass and eventually reach the water well(s) as designated under the Federal Clean Water Act.

WETLAND or WETLAND AREAS. Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from non-wetland areas to mitigate the conversion of wetlands. The definitions set forth in chapter [90.58](#) RCW shall also apply as used herein.

For the purpose of this definition:

1. Where the vegetation has been removed or substantially altered, the presence of a wetland is determined by the presence or evidence of hydric soil, by other documentation such as aerial photographs of the previous existence of wetland vegetation or by any other manner authorized in the “[Washington State Wetlands Identification and Delineation Manual](#),” 1997, Department of Ecology;
2. A wetland may occur along the shoreline of a lake, a stream or in a depression in the landscape. For any wetland occurring along a shoreline, the wetland's waterward boundary is where the water's depth exceeds six and six-tenths feet below low water or, if low water cannot be determined, six and six-tenths feet below the outlet's invert elevation; and
3. Except for artificial features intentionally made for the purpose of mitigation, a wetland does not include an artificial feature made from a nonwetland area which may include, but is not limited to, a surface water conveyance for drainage or irrigation, a grass-lined swale, a canal, a flow control facility, a wastewater treatment facility, a farm pond, a wetpond, landscape amenities or a wetland made after July 1, 1990 which was unintentionally made as a result of the construction of a road, street, or highway.
4. Wetlands shall include those wetlands intentionally created from non-wetland areas, formed to mitigate conversion of wetlands.

WETLAND, ISOLATED. A wetland, which is not hydrologically connected to other waters, does not have permanent open water and is often of low function.

WETLAND REPORT. A written document prepared by a wetland specialist as specified by TMC 18D.30.070 Appendix B.

WETLAND SPECIALIST. A person with experience and training in wetlands issues and with experience in performing wetland delineations, analyzing wetland functions and values, analyzing wetland impacts, and recommending wetland mitigation and restoration.

Qualifications are:

1. A Society of Wetland Scientists (SWS) Professional Wetland Scientist (PWS) or Wetland Professional In-Training (WPIT) based on following criteria:
  - a. A Bachelor of Science or Bachelor of Arts or equivalent degree in hydrology, soil



- science, botany, ecology, or related field. A graduate degree in one of these fields is an indication of more advanced expertise; and
- b. At least two years of full-time work experience as a wetlands professional including delineating wetlands using the state or federal manuals, preparing wetland reports, conducting function assessments, and developing and implementing mitigation plans.
  - c. Completion of additional wetland-specific training programs. This could include a more comprehensive program such as the University of Washington Wetland Science and Management Certificate Program, or individual workshops on wetland delineation, function assessment, mitigation design, hydrophytic plant or hydric soil identification, etc; or
2. Possess a Bachelor of Science or Bachelor of Arts or equivalent degree in biology, botany, environmental studies, fisheries, soil science, wildlife, agriculture, or related field; and
  3. Two years of related work experience, including a minimum of one year experience delineating wetlands using the Washington State Wetlands Identification and Delineation Manual and the Unified Federal Manual in preparing wetland reports and mitigation plans. Additional education as stated in 1c above may substitute for one year of related work experience; or
  4. Five years of wetland related work experience and training, with a minimum of two years experience delineating wetlands using [Ecology Publication #96-94](#), March 1997 Edition, or latest adopted edition, in preparation of wetland reports and mitigation plans.
  5. In addition, anyone meeting the criteria of a qualified wetland specialists above should also be able to demonstrate familiarity with the City Development Regulations, Ecology Publication #04-06-024 and the requirements of this Title.
- WILDLIFE BIOLOGIST.** A professional with a degree in wildlife, or certification by The Wildlife Society, or with five years professional experience as a wildlife biologist.

#### **18D.10.070 Administration.**

- A. **Approvals Required.** An approval must be obtained from the City when the Department determines that the site or project area is or may be located within a critical area, as set forth in each Chapter.
- B. **Application Requirements.**
  1. **Preliminary Review.** Provisions to conduct a preliminary review of an application are set forth in TMC 18.40.070, Process Types.
  2. **Application Filing.**
    - a. Applications shall be reviewed for completeness in accordance with Department submittal standards checklists and pursuant to TMC 18.40.150, Determination of Completeness.
    - b. Applications and associated reports shall not be submitted without an accompanying permit application for an underlying action (parent application) such as, but not limited to, a building permit, subdivision or boundary alteration action, site development application, TCPH&SSD permit, or use permit, with the exception of applications required by the Department as a result of an enforcement action.
  3. **Modifications.** The Department may request an update of any required assessment, report, delineation, etc. due to the potential for change in the existing environment that may have been caused by a natural event (e.g., seismic event, landslides, flooding, etc.) or human induced activity that degraded the existing conditions that occurred after the original document was initially submitted.

- C. **Public Notice.** Public notice provisions for notice of application; public hearing, if applicable; and final decision pursuant to this Title are outlined in TMC 18.40.190, Notice of Public Hearing.
- D. **Review.**
1. **Initial Review.** The Department shall conduct an initial review of any application in accordance with the provisions outlined in TMC 18.40.150, Determination of Completeness.
  2. **Review Responsibilities.**
    - b. The Department is responsible for administration, circulation, and review of any applications and approvals required by this Title.
    - c. The Planning Commission shall be the decision authority for reasonable use applications.
    - d. Other City or County departments and State agencies, as determined by the Department, may review an application and forward their respective recommendations to the City.
  3. **Review Process.**
    - a. The Department shall perform a critical area review for any building or land use application submitted for a regulated activity, including, but not limited to, those set forth in Section 18D.20.020. Reviews for multiple critical areas shall occur concurrently.
    - b. The Department shall, to the extent reasonable, consolidate the processing of related aspects of other Tenino regulatory programs which affect activities in regulated critical areas, such as subdivision or site development, with the approval process established herein so as to provide a timely and coordinated review process.
    - c. As part of the initial review of all development or building-related approvals or permit applications, the Department shall review the information submitted by the applicant to:
      - (1) Confirm the nature and type of the critical area and evaluate any required assessments, reports, or studies;
      - (2) Determine whether the development proposal is consistent with this Title;
      - (3) Determine whether any proposed alterations to the site containing critical areas are necessary; and
      - (4) Determine if the mitigation and monitoring plans proposed by the applicant are sufficient to protect the public health, safety, and welfare consistent with the goals, purposes, objectives, and requirements of this Title.
    - e. Regulated activities subject to SEPA shall also be reviewed with consideration for impacts on critical areas as identified in this Title. Regulated activities that pose a significant adverse impact which are not addressed by the standards and criteria established in this Title (or gaps), may be subject to additional mitigation measures as determined through the SEPA process. A threshold determination issued pursuant to TMC Title 18C - SEPA may not be made prior to Departmental review of any special studies or technical reports required by this Title, except where the applicant requests a declaration of significance so that environmental review is required.
    - f. Critical area applications required under this Title shall be approved prior to approval of any related action (parent application) such as, but not limited to, a building permit, subdivision action, site development action, forest practice application, or use permit.

- g. The requirement to submit a critical area assessment, report, etc., required under this Title, may be waived at the Department's discretion when the proposed project area for a regulated activity is located in an area that has been the subject of a previously submitted and approved assessment, report etc., if all of the following conditions have been met:
  - (1) The provisions of this Title have been previously addressed as part of another approval.
  - (2) There has been no material change in the potential impact to the critical area or required buffer since the prior review.
  - (3) There is no new information available that is applicable to any critical review of the site or particular critical area.
  - (4) The permit or approval has not expired or, if there is no expiration date, no more than five years have elapsed since the issuance of that permit or approval.
  - (5) Compliance with any standards or conditions placed upon the prior permit or approval has been achieved or secured.
- 4. **Burden of Proof.** The applicant has the burden of proof that a proposed application complies with the standards set forth in this Title.
- 5. **Approval.**
  - a. The Department may approve, approve with conditions, or deny any development proposal in order to comply with the requirements and carry out the goals, purposes, objectives, and requirements of this Title based on the Approval Authority's evaluation of the ability of any proposed mitigation measures to reduce risks associated with the critical area and compliance with required standards. Approval of a development proposal does not discharge the obligation of the applicant to comply with the provisions of this Title.
  - b. Applicants shall comply with the recommendations and/or mitigation measures contained in final approved assessments or reports and any conditions of approval.
  - c. Approval of an application required under this Title must be given prior to the start of any development activity on a site.
- 6. **Denial.** The Department shall have the authority to deny any application for development or building-related approvals or permits when the criteria established in this Title have not been met.
- 7. **Time Period for Final Decision.** The provisions for issuing a notice of final decision on any application filed pursuant to this Title are set forth in TMC 18.40.040, Coordination of Development Permit Procedures.
- E. **Time Limitations.**
  - 1. **Expiration of Approval.**
    - a. Approvals granted under this Title shall be valid for the same time period as the underlying permit (e.g., preliminary plat, site development, building permit). If the underlying permit does not contain a specified expiration date then approvals granted under this Title shall be valid for a period of three years from the date of issue, unless a longer or shorter period is specified by the Department.
    - b. The approval shall be considered null and void upon expiration unless a time extension is requested and granted as set forth in Subsection 2 below.
  - 2. **Time Extensions.**



- a. The applicant or owner(s) may request in writing a one-time, one year extension of the original approval.
- b. Knowledge of the expiration date and initiation of a request for a time extension is the responsibility of the applicant or owner(s).
- c. A written request for a time extension shall be filed with the Department at least 60 days prior to the expiration of the approval.
- d. Upon filing of a written request for a time extension, a copy shall be sent to each party of record together with governmental departments or agencies that were involved in the original approval process. By letter, the Department shall request written comments be delivered to the Department within 30 days of the date of the letter.
- e. Prior to the granting of a time extension, the Department may require a new application(s), updated study(ies), and fee(s) if:
  - (1) The original intent of the approval is altered or enlarged by the by the renewal;
  - (2) If the circumstances relevant to the review and issuance of the original approval have changed substantially; or
  - (3) If the applicant failed to abide by the terms of the original approval.
- f. If approved, the one-year time extension shall be calculated from the date of granting said approval.

#### **F. Recording.**

##### **1. Approvals.**

- a. Critical Area permit/application approvals are to be recorded on the title of the project parcel(s) at the Thurston County Auditor's Office within six months of issuance. Failure to record an approval in this timeframe may result in the project being placed into inactive status. A new application(s) and fee(s) may be required to remove the project from inactive status. Also refer to Section 18D.10.110 Title and Plat Notification for additional recording requirements.
- b. Wetland approval for work completed within utility line easements on lands not owned by the jurisdiction shall be also be recorded by the applicant.

##### **2. Right of Entry Agreement.** The City may require the applicant to record a Right of Entry Agreement, which shall be consistent with a format (e.g., on the face of a plat, short plat, or other recordable document) approved by the Department. The Right of Entry Agreement shall:

- a. Allow Director or agent to access the site for purposes of inspection during the course of application review, construction, and post-construction monitoring.
- b. Allow the Director or agent to enter a property to construct required improvements, implement mitigation measures, or conduct monitoring programs that have been financially guaranteed through the established period of time.
- c. Run with the land, and be binding on all parties having or acquiring any right, title, interest, or any part thereof of the site, including the grantor, heirs, successors, and assigns.

#### **18D.10.080 Critical Area Protective Measures.**

- A. **General.** All critical area tracts, conservation easements, land trust dedications, and other similarly preserved areas shall remain undeveloped in perpetuity, except as they may be allowed to be altered pursuant to each Chapter.
- B. **Financial Guarantees.**

1. The City may require an applicant to submit one or more financial guarantees to the City, as set forth in each Chapter of this Title and other TMC sections as required, to guarantee any performance, mitigation, maintenance, or monitoring required as a condition of permit approval. The approval for the project will not be granted until the financial guarantee is received by the Department. If the City or one of its departments is the applicant of a project, a financial guarantee shall not be required.
2. Financial guarantees required under this Title shall be:
  - a. In addition to any other site development guarantees required for project approval.
  - b. Submitted on financial guarantee forms approved by the City.
  - c. In the amount of 125 percent of the estimate of the cost of mitigation or monitoring to allow for inflation and administration should the City have to complete the mitigation or monitoring, unless the provisions set forth in 18D.10.080 C below are applicable.
  - d. Released by the City only when the applicant's appropriate technical professional has provided written confirmation that the performance, mitigation, or monitoring requirements have been met and Department staff or agent have inspected the site(s) for compliance.
  - e. Also see 18D10.140 Appendix C.
3. Failure to complete any performance, mitigation, or monitoring may result in the forfeiture of the guarantee. Applicants who have previously defaulted will no longer be allowed to post a guarantee for improvements necessary for approval of a land use application. Applicants who have previously defaulted will be allowed to post guarantees for subsequent critical area mitigation work needed for approval of a land use application or permit, but the guarantee must be by bond and must be for two times the required amount.

**C. Title and Land Division Notification.**

**1. General.**

- a. Title and/or land division notice shall be required to be recorded with the Thurston County Auditor on each site that contains a critical area, prior to approval of any regulated activity on a site.
- b. If more than one critical area subject to the provisions of this Title exists on the site, then one notice which addresses all of the critical areas shall be sufficient.
- c. Title and land division notifications and notes shall be approved by the Department and shall be consistent with Appendix 18D.10.140 C.

**2. Title Notification.**

- a. When the City determines that activities not exempt from this Title are proposed, the property owner shall file a notice with the Thurston County Auditor. The notice shall provide a public record of the presence of a critical area and associated buffer, if applicable; the application of this Title to the property; and that limitations on actions in or affecting such critical area and associated buffer, if applicable, may exist.
- b. The notice shall be notarized and shall be recorded with the Thurston County Auditor prior to approval of any regulated use or activity for the site.
- c. Notice on title is not required for utility line easements on lands not owned by the jurisdiction conducting the regulated activity (e.g., gas pipelines).

3. **Land Division Notification and Notes.** The applicant shall include notes, as referenced in 18D.10.140 Appendix B, on the face of any proposed activity as defined in the TMC 18E, Subdivisions (i.e., final plat, binding site plan, large lot, short subdivision,

boundary line adjustment, or lot combination) for projects that contain critical areas or critical area buffers. The applicant shall also clearly identify the critical area boundaries and the boundary of any associated buffers on the face of these documents.

- D. **Conservation Easements.** Prior to any final critical area approval, the part of the critical area and required buffer which is located on the site shall be protected with a conservation easement or other similar permanent deed restriction. The conservation easement shall indicate allowable and prohibited uses within the critical area and required buffer.
- E. **Tracts.** Prior to final approval of any subdivision, short subdivision, or binding site plan, the part of the critical area and required buffer which is located on the site, shall be placed in a separate tract or tracts (see [Figure 18D.10-2](#)). In lieu of a separate tract, an applicant may propose to establish an alternative permanent protective mechanism; however, approval of such is based upon the Department's determination that such alternative mechanism provides the same level of permanent protection as designation of a separate tract or tracts.
- F. **Homeowner's Covenants.** A description of the critical area and required buffer shall be placed in any required homeowner's covenants. Such covenants shall contain a detailed description of the allowable uses within the critical area and, if applicable, associated buffer and provide for any long term management and maintenance requirements of that critical area.
- G. **Identification of Critical Areas and Required Buffers on Construction Plans.** Critical areas and required buffers shall be clearly identified on all construction plans such as, but not limited to, site development plans, residential building plans, commercial building plans, forest harvest plans, etc.
- J. **Markers, Fencing, and Signage.**
  - 1. **Markers.** Prior to final approval of any critical area application, the outer edge of the critical area boundaries or, if applicable, required buffer boundaries on the site shall be flagged by the qualified professional, as outlined in each Chapter. These boundaries shall then be identified with permanent markers (rebar and cap) and flagged by a licensed surveyor unless otherwise stated in this Title. The permanent markers shall be clearly visible, durable, and permanently affixed to the ground.
  - 2. **Fencing.**
    - a. **Temporary Construction Fencing.** Temporary fencing is required when vegetation is to be retained in an undisturbed condition within the critical area and required buffer. In such cases, the applicant will be required to construct silt fencing, construction fencing, or other City approved methods of temporary fencing at the edge of the critical area or, if applicable, the edge of the required buffer prior to beginning construction on the site.
    - b. **Permanent Fencing.** Where deemed necessary by the Department to provide protection to the critical area, the applicant shall construct permanent fencing along the buffer boundary.
  - 3. **Signage.**
    - a. The Department shall require permanent signage to be installed at the edge of the critical area or, if applicable, the edge of the required buffer.
    - b. The sign shall indicate the type of critical area and if the area is to remain in a natural condition as permanent open space.
    - c. Exact sign locations, wording, size, and design specifications shall be presented by the applicant and approved by the Department. Required signage shall be clearly visible, durable, and permanently affixed to the ground.

- d. Prior to final approval of any critical area application, the applicant shall submit an affidavit of posting to the Department as proof that the required signs were posted on the site.

**K. Building Setbacks.**

1. Unless otherwise provided in this Title, buildings and other structures shall be set back a distance of 15 feet from the edge of all critical buffer areas or, where no buffers are required, the edge of the critical area.
2. The following uses and activities may be allowed in the building setback areas:
  - a. Landscaping;
  - b. Uncovered decks;
  - c. Building overhangs if such overhangs do not extend more than 18 inches into the setback area;
  - d. Impervious ground surfaces, such as driveways, parking lots, roads, and patios, provided that such improvements conform to the water quality standards set forth in the City's adopted Stormwater Management Manual and that construction equipment does not enter the buffer during the construction process; and
  - e. Clearing and grading.

**18D.10.085 Variances to Critical Areas.**

- A. **General.** Variances are pursuant to TMC 18.50.080, Variance. Conditions may be attached to a critical area(s) variance, which will serve to meet the goals, objectives, and policies of this Title.
- B. **Criteria for Priority Habitat Buffer Variances.** In order to grant a priority habitat buffer variance, requirements pursuant to TMC 18.50.080, Variance, shall apply. In addition, the applicant must also demonstrate, and the Planning Commission must find, that the requested buffer width modification preserves adequate vegetation to:
  1. Maintain proper water temperature;
  2. Minimize sedimentation; and
  3. Provide food and cover for listed species.
- C. Should a variance be denied, the application will be reviewed as a reasonable use exception pursuant to Section 18D.20.050.

**18D.10.090 Reconsideration and Appeal Procedures.** Procedures for appeal of an administrative or Planning Commission decision issued pursuant to this Title are set forth in TMC 18.40.090, Process II, Administrative Action, or TMC 18.40.100 Process III, Planning Commission Decisions, respectively.

**18D.10.100 Fees.** Fees for applications and/or review of reports, studies, or plans filed pursuant to this Title are set forth in TMC Chapter 18.30.110.

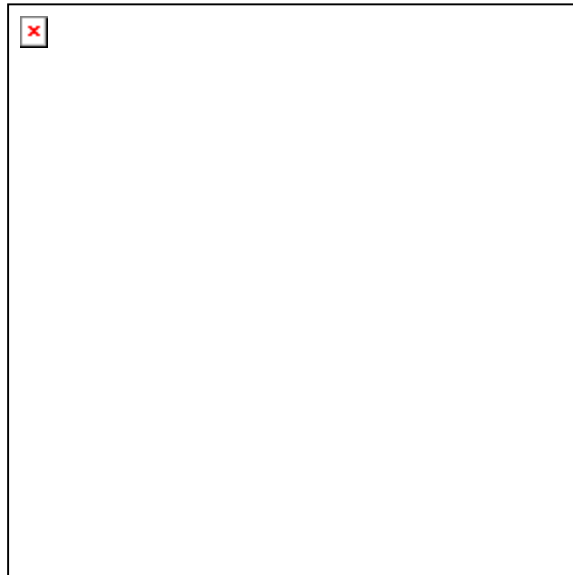
**18D.10.110 Compliance.**

- A. The regulations for compliance with the provisions of this Title are set forth in TMC 18.30.040, Scope and Compliance.
- B. When a critical area or its required buffer has been altered in violation of this Title, the Department shall require the property owner to bring the site into compliance. The property owner shall be required to submit the appropriate critical area application and commence a Departmental review as applicable for each Chapter of this Title. In addition to any required site investigation, delineations, assessments, reports, etc., the property owner shall be

required to submit a restoration plan that identifies the proposed mitigation to bring the subject property into compliance with the requirements of this Title.

**18D.10.120 Warning and Disclaimer of Liability.** The degree of protection required through application of this Title is deemed to be reasonable for regulatory purposes and is based on scientific and engineering considerations. However, natural events that may exceed the geographic boundaries regulated under this Title can and will occur (e.g., flood heights that are higher than anticipated). This Title does not mean to imply that land outside designated hazard areas or uses permitted within such areas will be free from damages. Application of this Title shall not create liability on the part of City, any officer or employee thereof, or the Federal Insurance Administration for any damages that may result from the administration of this Title or any administrative decision lawfully made hereunder.

**18D.10.130 Severability.** If any provision of this Title or its application to any person or circumstance is held invalid, the remainder of this regulation or the application of the provision to other persons or circumstances shall not be affected.



**18D.10.135 Enforcement - Violation – Civil infraction.** Provisions of TMC Chapter 18.30.130 Enforcement, shall apply to this Title.

**18D.10.140 Appendices.**

- A. [Mapping Sources.](#)
- B. [Title and Plat Notification Forms.](#)
- C. [Forfeiture of Financial Guarantees.](#)

**18D.10.150 Figures**

- [Figure 18D.10-1 Foundation Footing Setback.](#)
- [Figure 18D.10-2 Critical Area Protective Measures – Tracts.](#)

## 18D.10.140 Appendices.

### APPENDIX A

**MAPPING SOURCES.** The following sources of information, or latest available version, may be used to indicate the presence of critical areas within Tenino and provide data used in the development of the City of Tenino Critical Area Atlas Maps:

- A. The following sources identify **wetlands** that are depicted in the Tenino Wetland Inventory map and/or used as indicators of wetland presence:
  - 1. Soil Survey of Thurston County Area, Washington, Issued June 1990, Soil Conservation Service, United States Department of Agriculture (USDA);
  - 2. National Wetland Inventory Maps, U.S. Department of Interior, Fish and Wildlife Service, 1973;
  - 3. FEMA FIRM's and any Flood Insurance Study Maps;
  - 4. Aerial photographs, Thurston Regional Planning Council, Aerial Orthophotography, September 2002 or City acquired aerial orthophotography;
  - 5. Applicant supplied and verified data; and
  - 6. Ongoing field investigations to categorize and delineate wetlands;
- B. The following sources identify **landslide and erosion hazard areas** that are depicted in the Landslide Hazard Area map or used as indicators of landslide hazard area presence:
  - 1. Soil Survey of Thurston County Area, Washington, Issued June 1990, Soil Conservation Service, United States Department of Agriculture (USDA);
  - 2. Areas designated as slumps, earthflows, mudflows, lahars, or landslides on maps published by the United States Geological Survey or Washington Department of Natural Resources Division of Geology and Earth Resources;
  - 3. The City of Tenino topographic data;
  - 4. United States Geologic Survey Quadrangle maps;
  - 5. Applicant supplied and verified data of active landslide areas and potentially unstable areas; and
- C. The following sources identify **seismic hazard areas** which are depicted in the Critical Areas Seismic Hazard Areas map and/or used as indicators of seismic hazard area presence:
  - 1. Washington State Department of Natural Resources Division of Geology and Earth Resources 1-100,000 Scale Digital Geology of Washington State; and
  - 2. Areas designated as faults or subject to liquefaction or dynamic stelement on maps or data published by the United States Geological Survey or Washington Department of Natural Resources Division of Geology and Earth Resources.
- D. The following sources identify **volcanic hazard areas** that are depicted in the Critical Areas Volcanic Hazard Areas map:
  - 1. Pringle, P. T. 1994. Volcanic hazards in Washington – A growth management perspective. Washington Geology, vol. 22, no. 2, pp. 25-33. Waldron, H. H. 1989.
  - 2. Volcanic hazards in Washington. In Galster, R. W., chairman. Engineering Geology in Washington. Division of Geology and Earth Resources, Washington Department of Natural Resources. Bulletin 78, vol. I, pp. 91-96.
- E. The following sources identify **fish and wildlife habitats** or presence and/or are used as indicators of critical fish or wildlife presence:
  - 1. Water Type Reference Maps, Washington Department of Natural Resources, were used as sources to identify fish and wildlife habitat areas that are depicted in the Critical Areas Fish and Wildlife Habitat Areas-Stream Typing Map;

2. Priority Habitats and Species Program and Priority Habitat Species Maps, Washington Department of Fish and Wildlife (WDFW); Washington Department of Fish and Wildlife available at: <http://wdfw.wa.gov/hab/phspage.htm>.
  3. [Water Resource Index Areas \(WRIA\), Washington Department of Ecology](#); and
  4. Shoreline Designation maps by Thurston County approved June 30, 1972. Revision approved August 28, 1973. Revision approved September 20, 1977. Revision approved July 2, 1980. Revision approved April 15, 1985, pursuant to WAC 173-22-0668.
- F. The following sources identify the ***aquifer recharge and wellhead protection areas*** that are depicted in the Critical Areas Aquifer Recharge Area and Wellhead Protection Areas map identified by the City of Tenino Water Company using methodology described in the Department of Health Publication #331-118, April 1995.
- G. The following sources identify ***flood hazard areas***:
1. The Flood Insurance Rate Maps (FIRM's) provide the basis of the information used in the administration of this Title.
  2. Relevant and verifiable information available through FEMA.
  3. Relevant and verifiable information available through Thurston County.
  4. Relevant and verifiable information provided by an applicant, citizen or other agency.
  5. The City may add or delete land from areas of special flood hazard or revise base flood elevations in accordance with federal regulations and information provided to the City.

## 18D.10.140 Appendices

### APPENDIX B

#### CRITICAL AREAS TITLE AND PLAT NOTIFICATION/PLAT NOTES

##### A. Notice for Title Notification.

###### 1. (EXAMPLE: APPROPRIATE CRITICAL AREA FROM SECTION 18D.10.030)

Tax Parcel Number:

Address:

Legal Description:

Present Owner:

NOTICE: This property contains (e.g., wetlands or wetland buffers) as defined by Title 18D.10.30, Tenino Municipal Code. The site was the subject of a development proposal for \_\_\_\_\_ application number filed on \_\_\_\_\_ (date). Restrictions on use or alteration of the site may exist due to natural conditions of the property and resulting regulations. Review of such application has provided information on the location of the (e.g., wetland or wetland buffers) and any restriction on use.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of owner

Notary acknowledgment and notary seal

##### B. Additional Title Notification Statements that may apply.

1. Title notification for liquefaction and dynamic settlement hazard areas shall include a statement of the performance criteria (i.e., protection of life safety only, provision for minimal structural damage so that post-earthquake functionality is substantially unchanged, no structural damage for the design earthquake).
2. Title notification for fault rupture hazard areas shall include a statement that a fault rupture hazard area or associated buffer exists on the site. The title notification shall include a site plan of the subject property with the fault rupture hazard area and associated buffer identified.
3. Properties that contain flood hazard areas pursuant to Chapter 18D.70 shall include the following statement:  
“Flood Elevation Certificates are recorded with the Thurston County Assessors office.”



**C. Notice for Plat Notification/Plat Notes.**

1. **General.** The following notice shall be placed on the face of the final plat, short plat, large lot, or binding site plan documents when said subdivision contains critical areas or critical area buffers:

**Notice:** This site lies within a (e.g., landslide hazard area) as defined in Title 18D Tenino Municipal Code. Restrictions on use or alteration of the site may exist due to natural conditions of the site and resulting regulation.

2. **Native/Natural Vegetation Preservation Areas.** The following notice shall be placed on the face of the final plat, short plat, large lot, or binding site plan documents when said subdivision contains critical areas or critical area buffers and when said critical areas or critical area buffers have been identified as native/natural vegetation preservation areas.

**Notice:** "The Critical Areas (e.g., Oregon White Oak Preservation Areas) appearing on this (e.g., final site plan/ preliminary plat/final plat/short plat/large lot/engineering drawing) contain areas of natural/ native vegetation intended to buffer the Critical Area from the adverse effects of development. These Critical Areas (e.g., Oregon White Oak Preservation Areas) shall remain and be maintained in a natural, undeveloped, open space state. There shall be no clearing, grading, filling, or construction within the Critical Areas (e.g., Oregon White Oak Preservation Areas), except as shown on plans or documents approved by the City of Tenino and contained in the official files for this development. Each Critical Area (e.g., Oregon White Oak Preservation Area) shall remain undisturbed except for periodic watering and hand weeding of plants designated as noxious by the State of Washington."

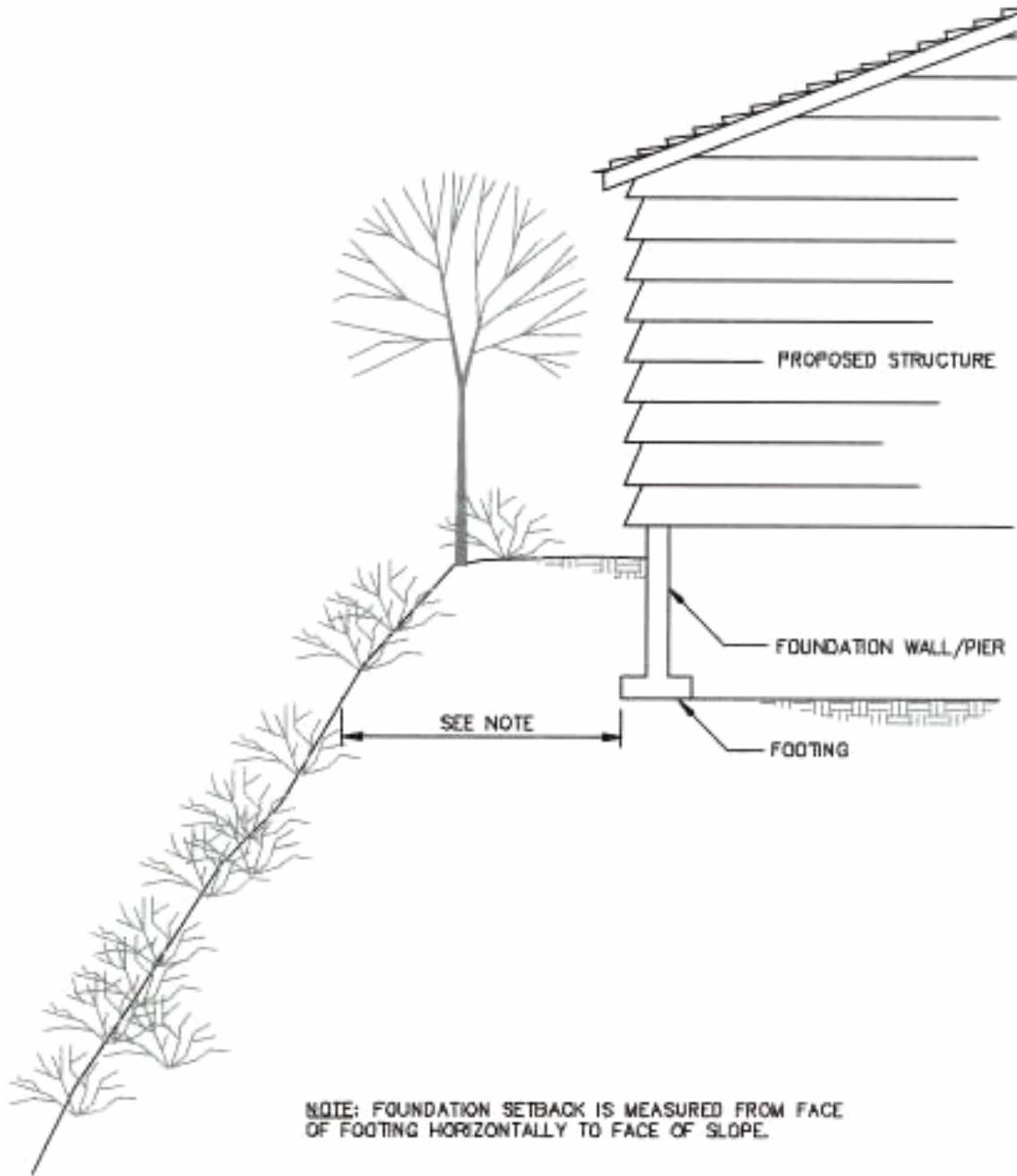
3. **Plat Notes for Flood Hazard Areas.** The following notes shall be placed on the face of any of final plat, short plat, large lot, or binding site plan documents which lie within a designated flood hazard area.
  - a. Grading, clearing, and/or filling within the limits of the 100-year floodplain is prohibited except for water course related construction, repair, and/or maintenance work that is approved by the City for management operations.
  - b. If a higher frequency event occurs or if existing conditions upon which the flood hazard area boundaries were based were to change or occur differently than depicted, then the level of protection afforded by the existing levee, if applicable, and flood hazard area standards may not be adequate to prevent the subject site from flooding.
  - c. All purchasers and developers (and/or their agents) of property within the subject development area and/or parcel shall take notice of the above conditions and hereby agree to defend, indemnify, and hold harmless Tenino from any and all claims, losses, costs, liabilities, or damages of any nature imposed upon or asserted against Tenino arising out of or caused by the City's issuance of approval or by issuance of any other permits arising out of this approval.
  - d. All occupants and/or owners of property in the subject area assume the risk of flooding which may occur and waive any claims against Tenino arising out of damage or injury to person or property resulting thereof.

**APPENDIX C**

**FORFEITURE OF FINANCIAL GUARANTEES**

Failure to complete any performance, mitigation, or monitoring requirement may result in the forfeiture of a financial guarantee. Once a financial guarantee is forfeited, the following process will apply:

- A. Financial guarantees necessary to ensure the completion of required improvements will no longer be accepted by Department to allow final approval of any plat (short plat, formal plat, large lot) from any principal with any outstanding default(s). Necessary improvements must be constructed and must be accepted as complete prior to the final approval (short plat, large lot, formal plat).
- B. Financial guarantees that are necessary for approval of a permit (such as a site development permit) to allow construction to begin will still be accepted from applicants who have defaulted as follows:
  - 1. Financial guarantees for work in existing City right-of-way will still be accepted. However these financial guarantees must be by bond and must be for two times the required amount (2 x 125 percent of estimate).
  - 2. Financial guarantees for reclamation will still be accepted, however these financial guarantees must be by bond and must be for two times the required amount (2 x number of disturbed acres x \$1,500.00).
  - 3. Financial guarantees for wetland mitigation construction and wetland monitoring will be accepted. However these financial guarantees must be by bond and must be for two times the required amount.
  - 4. Financial guarantees for temporary road approaches must be by assignment of funds and must be for two times the required amount.
  - 5. Financial guarantees that have been accepted in order to allow permit approval to construct plat improvements do not create rights to obtain final approval of the plat (short plat, formal plat, large lot).
- C. 18-month guarantees are required after site development improvements are complete to warranty defects in design, construction, etc. 18-month guarantees will still be accepted from applicants who have defaulted, but these guarantees must be by bond and must also be equal to two times the required amount or \$5,000.00, whichever is higher.
- D. Applicants who have defaulted on a financial guarantee can clear the outstanding default and return to normal financial guarantee processing through any of the following actions:
  - 1. Completing the improvements that were defaulted on;
  - 2. Proving to the Department that the requirement is impossible to meet;
  - 3. Showing that completing the requirements will cause a hardship for the affected community; or
  - 4. Showing that the requirement has been substantially met so as to constitute constructive, although not absolute, compliance with the requirement or condition.



## FOUNDATION FOOTING SETBACK

N.T.S.



City of Tenino  
Community Development Department  
149 S. Hodgden  
Tenino, WA 98589 (360) 264-2368

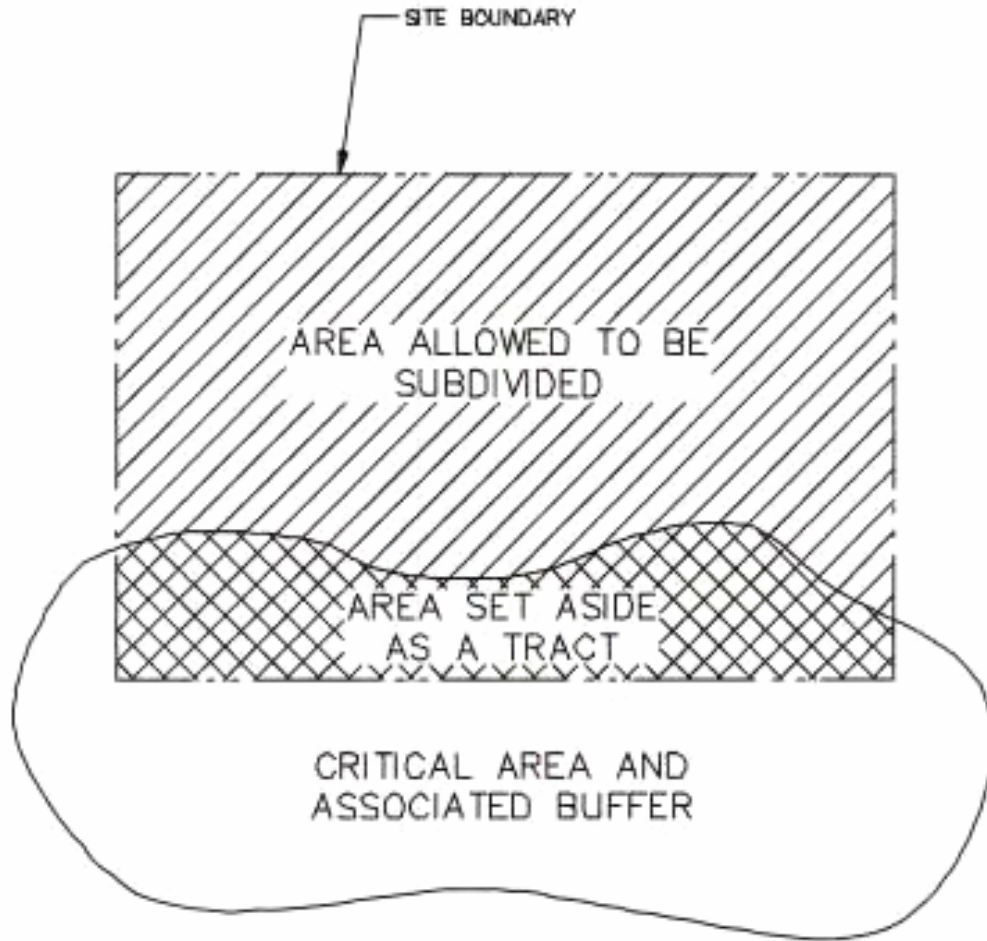
## FOUNDATION FOOTING SETBACK

Copied By: DOC

Adopted by: Ord. No. 710

Effective Date: May 2, 2005

FIGURE 18D.10-1



## **CRITICAL AREA PROTECTIVE MEASURES-TRACTS**

N.T.S.



**City of Tenino**  
Community Development Department  
149 S. Hodgden  
Tenino, WA 98589 (360) 264-2368

## **CRITICAL AREA PROTECTIVE MEASURES TRACTS**

**Copied By: DOC**

**Adopted by: Ord. No. 710**

**Effective Date: May 2, 2005**

**FIGURE 18D.10-2**

## Chapter 18D.20

### USE AND ACTIVITY REGULATIONS

#### Sections:

<a href="#"><u>18D.20.010</u></a>	<b>Permitted Uses.</b>
<a href="#"><u>18D.20.020</u></a>	<b>Regulated Uses and Activities.</b>
<a href="#"><u>18D.20.030</u></a>	<b>Exemptions.</b>
<a href="#"><u>18D.20.040</u></a>	<b>Nonconforming Uses and Structures.</b>
<a href="#"><u>18D.20.050</u></a>	<b>Reasonable Use Exceptions.</b>
<a href="#"><u>18D.20.060</u></a>	<b>Density Transfer.</b>
<a href="#"><u>18D.20.070</u></a>	<b>Current Use Assessment.</b>

**18D.20.010 Permitted Uses.** Uses permitted on properties designated as critical areas shall be the same as those permitted in the zone classification shown in the City's Zoning map unless specifically prohibited by this Title.

#### **18D.20.020 Regulated Uses and Activities.**

- A. Unless the requirements of this Title are met, the Department shall not grant any approval or permission to alter the condition of any land, water, or vegetation, or to construct or alter any structure or improvement regulated through the following: building permit, commercial or residential; binding site plan; franchise right-of-way construction permit; site development permit; right-of-way permit; short subdivision; large lots; use permits; subdivision; utility permits; or any subsequently adopted permit or required approval not expressly exempted by this Chapter.
- B. The following activities are regulated within a critical fish and wildlife habitat area, wetland, aquifer recharge areas, landslide or erosion hazard area, flood hazard area, and/or their buffers unless exempted by Section 18D.20.030:
  1. Removing, excavating, disturbing, or dredging soil, sand, gravel, minerals, organic matter, or materials of any kind;
  2. Dumping, discharging, or filling;
  3. Draining, flooding, or disturbing the water level or water table. In addition, an activity which involves intentional draining, flooding, or disturbing the water level or water table in a wetland or stream in which the activity itself occurs outside the regulated area shall be considered a regulated activity;
  4. Driving piling or placing obstructions, including placement of utilities;
  5. Constructing, reconstructing, demolishing, or altering the size of any structure or infrastructure;
  6. Altering the character of a regulated area by destroying or altering vegetation through clearing, harvesting, cutting, intentional burning, shading, or planting;
  7. Activities which result in significant changes in water temperature or physical or chemical characteristics of wetland or stream water sources, including changes in quantity of water and pollutant level;
  8. Application of pesticides, fertilizers, and/or other chemicals unless demonstrated not to be harmful to the regulated area.
  9. The division or redivision of land.
  10. The creation of impervious surfaces.

**18D.20.030 Exemptions.** The following activities are exempt from the provisions of this Title:

- A. Existing agricultural activities. The activities cease to be existing when the area on which they were conducted has been converted to a non-agricultural use or has lain idle both more than five years and so long that modifications to the hydrological regime are necessary to resume agricultural activities, unless the idle land is registered in a federal or state soils conservation program and do not cause permanent conversion of a critical area through actions such as filling, ditching, draining, clearing, grading, etc. provided that:
  - 1. Existing agricultural activities and structures shall comply with the provisions of Chapter 18D.070 Flood Hazard Areas; and
  - 2. Determination of an agricultural exemption status is limited to the specific area(s) upon which lawfully established agricultural activities are being conducted. A determination that an activity is exempt within one portion of a property does not necessarily extend to other portions of the property.
- B. Maintenance or reconstruction of existing, lawfully established public facilities provided that reconstruction does not involve expansion of the facility or use:
  - 1. Roads, paths, bicycle ways, trails, bridges, and associated storm drainage facilities or other public rights-of-way;
  - 2. Flood control improvements, such as, but not limited to, levees, revetments, floodwalls, regional storm drainage facilities, drainage structures, or channel capacity projects to protect public infrastructure and/or existing development, when administered by Tenino Public Works and Utilities provided that the work shall:
    - a. Not increase the height of the facility or linear length of the affected stream edge;
    - b. Not expand the footprint of the facility or use waterward or into any landward aquatic habitat; and
    - c. Use approved fish-friendly bioengineering techniques to the extent feasible.
- C. Maintenance or reconstruction of existing private roads, driveways, onsite septic systems, and wells, provided that reconstruction does not involve expansion of facilities, widening, or relocation.
- D. For the following utility activities, when undertaken pursuant to best management practices to avoid impacts to critical areas:
  - 1. Normal and routine maintenance or repair of existing utilities that does not include any expansion.
  - 2. Installation, replacement, operation, repair, alteration, extension, or construction of all utility lines, equipment, or appurtenances in improved City road rights-of-way.
- E. Reconstruction, remodeling, or maintenance of existing single-family residential structures and accessory structures that are located outside of a flood hazard area and active landslide hazard area, provided that a one-time only expansion of the building footprint does not increase by more than 25 percent and that the new construction or related activity does not further intrude into the critical area or related buffer. The exemption shall not apply to reconstruction which is proposed as a result of structural damage associated with a critical area, such as slope failure in a landslide hazard area or flooding in a flood hazard area.
- F. Reconstruction, remodeling, or maintenance of structures, other than single-family structures and accessory structures that are located outside a flood hazard area or active landslide hazard area, provided that such reconstruction, remodeling, or maintenance does not increase the floor area nor extend beyond the existing ground coverage. The exemption shall not apply to reconstruction which is proposed as a result of site or structural damage

associated with a critical area, such as slope failure in a landslide hazard area or flooding in a flood hazard area.

- G. Site investigative work necessary for land use application submittals such as surveys, soil logs, percolation tests, and other related activities. Critical area impacts shall be minimized and disturbed areas shall be immediately restored.
- H. Emergency action necessary to prevent imminent threat or danger to public health or safety, or to public or private property, or serious environmental degradation.
  - 1. The Department shall review all proposed emergency actions to determine the existence of the emergency and reasonableness of the proposed actions taken, however, post-emergency actions, such as submittal of permits, completion of City review, modification or removal of the emergency repair work, or mitigation shall be required by the Department.
  - 2. Shoreline erosion protection measures shall only be allowed as an emergency action when the owner can demonstrate that there is an imminent threat to an existing residential, commercial, industrial, or agricultural structure. The owner shall retain either City staff or an engineering geologist to conduct a site investigation and provide adequate documentation that the situation is actually an emergency. An emergency action is not warranted when the structure is located outside the active landslide or shoreline erosion hazard area.
- I. Wetlands less than 1,000 sf where it has been shown by the applicant that they are not associated with a riparian corridor, they are not part of a wetland mosaic, and do not contain habitat identified as essential for local populations of priority species identified by Washington Department of Fish and Wildlife.

Evaluate wetland circumstances of between 1,000 sf and 4,000 sf in size using the Washington State Wetland Rating System for Western Washington, Revised (Ecology Publication #04-06-025, August 2004) to establish category and evaluate functions.

The following criteria and local knowledge of natural resources can be used to make an informed decision about whether to exempt wetlands between 1,000 sf and 4,000 sf from the requirements to avoid impacts:

- a. The requirements to avoid impacts may be dropped for Category III and IV wetlands between 1,000 sf and 4,000 sf that meet all of the following criteria:
  - 1) The wetland is not associated with a riparian corridor; and
  - 2) The wetland is not part of a wetland mosaic; and
  - 3) The wetland does not score 20 points or greater for habitat in the 2004 Western Washington Rating System; and
  - 4) The wetland does not contain habitat identified as essential for local populations of priority species identified by Washington Department of Fish and Wildlife.
- b. Impacts allowed under this exemption shall be fully mitigated pursuant to TMC 18D.30.050 Mitigation Requirements.
- c. All Category I and II wetlands between 1,000 sf and 4,000 sf should be evaluated with full mitigation sequencing and buffer establishment and any approved impacts should be adequately compensated by mitigation.
- d. Wetlands larger than 4,000 sf shall be evaluated pursuant to TMC 18D30, Wetlands.
- J. Activities in artificial wetlands, except those artificial wetlands intentionally created from non-wetland sites, including but not limited to irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and

- landscape amenities; or, those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway.
- K. Activities on improved portions of roads, rights-of-way, or easements, provided there is no expansion of ground coverage.
  - L. Removal by hand of manmade litter and control of noxious weeds that are included on the State noxious weed list ([WAC 16-750](#)) or invasive plant species as identified by the City, County or State. Control may be conducted by clipping, pulling, or digging, or by an alternative mechanical method using light equipment and does not involve the use of hazardous substances upon approval of a plan presented to the Department.
  - M. Activities undertaken to comply with a United States Environmental Protection Agency superfund order, or a Washington Department of Ecology order, pursuant to the Model Toxics Control Act, including the following activities:
    - 1. Remediation or removal of hazardous or toxic substances;
    - 2. Source control; and
    - 3. Natural resource damage restoration.
  - N. Maintenance activities of landscaping and gardens in a required buffer, including but not limited to, mowing lawns, weeding, harvesting, and replanting of garden crops, pruning and planting of vegetation to maintain the condition and appearance of the site existing on February 1, 1992.
  - O. Activities designed for previously approved maintenance and enhancement of critical areas and/or their associated buffers.
  - P. Activities undertaken on the site of an existing holding pond where the water flow and/or water table is controlled by a previously approved pump system.
  - Q. A residential building permit for a lot which was created through a land division action subject to previous reports and assessments as required under this Title, provided that the previous reports and assessments adequately identified the impacts associated with the current development proposal.
  - R. Maintenance of individual cemetery plots in established and approved cemeteries.
  - S. Activities within a portion of a wetland buffer or fish and wildlife habitat area buffer located landward of an existing, substantially developed area, such as a paved area, dike, levee, or permanent structure which eliminates or greatly reduces the impact of the proposed activities on the wetland or fish and wildlife habitat area. The Department shall review the proposal to determine the likelihood of associated impacts.
  - T. Passive recreation such as hunting, hiking, fishing, and wildlife viewing that does not involve the construction of trails.
  - U. Enhancement actions that do not involve clearing, grading, or construction activities (e.g., revegetation with native plants and installation of nest boxes). Enhancement activity proposals shall be reviewed by the Department.
  - V. Maintenance or repair of existing shoreline erosion protection measures or structures provided that the repair shall not serve to expand any existing structures or increase the impacts of such structure on critical fish or wildlife habitat.
  - W. In addition to the general exemptions listed in this section, the following uses or activities are exempt from the provisions of Chapter 18D.50, Aquifer Recharge and Wellhead Protection Zones:
    - 1. Installation, repair or maintenance of sewer lines and appurtenances;
    - 2. Biosolid and sludge land application sites provided that these activities comply with the requirements established in [WAC 173-200](#), [173-216](#), and [173-304](#); and
    - 3. Single-family and two-family dwellings and associated accessory structures.



**18D.20.040 Nonconforming Uses and Structures.** An established use or existing structure located in a wetland, critical fish and wildlife habitat area, landslide or erosion hazard area, flood hazard area, and their associated buffers that was lawfully permitted, but which is not currently in compliance with this Title, may continue subject to the following:

- A. **Nonconforming Use Expansion.** Nonconforming uses shall not be expanded or changed in any way that increases the nonconformity without a permit issued pursuant to the provisions of this Title.
- B. **Nonconforming Structure Expansion.** Existing structures shall not be expanded or altered in any manner that will increase the nonconformity without a permit issued pursuant to the provisions of this Title, except as provided in Section 18D.20.030 F and G.
- C. **Discontinued Uses.** Activities or uses which are discontinued for 12 consecutive months shall be allowed to resume only if they are in compliance with this Title.
- D. **Substantial Damage.** Nonconforming structures, except for structures located in a flood hazard area or active landslide hazard area which are damaged or destroyed by fire, explosion, flood, or other casualty, may be restored or replaced if reconstruction is commenced within one year of such damage and is substantially completed within 18 months of the date such damage occurred. The reconstruction or restoration shall not serve to expand, enlarge, or increase the nonconformity except as allowed through the provisions in 18D.20.030 F and G. Structures in a floodway or active landslide hazard area may be allowed to be restored only up to the limits of substantial improvement, as set forth in each chapter.

**18D.20.050 Reasonable Use Exceptions.**

- A. **General Requirements.**
  - 1. If the application of this Title would deny all reasonable use of a site, development may be allowed which is consistent with the general purposes of this Title and the public interest. Nothing in this Title is intended to preclude all reasonable use of property.
  - 2. Reasonable Use Exceptions are reviewed pursuant to TMC 18.40.100, Type III - Planning Commission Decision process.
  - 3. The provisions outlined in this Section shall only be used when application of this Title would deny all reasonable use of a site.
  - 4. Reasonable use provisions shall apply to new construction, expansions, additions, replacements, and redevelopment projects.
  - 5. Applications for a reasonable use shall automatically constitute an application for a variance to reduce front, side, or rear yard setback requirements. The Planning Commission shall examine the feasibility of reducing setbacks as a method of locating a structure outside a critical area or its associated buffer prior to granting a reasonable use exception for allowing construction to occur within a critical area or its associated buffer. Reductions in setback requirements shall be given preference over granting of a reasonable use exception.
  - 6. The creation of new lots within critical areas and their associated buffers is prohibited unless that/those lot(s) are for the protection of that/those critical areas pursuant to the requirements of TMC 18D.10.080 Critical Area Protective Measures.
  - 7. The proposal must comply with all provisions in Chapters 18D.70 Flood Hazard Areas and 18D.80 Landslide Hazard Areas and 18D.110 Erosion Hazard Areas.
- B. **Application Requirements.** An application for a reasonable use exception shall include the following information:

1. A description of the areas of the site that contains a critical area, buffers, or within setbacks required under this Title;
2. A description of the amount of the site that is within setbacks required by other standards of the Zoning Code;
3. A description of the proposed development, including a site plan;
4. An analysis of the impact that the amount of development described in Section 18D.20.050 B3 above would have on the critical area(s);
5. An analysis of whether any other reasonable use with less impact on the critical area(s) and associated buffer(s) is possible;
6. A design of the proposal so that the amount of development proposed as reasonable use will have the least impact practicable on the critical area(s);
7. An analysis of the modifications needed to the standards of this Title to accommodate the proposed development;
8. A description of any modifications needed to the required front, side, and rear setbacks; building height; and buffer widths to provide for a reasonable use while providing greater protection to the critical area(s);
9. Such other information as the Department determines is reasonably necessary to evaluate the issue of reasonable use as it relates to the proposed development, such as but not limited to a wetland analysis report, mitigation plan, habitat evaluation study, and/or a buffer enhancement plan.

**C. Review.**

1. **Public Hearing Required.** The Department shall set a date for a public hearing before the Planning Commission after all requests for additional information or plan correction, as set forth in TMC 18.40.150, have been satisfied. The public hearing shall follow the procedures set forth in Chapter 18.40.190, Notice of Public Hearing.
2. **Decision Criteria.** The Planning Commission may approve a reasonable use exception if the Commission determines the following criteria are met:
  - a. The proposed development is located on an existing lot of record that was created prior to the effective date of this ordinance and there is no other reasonable use or feasible alternative to the proposed development with less impact on the critical area(s) and/or associated buffers including phasing or project implementation, change in timing of activities, buffer averaging or reduction, setback variance, relocation of driveway, or placement of structure.
  - b. The development cannot be located outside the critical area and/or its associated buffer area or management zone due to topographic constraints of the parcel or size and/or location of the parcel in relation to the limits of the critical area and/or its associated buffer area and a building or road setback variance has been reviewed, analyzed, and rejected as a feasible alternative.
  - c. The proposed development does not pose a threat to the public health, safety, or welfare on or off the site, nor shall it damage nearby public or private property.
  - d. Any alteration of the critical area(s) shall be the minimum necessary to allow for reasonable use of the property.
  - e. The inability of the applicant to derive reasonable use of the property is not the result of actions by the applicant in subdividing the property or adjusting a boundary line thereby creating the undevelopable condition after March 3, 1992.
  - f. The proposal mitigates the impacts on the critical area(s) to the maximum extent possible, while still allowing reasonable use of the site.

- g. The proposed activities will not jeopardize the continued existence of species listed by the State or Federal government as endangered, threatened, sensitive, or priority habitats.
- h. The proposed activities will not cause significant degradation of groundwater or surface water quality.
- 3. **Additional Decision Criteria for Wetlands and Associated Buffer Areas.** In addition to the decision criteria listed in Subsection 2 above, a reasonable use exception for wetlands and associated buffer areas shall also demonstrate that the proposed activity will result in minimum feasible alteration or impairment to the wetland's functions and values characteristics and existing contours, vegetation, fish and wildlife resources, and hydrological conditions.
- 4. **Additional Decision Criteria for Critical Fish and Wildlife Habitat Areas and Associated Buffers.** In addition to the decision criteria listed in Subsection 2 above, the Planning Commission may approve a reasonable use exception for critical fish and wildlife habitat areas and associated buffer areas and/or management zones if the Commission determines that the proposal complies with the mitigation measures as set forth in Section 18D.40.050.
- 5. **Planning Commission Authority.** The Planning Commission has the authority to approve an application for a reasonable use exception, approve with additional requirements above those specified in this Title, require modification of the proposal to comply with specified requirements or local conditions, or deny the application if it fails to comply with the requirements of this Title.
- 6. **Required Written Findings and Determinations.** A reasonable use exception may be approved by the Planning Commission only if all of the following findings can be made regarding the proposal and are supported by the record:
  - a. The granting of the proposal will not be detrimental to the public health, safety, and general welfare.
  - b. The granting of the proposal will not be injurious to the property, regulated critical area(s), or improvements adjacent to and in the vicinity of the proposal.
  - c. The proposal minimizes adverse environmental impacts to the maximum practicable extent and provides mitigation to offset any impacts.
  - d. The granting of the proposal is consistent and compatible with the goals, objectives, and policies of the Comprehensive Plan or community plan (if applicable), and the provisions of this Title.

**18D.20.060 Transfer of Development Rights - Density Transfer Program.**

- A. This program is implemented to primarily accomplish two goals.
  - 1. To provide property owners with development potential relief by allowing a recapture of density where certain critical areas features have been identified on an individual's property.
  - 2. To provide an incentive to protect critical areas and refocus development away from identified critical areas and associated buffers.
- B. Eligibility.
  - 1. Property has one or more of the following critical areas:
    - a. Water, stream or wetland buffer along the Scatter Creek drainage area; or
    - b. Steep slopes (greater than 100% / 45 degree slope areas) pursuant to 18D.80.020C (3) and the associated steep slope buffer.

- c. Active landslide areas pursuant to 18D.80.020C (1) and the associated active landslide area buffers.
- d. Priority Habitat Areas pursuant to 18D.40 and associated buffers.
- 2. A property owner makes application for this program and agrees to place the identified critical area(s) in a protective critical areas tract or other mechanism (18D.10.080D) or pursuant to TMC 18E Subdivision process (i.e., Boundary Line Adjustment, Short Plat, or Plat process) as required by 18D.10.080E.
- 3. Property must be serviced by a municipal sewage disposal facility ([WAC 173-308](#)). Properties serviced by on-site septic systems shall have TCPH&SSD approval for any reduced lots sizes that may be proposed by this program.
- C. Property owners with development capacity restrictions of the underlying base zoning due to identified critical areas within this Title can apply the following options to recapture development potential:
  - 1. **Critical Area Off-site Density Transfer Program.** Transfer is to an authorized Critical Area Density Transfer overlay zone pursuant to requirements of TMC Title 18B Zoning. This is the preferred option to provide maximum protection of the critical area.
  - 2. **Critical Area On-site Density Transfer Program.** Cluster development shall be allowed pursuant to requirements of TMC Title 18E Subdivisions.
- D. Development Potential Calculations. The following table establishes development potential based on the type of critical areas identified.

**Table 18D.20-1 Development Potential**

<b>Environmentally Constrained Lands*</b>	<b>Density/Development Potential</b>
Wetlands, Streams and Flood Hazard Areas	0% (cannot build on water)
Buffers of: Wetlands, Streams and Flood Hazard Areas	50%
Steep Slopes (> 100% slope)	50%
Buffers of: Steep Slope	75%
Active Landslide Hazard Areas	50%
Buffers of: Active Landslide Hazard Areas	75%
Priority Habitat areas and buffers	100%

*\*Only the identified critical areas above are considered under this program.*

**For example:** A short plat proposal is one acre in Single Family zoning at an allowable 4 units per acre density. However, a wetland is identified on the edge of the property with a 0.50-acre designated wetland buffer.

The density transfer program allows recapture of some development potential based on the table above. Using the Table above, it indicates 50% allowable development potential in buffers of wetlands. Therefore, using the example above, the calculation used to determine the additional development potential (density or units per acre) is:

50% (*development potential*) x 0.50-acres x 4 units/acre (*Single Family Zone density*)  
**Or** (50% x 0.50 x 4 = 1 unit, plus allowable unit(s)). This example yields three buildable lots and one critical areas tract.

- E. The following provisions also apply:
  - 1. This program is regulated pursuant to TMC 18.40.100 Process III as a Planning Commission Decision, with written findings that shall consider the following:
    - a. The type of environmentally constrained land(s) being considered.

- b. Residential density for sites which contain critical areas and/or buffers identified in Table 18D.20-1 shall be calculated as set forth using the formula above.
  - c. Transfer shall not exceed the number of dwelling units which would be allowed in the critical area and/or buffer of the site according to the zoning designation of the site if there were no environmentally constrained development restrictions tied to the land.
  - d. The number of dwelling units shall be equal to the number of dwelling units that could be produced on the critical area and/or buffer(s) if the sending site were subdivided in terms of the minimum requirements of the underlying zone as evidenced by a preliminary plan sketch.
  - e. Transfer may go to more than one receiving site; however, this shall not increase the total number of transferred dwelling units which are allowed.
  - f. The transfer may be used to exceed the base residential density in order to achieve maximum residential density allowed on the receiving site(s), as set forth in Section 18B Zoning. The beginning number of dwelling units (that is, the allowed number prior to transfer) at the receiving site(s) shall be equal to the base number of dwelling units that can be produced on the same site if the site were subdivided in terms of the minimum requirements of the underlying zone as evidenced by a preliminary plan sketch.
  - g. To assure that the critical area is adequately protected, a restriction shall be placed on the deed of the sending property which prohibits all regulated activities within the critical area and/or buffer(s). This restriction shall be required regardless of the number of dwelling units transferred on or off-site.
  - h. If the critical area and/or buffer is degraded as a result of human or agricultural activity, the applicant or future owners may be required to enhance the critical area and/or buffer(s) according to an enhancement plan approved by the Department.
  - i. Except for any voluntary or required enhancement, the area shall remain in a natural condition. This shall be indicated by a note on the face of any final plat, final site plan, or other final approval for activity on the sending site. In the case of a formal subdivision, the critical area and/or buffer(s) shall be placed in a separate tract.
  - j. In calculating density, fractional densities shall be rounded to the nearest whole number. Calculation figures shall be provided at two decimal places.
  - k. Preferred Density Use. The additional lot(s) may be applied (by the applicant or sold to other individuals) to increase density in the zones allowed in the Density Transfer Overlay zoning map, pursuant to TMC Title 18B Zoning; or
  - l. Allowed Density Use. The additional lot(s) may be clustered on-site with the additional allowable lot(s) pursuant to Title 18E Subdivisions.
  - m. The transfer shall not be approved until final plat approval or other required final approval for the receiving site is granted.
  - n. Transfer of Development rights shall be recorded pursuant to the provisions of 18D.10.080 Critical Area Protective Measures, Sections C, D or E, as approved by the Department. The buffer area can be included in a separate tract or lot and held in common ownership by a homeowners association, agency, or non-profit organization, or included in lots owned by adjacent landowners. When feasible, areas should be placed in a separate, non-buildable tract that is owned and maintained by an organization dedicated to protecting the critical area amenity.
2. All other lot requirements pursuant to TMC Title 18B Zoning apply (for example, lot size, setbacks, Health Department requirements, etc).

F. Submittal Requirements:

1. Completed, signed and dated Density Transfer Application form.
2. Application for Boundary Line Adjustment, Short Plat, or Preliminary Plat with identified allowed critical area(s) and /or buffer(s) (also labeled as Open Space) with square footage of area for consideration and submittal requirements pursuant to the appropriate Chapters of TMC Title 18E Subdivisions.
3. Any required report(s) pursuant to this Title detailing the critical area(s).
4. SEPA checklist.
5. Other documents that may be requested by the Department.
6. All required fees pursuant to the adopted fee schedule.
7. Approvals may also be required by other agencies, such as Ecology, TCPH&SSD, or the Corps of Engineers.

G. Upon approval, a certificate shall be issued by the City that identifies the number of density units allowed for transfer to off-site locations, which may be sold or transferred to a third party upon approval by the Department.

H. Additional Incentive. To improve the functions and values of Scatter Creek and associated wetlands, individuals granted approval under this program may also allow mitigation work that might be required by another party off-site, to complete that mitigation work at your wetland, stream or those associated buffers site. Pursuant to TMC 18D.30.050G, off-site mitigation of wetlands or buffers is allowed. These two programs will improve the functions and values of Scatter Creek and the associated wetlands, which will ultimately benefit the environment and citizens of Tenino.

I. Other Protective Measures. All other protective measures pursuant to TMC 18D shall apply.

**18D.20.070 Current Use Assessment Program.**

- A. An owner that places undeveloped Open Space or Natural Resource lands in a separate tract or tracts, protective easement, public or private land trust dedication, or other similarly preserved area shall have that portion of land considered for reassessment by the Assessor-Treasurer's Office consistent with those restrictions to determine the fair market value of the land pursuant to [RCW 84.40.030](#).
- B. Any owner of undeveloped Open Space or Natural Resource lands that has been placed in a separate tract or tracts, protective easement, public or private land trust dedication, or other similarly preserved area shall have that portion of land considered for reassessment by the Assessor-Treasurer's Office consistent with those restrictions to determine the fair market value of the land pursuant to RCW 84.40.030.
- C. The owner shall notify the Assessor-Treasurer's Office when restrictions to development occur on a particular site due to entering into this program, and may need to provide the following documents for verification:
  1. A plat map; and
  2. Wetland delineation; and/or
  3. Geotechnical study; and/or
  4. Priority habitat studies; and/or
  5. Special studies as determined by the Department or the Assessor-Treasurer's Office.
- D. The Department shall also notify the Assessor's Office when restrictions to development occur at a particular site.

## Chapter 18D.30

### WETLANDS

#### Sections:

- [18D.30.010](#) Purpose.
- [18D.30.020](#) Wetland Areas.
- [18D.30.030](#) Wetland Review Procedures.
- [18D.30.040](#) Wetland Standards.
- [18D.30.050](#) Mitigation Requirements.
- [18D.30.060](#) Buffer Requirements.
- [18D.30.070](#) Appendices.
  - A. [Wetland Categories.](#)
  - B. [Wetland Report Minimum Standards.](#)
  - C. [Mitigation Plan for Regulated Activities in Buffers.](#)
  - D. [Compensatory Mitigation Plan for Regulated Activities in Wetlands, Conceptual Phase.](#)
  - E. [Compensatory Mitigation Plan for Regulated Activities in Wetlands, Detailed Phase.](#)
  - F. [Wetland Buffer Widths](#)

#### [18D.30.080](#) Figures.

- Figure 18D.30-1 Connecting Mosaic Pattern Wetlands.
- Figure 18D.30-2 General Wetland Review.
- Figure 18D.30-3 Single-Family Wetland Review.
- Figure 18D.30-4 Wetland Buffer Averaging.

#### **18D.30.010 Purpose.**

The purpose of this Chapter is to avoid or, in appropriate circumstances, to minimize, rectify, reduce, or compensate for impacts arising from land development and other activities affecting wetlands, and to maintain and enhance the biological and physical functions and values of wetlands with respect to water quality maintenance, stormwater and floodwater storage and conveyance, fish and wildlife habitat, primary productivity, recreation, education, and historic and cultural preservation. When wetland impacts occur, mitigation shall be required to achieve no net loss of wetlands in terms of acreage, function, and value. These critical area provisions apply to any permitted activity if a wetland or its buffer is present on the subject property, or the proposed actions could result in adverse impacts to offsite wetlands and/or their buffers.

#### **18D.30.020 Wetland Areas.**

##### **A. General.**

1. Wetlands are those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions.
2. The City requires the use of the Washington State Wetlands Identification and Delineation Manual, March 1997 Edition ([DOE Publication #96-94](#)) as required pursuant to WAC 173-22-080 to determine the presence or absence of potential

wetlands. The Manual has incorporated all required items found in the [Federal Manual for Identifying and Delineating Jurisdictional Wetlands, Corps of Engineers Wetlands Delineation Manual, 1987 Edition](#) and corresponding guidance letters.

- B. **Wetland Indicators.** Indicators of wetlands normally include, but are not limited to: saturated soils or standing water; water-tolerant plant species such as salmonberry, Oregon ash, Western red cedar, rushes and sedges; and dark-brown or black soil colors. See [Ecology Publication #96-94](#) for detailed wetland indicator criteria.
- C. **Potential Wetland Areas.** Potential wetland areas, as depicted on the City's Critical Areas Wetland Inventory maps, are those areas where wetland indicators have been mapped or identified. Potential wetlands include:
  - 1. Areas within 315 feet of hydric soils identified on the Soil Survey of Thurston County area;
  - 2. Wetlands identified on the National Wetland Inventory maps or Tenino Wetland Inventory maps;
  - 3. Areas identified on the FEMA FIRM and Flood Insurance Study Maps as within the 100-year flood hazard areas;
  - 4. Indicators of hydrology such as Department of Natural Resource stream data;
  - 5. Areas that possess one or a number of wetland indicators as set forth in Section 18D.30.020 B and adjacent areas within 315 feet; or
  - 6. Areas within the buffer of any wetland previously identified through the wetland review process.
- D. **Wetland Categories.** Wetlands shall be classified into four (4) categories which are reflective of each wetland's function and value and unique characteristics. Wetland categories shall be based on the generalized criteria provided below and specifically detailed in 18D.30.070 - Appendix A. Wetlands shall be generally designated as follows:
  - 1. **Category I Wetlands.** Category I wetlands are those that:
    - a. Represent a unique or rare wetland type; or
    - b. Are more sensitive to disturbance than most wetlands; or
    - c. Are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime; or
    - d. Provide a high level of functions.
  - 2. **Category II Wetlands.** Category II wetlands are those regulated wetlands of significant resource value based on their functional value and diversity, wetland communities of infrequent occurrence, and other attributes which may not be adequately replicated through creation or restoration.
  - 3. **Category III Wetlands.** Category III wetlands are those regulated wetlands that have important resource value, principally due to vegetative diversity.
  - 4. **Category IV Wetlands.** Category IV wetlands are 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.
- E. **Wetland Delineation Criteria.**
  - 1. **Delineating Wetlands Divided by a Manmade Feature.** When a wetland is divided by a manmade feature (e.g., a road embankment), the wetland shall be rated as if it is not divided if there is a perennial or intermittent surface water connection between the two wetlands, such as a culver or bridge, and either of the following criteria are met:
    - a. It can be demonstrated that the separate wetlands were one discrete wetland prior to construction of the manmade feature. This may be accomplished through an analysis of secondary information such as aerial photographs and soils maps; or



- b. The two separated wetlands can be shown to function as one wetland. This shall be determined based on normal conditions (i.e., in the absence of unauthorized activity, the wetlands possess similar vegetative or wildlife assemblages or hydrologic regime).
  - c. Separated wetland areas may be rated jointly in the absence of a perfectly level culvert where it can be demonstrated that a level surface water connection is present within the culvert that permits flow of water, fish, or other organisms in both directions. Separated wetland areas may be rated jointly in the absence of a perfectly level culvert with two-way water flow if the bottom of the culvert is below the high water marks in the receiving wetland or if the high water marks on either side differ by six inches or less in elevation.
2. **Connecting Mosaic Pattern Wetlands.** In cases where the wetlands to be categorized are smaller than one acre in size and separated from each other by less than 100 feet (on average), the Ecology mosaic methodology shall be used to determine the wetland category. The area of the wetlands must be greater than 50 percent of the total combined area of wetland and upland for the patchwork to be categorized as one wetland. The boundary of the mosaic wetlands must reflect the ecological interconnectedness of the wetlands within the mosaic. The City will not accept mosaic boundaries drawn to minimize the area of wetland within the mosaic (see [Figure 18D.30-1](#)).

#### **18D.30.030 Wetland Review Procedures.**

##### **A. General Requirements.**

1. The City's Critical Areas Wetland map provides an indication of where potential wetlands are located within the City. The actual presence or location of a potential wetland that has not been mapped, but may be present on or adjacent to a site shall be determined using the procedures and criteria established in this Chapter.
2. The Department will complete a review of the City's Critical Areas Wetland map and other source documents for any proposed regulated activity to determine whether the project area for a proposed single-family dwelling unit or site for all other proposed regulated activities is located within a potential wetland. Identification of a potential wetland may also occur as a result of field investigations conducted by Department staff.
3. When Department maps, sources, or field investigations indicate that a potential wetland is located within the project area for a proposed single-family dwelling or within the site for all other proposed regulated activities, the Department shall require a site evaluation (field investigation) to determine whether or not a regulated wetland is present and if so, the relative location in relation to the proposed project area or site. The findings of the site evaluation shall be documented as outlined in 18D.30.030B and C below.
4. If Department staff completes the site evaluation and determines that no regulated wetlands are present, then wetland review will be considered complete.
5. All site evaluations shall include a proposed categorization of the wetland in accordance with the guidelines set forth in Section 18D.30.020 B and a calculation of the standard wetland buffer as set forth in Section 18D.30.060.
6. Unless otherwise stated in this Chapter, the critical area protective measure provisions contained in Section 18D.10.080 shall apply.
7. Copies of all studies, site visits and other relevant data provided to, or produced by the City, shall be provided to the County GIS department to facilitate the update of existing wetland digital data delineation boundaries.

B. **General Wetland Review.** A general wetland review shall include the submittal of a wetland verification report, wetland delineation report, or a wetland analysis report, together with a wetland application and appropriate fees (see [Figure 18D.30-2](#)).

1. **Wetland Verification Report.**

- a. A wetland verification report shall be submitted when the site evaluation determines that:
  - (1) No regulated wetland is present within 315 feet of the site; or
  - (2) A regulated wetland is present within 315 feet, but its standard buffer does not extend onto the site; or
- b. The wetland verification report shall include data sheets, site maps, and other field data and information necessary to confirm wetland presence or absence and category.
- c. The wetland verification report shall identify and discuss wetland boundaries within the site as well as those that extend offsite. Offsite wetlands and associated buffers do not have to be marked in the field.
- d. Department staff shall review the wetland verification report and either:
  - (1) Accept the report and approve the wetland application; or
  - (2) Reject the report and require the submittal of a wetland report.

3. **Wetland Report.**

- a. If a regulated wetland or buffer extends onto the site, the Department shall require a wetland report pursuant to 18D.30.070 Appendix B and the wetland shall be rated using the Wetland Rating Form for Western WA [Ecology Publication #04-06-025](#).
- b. If the Department determines that a Category I wetland is onsite which is associated with documented habitat for endangered, threatened, or sensitive species or for potentially extirpated plant species recognized by State or Federal agencies, the Department shall also require the submittal of a habitat assessment report as set forth in Chapter 18D.40.
- c. If the Department determines that mitigation is necessary to offset the identified impacts, the applicant shall comply with the mitigation requirements set forth in Section 18D.30.050.
- d. Approval of the wetland application shall be granted upon a determination that the wetland analysis report and mitigation plan, if applicable, are thorough and accurate, and meet all requirements of this Title, and that the monitoring program and contingency plan are tied to an acceptable financial guarantee as set forth in Section 18D.10.080 to assure that the requirements will be followed.

3. **Time Limitations.**

- a. **General.** Delineation reports and mitigation plans that have not been accepted by the City for a project are valid for a period of four (4) years unless a longer period is approved by the Department.
- b. **Extensions.** A one-year extension may be approved by the Department upon written request for such extension of that delineation report or mitigation plan.

C. **Single-Family Dwelling Wetland Review.** Two alternative review procedures exist for construction of a single-family dwelling and regulated activities accessory to a single-family dwelling (see [Figure 18D.30-3](#)). Both review procedures require the completion of a site evaluation as follows:

1. **Wetland Certification Process for Single-Family Dwellings (No Encroachment into a Regulated Wetland or Buffer).**

- a. Prior to issuance of a building permit, site development permit, or on-site sewage system permit, the applicant shall submit a single-family wetland certification form completed by a wetland specialist that certifies either:
    - (1) No regulated wetlands are present within 315 feet of the project area; or
    - (2) Wetlands are present within 315 feet of the project area, but all regulated activities associated with the dwelling (i.e., landscaped areas, septic facilities, outbuildings, etc.) will occur outside of the identified wetland buffer.
  - b. If regulated wetland buffers extend onto the site, the wetland specialist shall place permanent, clearly visible, wetland buffer signs at the edge of the buffer. The wetland specialist shall sign the wetland buffer sign affidavit to verify that the wetland buffer signs have been placed on site and provide a copy to the Department.
  - c. A survey as outlined in Section 18D.10.080 H will not be required.
  - d. The single-family certification form may be used only to authorize single-family dwellings and associated homesite features such as driveways, gardens, fences, wells, lawns, and on-site septic systems. It may not be used for new agricultural activities, expansion of existing agricultural activities, forest practice activities, commercial projects, land divisions, buffer width modifications (as set forth in Section 18D.30.060), or violations.
  - e. The single-family certification process will be monitored by the Department for accuracy, and enforcement actions will be initiated should encroachment into a regulated wetland or buffer occur.
  - f. The applicant/property owner assumes responsibility for any and all errors of the single-family certification form and all associated mitigation imposed by the Department.
  - g. Single-family certification forms shall be filed with the Thurston County Auditor's Office in accordance with Sections 18D.10.070 F and 18D.10.110 B.
2. **Single-Family Wetland Application Process (Encroachment into the Buffer of a Regulated Wetland).**
- a. A wetland application and wetland report (discussed in paragraph 3 below) shall be submitted to the Department when the single-family dwelling and associated homesite features are located within the buffer of a regulated wetland.
  - b. A wetland specialist shall delineate the limits of the regulated wetland and determine the impacts associated with the project and be submitted to the Department for review.
  - c. If the Department determines that mitigation is necessary to offset the identified impacts, the applicant shall comply with the mitigation requirements set forth in Section 18D.30.050.
  - d. The applicant shall place permanent, clearly visible, wetland boundary buffer signs at the edge of the buffer.
  - e. A survey as defined in Section 18D.10.080 H will not be required.
3. **Wetland Report.** A wetland report shall be in a form consistent with 18D.30.070 Appendix B.

**18D.30.040 Wetland Standards.** The following activities may be allowed within the standard buffers established pursuant to Section 18D.30.060, when mitigated according to Section 18D.30.50 A and B:

- A. New construction of a single-family residence; or the reconstruction, remodeling, or maintenance of an existing single-family residence, within an existing lot of record subject to the following:
  1. No more than one residential structure may be present within the lot.
  2. Both the size of the proposed home and the character and intensity of development are consistent with the surrounding area or are of lesser intensity.
  3. Impervious surface shall be limited to the minimum amount necessary to accommodate the proposed building site and, where possible, surfaces such as driveways and patios shall be made of pervious materials.
  4. The single-family residence must comply with applicable site development stormwater requirements.
  5. Any well and necessary appurtenances, including a pump and appropriately sized pump house, but not including a water storage tank (unless the water storage tank can be contained within the pump house), must comply with the following conditions:
    - a. The pump house is a one-story building with a ground area of less than 120 square feet; and
    - b. The well is more than 75 feet deep; and
    - c. Access to the well and pump house shall be by a pervious trail for pedestrian traffic only or, if necessary, by an unimproved access for a maintenance vehicle.
  6. In no case shall the Department allow development within a buffer to occur closer to a wetland boundary than 75 percent of the buffer size as determined through use of 18D.30.060 and Appendix F. An applicant who wishes to modify a buffer beyond these limits must pursue a variance as defined within Section 18D.20.060.
  7. The conversion from a single-family home to a multi-family use is prohibited.
- B. The above ground placement of utility lines not requiring excavation or utility pole installation in any part of a buffer for a Category II, III, or IV wetland. Utility lines may be placed in a buffer for a Category I wetland, provided that the minimum distance from the wetland edge is no less than 50 percent of the Category I buffer width established for the specific land use intensity type in table 18D.30-2 Land Use Impact Rating.
- C. An applicant that desires to remove trees or create a view corridor must complete a review as set forth in Section 18D.30.030 Wetland Review Procedures.
- D. Public trails and associated viewing platforms approved by the Department provided mitigation measures are employed.

#### **18D.30.050 Mitigation Requirements.**

- A. **Mitigation.** All regulated development activities in wetlands or buffers shall be mitigated according to this Title subject to the following order:
  1. Avoiding the impact altogether by not taking a certain action or parts of actions;
  2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation by using appropriate technology or by taking affirmative steps to reduce impacts;
  3. The following types of mitigation (in the following order of preference):
    - a. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
    - b. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;
    - c. Compensating for the impact by replacing or providing substitute resources or environments;

4. Monitoring the impact and compensation and taking appropriate corrective measures; and
  5. Mitigation for individual actions may include a combination of the above measures.
- B. **Mitigation for Regulated Activities in Wetland Buffers.** Non-compensatory mitigation shall be required for all regulated activities in buffers. Specific mitigation plan requirements are provided in Section 18D.30.070 - Appendix C. The Department shall notarize the approved mitigation plan, which shall refer to all requirements for the mitigation project.
- C. **Mitigation for Regulated Activities in Wetlands.** Compensatory mitigation shall be required for regulated activities that result in the loss of wetland acreage. Noncompensatory mitigation shall be required for regulated activities that do not result in the loss of wetland acreage. Specific mitigation plan requirements are provided in Section 18D.30.070 - Appendices D and E.
1. The compensatory mitigation plan shall be completed in two phases, a conceptual phase and a detailed phase.
    - a. Conceptual phase. The applicant shall submit to the Department a conceptual mitigation plan for compensatory mitigation. Where environmental review is required, the Department shall not make a threshold determination prior to Department review and approval of the conceptual mitigation plan. See 18D.30.070 - Appendix D for specific requirements of the conceptual mitigation plan.
    - b. Detailed phase. Following the Department's approval of the conceptual mitigation plan, the applicant shall submit a detailed mitigation plan for compensatory mitigation to the Department. See 18D.30.070 - Appendix E for specific requirements of the detailed mitigation plan.
  2. The detailed mitigation plan shall be prepared, signed, and dated by the wetland specialist to indicate that the plan is in accordance with specifications determined by the wetland specialist, and submitted to the Department.
  3. The Department shall notarize the approved detailed mitigation plan, which shall refer to all requirements for the mitigation project.
  4. The mitigation project shall be completed according to a schedule agreed upon between the Department and the applicant.
  5. Wetland mitigation shall occur according to the approved wetland mitigation plan and shall be consistent with provisions of this Chapter and Title.
  6. The wetland specialist shall be onsite during the construction and plant installation phases of all mitigation projects.
  7. The wetland specialist shall submit an as-built report to the Department for review and approval on completion of the wetland mitigation site development.
- D. **Wetland Mitigation Banking.** Wetland mitigation banking is authorized pursuant to the requirements of [90.84 RCW Wetlands Mitigation Banking](#) and provisions of [173-700 WAC](#) (Draft Rule). Additional information regarding this program may be found at the [Wetland Mitigation Banking](#) website.
- E. **Off-site Mitigation Allowed.** Offsite wetland mitigation is allowed, subject to the following conditions:
1. The off-site mitigation shall be within the same WRIA (23) basin.
  2. Be privately negotiated between affected site and proposed receiving mitigation site.
  3. Provide for like functions and values of the affected site and proposed receiving site.
  4. Provide means of protective measures specified in TMC 18D.10.080 Critical Area Protective Measures as agreed by the Department.

5. Encourage off-site mitigation projects to occur within the Scatter Creek corridor. The goal is to improve the degraded stream and associated wetland conditions along this watercourse. It is envisioned that overtime, and through voluntary cooperation, this approach will improve the overall functions and values, restore habitat opportunities, afford mitigation opportunities to lower functioning and less valuable wetland areas to maximize stream and wetland rehabilitation at the landscape perspective.

#### **18D.30.060 Buffer Requirements.**

- A. **Determining Buffer Widths.** Buffer widths shall be measured horizontally from a perpendicular line established at the wetland edge based on the Base Buffer Width identified in Table 18D.30-1 and adjustments in Appendix F:

**Table 18D.30-1 Base Buffer Widths**

Generalized Category of Wetland	Base Buffer Width
Category I	150 feet
Category II	100 feet
Category III	50 feet
Category IV	25 feet

**Table 18D.30-2 Land Use Impact Rating**

Impact Rating of proposed land use changes	Types of land uses that cause the impact based on common zoning categories
High	Commercial, Urban, Industrial, Institutional, Retail Sales, Residential with more than 1 unit/acre, New agriculture (high- intensity processing such as dairies, nurseries and green houses, raising and harvesting crops requiring annual tilling, raising and maintaining animals), High intensity recreation (golf courses, ball fields), hobby farms
Moderate	Residential with 1unit/acre or less, Moderate -Intensity Open Space (parks), New agriculture (moderate- intensity such as orchards and hay fields)
Low	Forestry, Open space (low-intensity such as passive recreation and natural resources preservation)

- B. **Modification of Buffer Widths.** The standard buffer widths of Section 18D.30.060A may be decreased through the averaging or reduction mechanisms of this section. The standard buffer width may also be increased.
  1. **Standard Conditions.** The buffer widths recommended for land uses with “high intensity” impacts to wetlands can be reduced to those recommended for "moderate intensity" impacts under the conditions identified below.
    - a. For wetlands that score moderate or high for habitat (20 points or more using [Ecology Publication #04-06-025](#) rating form), the width of the buffer around the wetland can be reduced to the next lower buffer width if both the following conditions are met:
      - (1) A relatively undisturbed vegetated corridor at least 100 feet wide is protected between the wetland and any other Priority Habitats as defined by the Washington State Department of Fish and Wildlife. The corridor must be

- protected for the entire distance between the wetland and the Priority Habitat via some type of legal protection such as a conservation easement; and
- (2) Measures to minimize the impacts of different land uses on wetlands, as summarized in the following table, are applied.

**Table 18D.30-3 Disturbance Examples**

Examples of Disturbance	Examples of Measures to Minimize Impacts	Activities that Cause the Disturbance
Lights	Direct lights away from wetland	Parking Lots, Warehouses, Manufacturing, High Density Residential
Noise	Place activity that generates noise away from wetland.	Manufacturing, High Density Residential
Toxic runoff	Route new untreated runoff away from wetland, Covenants limit use of pesticides within 150 ft of wetland, Integrated pest management programs	Parking Lots, Roads, Manufacturing, Residential Areas, Application of Agricultural Pesticides, Landscaping
Water regime change	Infiltrate or treat, detain & disperse new runoff from surfaces into buffer	Any impermeable surface, Lawns, Tilling
Pets and Human disturbance	Fence buffer, Plant buffer with "impenetrable" natural vegetation appropriate for region	Residential areas
Dust	BMP's for dust	Tilled fields

- b. For wetlands that score less than 20 points for habitat, the buffer width can be reduced to those required for moderate land use impacts if measures from the above table are also applied to the project to minimize the impacts of different land use intensities to the wetland.
2. **Buffer Averaging.** Buffer width averaging may be allowed only where the applicant demonstrates all of the following:
  - a. The decrease in buffer width is minimized by limiting the degree or magnitude of the regulated activity.
  - b. A habitat assessment has been submitted which demonstrates that no documented habitat for endangered, threatened, or sensitive fish, or animal species is present; or
  - c. For wetlands and/or required buffers associated with documented habitat for endangered, threatened, or sensitive fish, or wildlife species, a habitat assessment report has been submitted that demonstrates that the buffer modification will not result in an adverse impact to the species of study.
  - d. Width averaging will not adversely impact the wetland.
  - e. The total buffer area after averaging is no less than the buffer area prior to averaging (see Figure 18D.30-4).
  - f. The minimum buffer width will not be less than 75 percent of the widths established after the categorization is done and any buffer adjustments applied.
  - g. The averaging is accomplished within the project boundaries or through an offsite conservation easement or tract (or other acceptable protective mechanism) approved by the Department.
3. **Buffer Increases.** The Department may require increased buffer width(s) when any of the following are identified:
  - a. A larger buffer is necessary to maintain viable populations of existing species;



- b. The wetland is used by, or associated with, species listed by the Federal government or the State as endangered, threatened, sensitive, or as documented priority species or habitats, or essential or outstanding potential sites such as heron rookeries or raptor nesting areas;
  - c. The adjacent land is susceptible to severe erosion and erosion control measures will not effectively prevent adverse wetland impacts;
  - d. The adjacent land has minimal vegetative cover or slopes greater than 20 percent.
- C. If buffer width averaging is utilized and significant trees are identified on the outer edge of the reduced buffer such that their drip line extends beyond the buffer edge, the following tree protection requirements must be followed:
  - 1. A tree protection area shall be designed to protect each tree or tree stand during site development and construction. Tree protection areas may vary widely in shape, but must extend a minimum of five feet beyond the existing tree canopy area along the outer edge of the dripline of the tree(s), unless otherwise approved by the Department.
  - 2. Tree protection areas shall be added and clearly labeled on all applicable site development and construction drawings, submitted to the Department.
  - 3. Temporary construction fencing at least 30 inches tall shall be erected around the perimeter of the tree protection areas prior to the initiation of any clearing or grading. The fencing shall be posted with signage clearly identifying the tree protection area. The fencing shall remain in place through site development and construction.
  - 4. No clearing, grading, filling or other development activities shall occur within the tree protection area, except where approved in advance by the Department and shown on the approved plans for the proposal.
  - 5. No vehicles, construction materials, fuel, or other materials shall be placed in tree protection areas. Movement of any vehicles within tree protection areas shall be prohibited.
  - 6. No nails, rope, cable, signs, or fencing shall be attached to any tree proposed for retention.
  - 7. The Department may approve the use of alternate tree protection techniques if an equal or greater level of protection will be provided.

**18D.30.070 Appendices.**

- A. [Wetland Categories.](#)
- B. [Wetland Report Minimum Standards.](#)
- C. [Mitigation Plan for Regulated Activities in Buffers.](#)
- D. [Compensatory Mitigation Plan for Regulated Activities in Wetlands, Conceptual Phase.](#)
- E. [Compensatory Mitigation Plan for Regulated Activities in Wetlands, Detailed Phase.](#)
- F. [Wetland Buffer Widths.](#)

**18D.30.080 Figures.**

- [Figure 18D.30-1 Connecting Mosaic Pattern Wetlands.](#)
- [Figure 18D.30-2 General Wetland Review.](#)
- [Figure 18D.30-3 One-Family Wetland Review.](#)
- [Figure 18D.30-4 Wetland Buffer Averaging.](#)



## 18D.30.070 Appendices.

### APPENDIX A WETLAND CATEGORIES

Wetland categories shall be designated according to the following generalized criteria:

**A. Category I.** Category I wetlands are:

8. Relatively undisturbed estuarine wetlands larger than 1 acre;
9. Wetlands that are identified by scientists of the Washington Natural Heritage Program/DNR as high quality wetlands;
10. Bogs larger than ½ acre;
11. Mature and old growth forested wetlands larger than 1 acre;
12. Wetlands in coastal lagoons; and
13. Wetlands that perform many functions well.

These wetlands are those that:

1. Represent a unique or rare wetland type; or Are more sensitive to disturbance than most wetlands; or
2. Are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime; or
3. Provide a high level of functions.

**B. Category II.** Category II wetlands are:

1. Estuarine wetlands smaller than 1 acre, or disturbed estuarine wetlands larger than 1 acre;
2. A wetland identified by the Washington State Department of Natural Resources as containing “sensitive” plant species;
3. A bog between ¼ and ½ acre in size;
4. An interdunal wetland larger than 1 acre; or
5. Wetlands with a moderately high level of functions.

**C. Category III.** Category III wetlands are

1. Wetlands with a moderate level of functions (scores between 30 and 50 points) and
2. Interdunal wetlands between 0.1 and 1 acre in size. Wetlands scoring between 30 and 50 points generally have been disturbed in some ways, and are often less diverse or more isolated from other natural resources in the landscape than Category II wetlands.

**D. Category IV.** Category IV wetlands have the lowest levels of functions (scores less than 30 points) and are often heavily disturbed. These are wetlands that we should be able to replace, and in some cases be able to improve. However, experience has shown that replacement cannot be guaranteed in any specific case. These wetlands may provide some important functions, and should be protected to some degree.

\*NOTE: The Category of a wetland shall not be changed to recognize illegal modifications to the wetland.

## **18D.30.070 Appendices.**

### **APPENDIX B**

#### **WETLAND REPORT MINIMUM STANDARDS**

The written report and accompanying plan sheets shall contain the following minimum information:

- A. Vicinity map and detailed driving instructions to the site;
- B. A site map setting forth all of the following:
  - 1. Surveyed wetland boundaries based upon a delineation by a wetlands specialist (Note: this information may also be submitted in a digital format, which is designated as acceptable by the City);
  - 2. Wetlands and buffers offsite, within 315 feet of the site boundaries, are also to be discussed and shown in as much detail as possible;
  - 3. Site boundary property lines and roads;
  - 4. A north arrow and scale;
  - 5. Internal property lines, rights-of-way, easements, etc.;
  - 6. Existing physical features of the site including buildings, fences, and other structures, roads, parking lots, utilities, water bodies, etc.;
  - 7. Contours at the smallest readily available intervals, preferably at two-foot intervals;
  - 8. Hydrologic mapping showing patterns of surface water movement and known subsurface water movement into, through, and out of the site area; and
  - 9. Location of all test holes and vegetation sample sites, and wetland boundary flags numbered to correspond with flagging in the field and field data sheets.
- C. A report which includes the following:
  - 1. Location information (legal description, parcel number, and address);
  - 2. Delineation analysis results. The wetland boundaries on the site established by the delineation shall be staked and flagged in the field. If the wetland extends outside the site, the delineation report shall discuss all wetland areas within 300 feet of the site, but need only delineate those wetland boundaries within the site;
  - 3. General site conditions including topography, acreage, and surface areas of all wetlands identified in the Wetland maps and water bodies within one-quarter mile of the subject wetland(s);
  - 4. Hydrological analysis, including topography of existing surface and known significant sub-surface flows into and out of the subject wetland(s); and
  - 5. Discussion of the values of existing wetlands, including vegetative, faunal, and hydrologic conditions and the presence of threatened, endangered, candidate, sensitive or monitor species;
- D. A summary of the proposed activity and potential direct or indirect impacts to the wetland(s) including stormwater-related impacts to wetland hydrology;
- E. Recommended wetland category, including rationale for the recommendation;
- F. Recommended buffer boundaries, including rationale for boundary locations;
- G. Proposed on-site residential density transfer from wetlands and/or buffers to upland areas;
- H. Site plan of proposed activity, including location of all parcels, tracts, easements, roads, structures, and other modifications to the existing site. The location of all wetlands and buffers shall be identified on the site plan.
- I. The wetland analysis report shall be signed and dated by the wetland specialist.

**18D.30.070 Appendices.**

**APPENDIX C**

**MITIGATION PLAN FOR REGULATED ACTIVITIES IN BUFFERS**

- A. A mitigation plan for regulated activities in buffers shall be prepared, signed, and dated by a wetland specialist and shall contain the following:
  - 1. General goals of the mitigation plan including a discussion of the function and values of impact and enhancement areas;
  - 2. Approximated site topography before and after alteration;
  - 3. Location of proposed mitigation area (include a north arrow and scale);
  - 4. General hydrologic patterns on the site before and after construction;
  - 5. General plant selection and justification, planting instructions, and approximate planting sequencing and schedule;
  - 6. A maintenance plan;
  - 7. A monitoring and contingency plan with a five year monitoring period.
  - 8. Estimated costs for the installation, maintenance, and monitoring phases of the project. Separate estimates shall be prepared for the installation phase and monitoring and maintenance phase of the project; and
  - 9. Address and phone number of person or organization responsible for monitoring requirements.
- B. Upon Department review and approval of this plan, it shall become the detailed plan.

## **18D.30.070 Appendices.**

### **APPENDIX D**

#### **COMPENSATORY MITIGATION PLAN FOR REGULATED ACTIVITIES IN WETLANDS - CONCEPTUAL PHASE**

- A. The conceptual phase of a mitigation plan for regulated activities in wetlands shall be prepared, signed, and dated by a wetland specialist and shall include the following:
  - 1. General goals of the compensatory mitigation plan, including an overall goal of no net loss of wetland function, value, and acreage;
  - 2. Mitigation projects that involve Category I wetlands associated with documented habitat for endangered or threatened plant, fish, or animal species or for potentially extirpated plant species recognized by State or Federal agencies must also demonstrate a net benefit to the conservation of the affected species;
  - 3. Site topography before and after construction;
  - 4. Location of proposed wetland mitigation area;
  - 5. General hydrologic patterns on the site before and after construction;
  - 6. Field data confirming the presence of adequate hydrology to support the existing and created wetland area(s). At a minimum, the following information shall be included:
    - a. Seasonal (growing season) water level;
    - b. Sources of water (if the water source is adjacent to a stream or river then no in-stream structures will be allowed that restrict fish migration or access);
    - c. Pre- and post-development inflow and outflow volumes and velocity and frequency of flooding;
    - d. Groundwater and surface water table. (from "Guidelines for Developing Freshwater Wetlands Mitigation Plans and Proposals," 1994, COE, EPA, DOE, USFWS, WDFW);
  - 7. Nature of mitigation, including wetland types (in-kind and out-of-kind), general plant selection and justification, approximate project sequencing and schedule, and approximate size of the new wetland buffer. A discussion of the function and values of both the impact and creation areas is also to be provided;
  - 8. A conceptual maintenance plan; and
  - 9. Conceptual monitoring and contingency plan.
- B. Once the Department approves the conceptual mitigation plan, a detailed mitigation plan shall be submitted. Due to the complex nature of creating and restoring wetlands, very detailed plans are needed (See 18D.30.070 - Appendix E for further information on detailed mitigation plans).

**APPENDIX E**

**COMPENSATORY MITIGATION PLAN FOR REGULATED  
ACTIVITIES IN WETLANDS - DETAILED PHASE**

**I. General Requirements.**

The detailed mitigation plan shall contain the following:

- A. Site specific, quantifiable criteria for evaluating whether or not the goals for the proposed compensation are being met. Such criteria shall include the establishment of viable plant communities, hydric soil formation, and establishment of wetland hydrology, and may include water quality standards, species abundance and diversity targets, habitat diversity indices, or other ecological, geological, or hydrological criteria (see Subsection III. below for specific performance standards).
- B. Pre-development analysis of the proposed compensation area including:
  - 1. Existing vegetation community analysis;
  - 2. Hydrological analysis that demonstrates the project will not adversely impact existing wetland and buffer areas and that ensures adequate hydrology for any created wetland areas (see Subsection V for specific requirements);
  - 3. Onsite soils analysis data and, where appropriate, Natural Resources Conservation Service Mapping;
  - 4. Detailed description of flora and fauna existing on the site; and
  - 5. Description of existing site conditions in relation to historic conditions for those sites which have been recently altered or degraded.
- C. Proposed post-development conditions within existing wetland and buffer areas and mitigation areas, including:
  - 1. Relationship of the project to the watershed and existing water bodies;
  - 2. Topography, using one-foot contour intervals;
  - 3. Hydrologic analysis (see Subsection V. for specific requirements);
  - 4. Grading, filling, and excavation, including a description of imported soils;
  - 5. Irrigation requirements;
  - 6. Erosion control measures during construction; and
  - 7. Areal coverage of planted areas to open water areas if any open water is to be present.
- D. Detailed site diagrams, to-scale construction drawings with cross-section data, topographic maps showing slope percentage and final grade elevations, and any other drawings appropriate to show construction techniques or anticipated final outcome. The plan shall provide for elevations which are appropriate for the desired habitat type(s). The construction drawings must include a note that requires the contractor to refer to the approved mitigation plan.
- E. Planting plan prepared by a wetland specialist that shall include the following:
  - 1. Soils and substrate characteristics;
  - 2. Specification of substrate stockpiling techniques;
  - 3. Planting instructions, including species, stock type and size, density or spacing of plants, and water and nutrient requirements; and

4. Specification of where plant materials will be procured. Documentation shall be provided which guarantees plant materials are to be procured from licensed regional nurseries or from wetlands on site which are part of the mitigation plan.
- F. Schedule showing dates for beginning and completing the mitigation project, including a sequence of construction activities.
- G. Monitoring and maintenance plan which includes the following:
  1. Specification of procedures for monitoring and site maintenance; and
  2. Schedule for submitting monitoring reports.
- H. Detailed contingency plan, consistent with Subsection IV below.
- I. Detailed budget for implementing the mitigation plan, including construction, monitoring, maintenance, and contingency phases.
- J. Financial guarantee for the work to be performed as planned and approved. Separate guarantee estimates shall be prepared for the installation phase and monitoring and maintenance phase of the project.
- K. Address and phone number of the person or organization responsible for monitoring requirements.

## **II. Location Criteria.**

In cases in which it is determined that compensatory mitigation is appropriate, the following shall apply:

- A. Compensatory mitigation shall be provided on-site, except where the applicant demonstrates that on-site mitigation is not scientifically feasible or practical due to physical features of the site.
- B. When compensatory mitigation cannot be provided on-site, it shall be provided in the immediate vicinity of and within the same watershed as the regulated activity.

## **III. Mitigation Performance Standards.**

- A. When regulated activities occur in wetlands, the applicant shall restore, create, or enhance equivalent areas of wetlands. Equivalent areas shall be determined according to acreage, functional value, type, location, time factors, and projected success. No overall net losses shall occur in wetland acreage, functions and/or values, and any restored, created, or enhanced wetland shall be as persistent as the wetland it replaces.
- B. When an applicant proposes to alter or eliminate wetland, the applicant shall replace acreage at the following ratios:

Category I: 6:1 (acreage replacement: acreage lost)

Category II: 3:1

Category III: 2:1

Category IV: 1.5:1

- C. Ratios provided are for proposed projects with on-site, in-kind replacement which occurs prior to regulated activities on the site. The Department may increase the ratios under the following circumstances:
  1. Uncertainty as to the probable success of the proposed restoration or creation; or
  2. Significant period of time between destruction and replication of wetland functions; or
  3. Projected losses in wetland functions and value; or

4. Off-site and/or out-of-kind compensation.
- D. The Department may allow enhancement of existing or created wetland area(s) as a means of reducing the standard acreage replacement ratio if the applicant demonstrates that no net loss of wetland function or value will result provided that:
  1. Enhancement mitigation ratios shall be no less than twice the standard creation ratio of the impacted wetland.
  2. The applicant may be required to complete an analysis of the impact and mitigation areas in support of the acreage replacement ratio reduction. An example of an acceptable analysis methodology is the Washington State Department of Ecology Wetland Function Assessment Methodology (Ecology Publication # 99-116); however, other methodologies may be proposed.
  3. The City will not allow the acreage replacement ratio to be reduced to less than 1:1 except as described in III-E below.
- E. In the case of Category II, III, and IV wetlands, the replacement ratio may be decreased to a ratio of less than 1:1 if, following a public hearing, the Planning Commission determines the following:
  1. A replacement ratio of greater than 1:1 is either not feasible on-site or would be likely to result in substantial degradation of other natural features; and
  2. The mitigation plan shows that a net increase in wetland functional values will result from the mitigation; and
  3. The mitigation is completed, and then monitored by the Department for one year prior to the issuance of permits. If after one year of monitoring, the Department is not satisfied that the anticipated final outcome of the mitigation plan will be met, modifications to the mitigation plan and further monitoring may be required. When the Department is satisfied that the mitigation will be successful, permits pending will be issued.
- F. In-kind compensation shall be provided except where the applicant demonstrates that:
  1. Greater functional and habitat values can be achieved through out-of-kind mitigation; and
  2. The wetland system is already significantly degraded; or
  3. Problems such as the presence of exotic vegetation and changes in watershed hydrology make implementation of in-kind compensation infeasible; or
  4. Out-of-kind replacement will best meet identified regional goals (e.g., replacement of historically diminished wetland types).
- G. Design requirements for the mitigation plan shall, at a minimum, include the following:
  1. Use only native plants indigenous to Thurston County (not introduced or exotic species);
  2. Use plants appropriate to the depth of water at which they will be planted;
  3. Use plants that originate and are available from local sources;
  4. Use plant species high in food and cover value for fish and wildlife;
  5. Plant mostly perennial species;
  6. Avoid committing significant areas of site to species that have questionable potential for successful establishment;
  7. Water depth is not to exceed 6.5 feet (2 meters);
  8. The grade or slope that water flows through the wetland is not to exceed six percent;
  9. Slopes within the wetland and buffer should not be steeper than 3:1 (horizontal to vertical);
  10. Planting densities and placement of plants shall be shown on the design plans;
  11. The wetland should not contain more than 60 percent open water as measured at the seasonal high water mark;

12. Stockpiling shall be confined to upland areas and contract specifications should limit stockpile durations to less than four weeks. Erosion control measures shall be in effect at the stockpiling location;
  13. Planting instructions shall describe proper placement, diversity, and spacing of seeds, tubers, bulbs, rhizomes, sprigs, plugs, cuttings, and transplanted stock;
  14. Apply controlled release fertilizer at the time of planting and afterward only as plant conditions warrant (determined during the monitoring process), and only to the extent that the release would be conducted in an environmentally sound manner;
  15. Install an irrigation system, as necessary, until plants are established.
- H. Mitigation projects are unique and performance standards will differ based upon the goals and objectives of the project. However, performance standards pertaining to water regime, vegetative structure and establishment, and hydric soil formation are to be established for all mitigation projects, as defined below:
1. The mitigation wetland must meet the technical criteria for wetland hydrology, seasonal inundation, and/or saturation to the surface for a consecutive number of days greater than or equal to 12.5 percent of the growing season. Areas that are seasonally inundated and/or saturated to the surface for a consecutive number of days between 5 percent and 12.5 percent of the growing season may also be wetlands. Hydrology may be monitored through the use of one or a combination of the following: groundwater wells, piezometers, crest gauges, hand-dug soil pits, staff gauges, and continuous recording flow meters.
  2. At a minimum, vegetative success equals the establishment of a multi-species, mixed canopy community comprised of emergent, scrub-shrub, and tree species. Yearly standards pertaining to survival and aerial coverage shall also be established for each vegetative stratum.
  3. Hydric soil characteristics shall be monitored through the use of one or a combination of the following: Munsell soil color, pH, particle size, redox potential, organic content, microbial activity, time and duration of saturation or ponding, and alkalinity.

#### **IV. Monitoring Program and Contingency Plan**

- A. A contingency plan shall be established for compensation in the event the mitigation project is inadequate or fails. The contingency plan is to provide specific corrective measures for such common mitigation plan failings as plant mortality, vandalism, damage due to wildlife grazing, grading errors, and hydro-regime problems. A financial guarantee on a form acceptable to the City is required for the duration of the monitoring period, and the guarantee plus any accrued interest will be released by the City when the required mitigation and monitoring are completed. To determine the amount of the financial guarantee, an estimate shall be submitted to the City detailing the work to be accomplished and the cost thereof. The estimate shall be based on current costs. The City will review the estimate and, if acceptable, will establish the financial guarantee at 125 percent of the estimate to allow for inflation and administration expenses should the City have to complete the project.
- B. Requirements of the monitoring program are as follows:
1. Scientific procedures are to be used for establishing the success or failure of the project.
  2. Monitoring reports prepared by a wetland specialist are to be submitted for Department review. Monitoring reports shall include discussions of wildlife utilization of the site, vegetation establishment, water quality, water flow, stormwater storage and conveyance, and existing or potential degradation, according to the following schedule:



- a. At completion of construction of mitigation project (as-built report);
  - b. Thirty days after completion;
  - c. Early in the first growing season after construction;
  - d. End of the first growing season after construction;
  - e. Twice the second year; and
  - f. Annually after the second year.
3. Monitor for a period of time appropriate to the nature of the project (single-family versus commercial) and the complexity of the mitigation project. The majority of monitoring programs will last a minimum of five years.
  4. The City will require a Right of Entry pursuant to TMC 18D.10.070F2.
  5. Correct for failures in the mitigation project.
  6. Replace dead or undesirable vegetation with appropriate plantings.
  7. Repair damages caused by erosion, settling, or other geomorphological processes.
  8. If necessary, redesign mitigation project and implement the new design.
  9. Correction procedures shall be approved by a wetland specialist and the Department.

## **V. Hydrology Monitoring Guidelines**

- A. Applicants are required to ensure that the proposed development does not result in adverse impacts to regulated wetland and/or buffers. To achieve this, an applicant must demonstrate the project will not adversely affect the wetland hydroperiod. To determine existing hydroperiod, use one of the following methods, listed in order of preference:
  1. For Category I, II, III, and forested Category IV wetlands:
    - a. Estimation by a continuous simulation computer model. The model should be calibrated with at least one year of data taken using a continuously recording level gage under existing conditions and should be run for the historical rainfall period. Acceptable computer models include [HSPE](#), [KCRTS](#), or Department of Ecology [WWHM](#). The resulting data can be used to express the magnitudes of depth fluctuation, as well as the frequencies and durations of surpassing given depths.
    - b. Measurement during a series of time intervals (no longer than one month in length) over a period of at least one year of the maximum water stage, using a crest stage gage, and instantaneous water stage, using a staff gage.
  2. The resulting data can be used to express water level fluctuation (WLF) during the interval as follows: Average base stage = (instantaneous stage at beginning of interval + instantaneous stage at end of interval)/2 WLF = Crest stage - Average base stage
  3. Compute mean annual and mean monthly WLF as the arithmetic averages for each year and month for which data are available.
  4. For scrub-shrub and emergent Category IV wetlands a single-event model may be used to ensure that there is no change in the volume of water delivered to the wetland under post-development conditions.
- B. To forecast future hydroperiod, complete an estimate by the continuous simulation computer model calibrated during pre-development analysis and run for the historical rainfall period. The resulting data can be used to express the magnitudes of depth fluctuation, as well as the frequencies and durations of surpassing given depths. [Note: Post-development modeling results should generally be compared with pre-development modeling results, rather than directly with field measurements, because different sets of assumptions underlie modeling and monitoring. Making pre- and post-development comparisons on the basis of common assumptions allows cancellation of errors inherent in the assumptions.]

- C. A hydroperiod analysis is to be used to ensure that the following hydroperiod limits are met:
1. Mean annual WLF (and mean monthly WLF for every month of the year) does not exceed 20 cm. Vegetation species richness decrease is likely with: (1) a mean annual (and mean monthly) WLF increase of more than 5 cm (2 inches or 0.16 ft) if predevelopment mean annual (and mean monthly) WLF is greater than 15 cm, or (2) a mean annual (and mean monthly) WLF increase to 20 cm or more if pre-development mean annual (and mean monthly) WLF is 15 cm or less.
  2. The frequency of stage excursions of 15 cm above or below pre-development stage does not exceed an annual average of six.
  3. The duration of stage excursions of 15 cm above or below pre-development stage does not exceed 72 hours per excursion.
  4. The total dry period (when pools dry down to the soil surface everywhere in the wetland) does not increase or decrease by more than two weeks in any year.
  5. The following hydroperiod limits characterize wetlands inhabited by native amphibians listed as regulated wildlife species in Section 18D.40 and apply to breeding zones during the time period of February 1st through May 31st. (Note: If these limits are exceeded, then amphibian breeding success is likely to decline).
    - a. The magnitude of stage excursions above or below the pre-development stage does not exceed 8 cm, and the total duration of these excursions does not exceed 24 hours in any 30-day period.
    - b. To apply this guideline a continuous simulation computer model needs to be employed. The model should be calibrated with data taken under existing conditions at the wetland being analyzed and then used to forecast post-development magnitude and duration of excursions.

## APPENDIX F

## Wetland Buffer Widths

**Table 1: Width of buffers needed to protect Category I wetlands.**

Wetland Characteristics	Buffer Widths Adjustments to 150 ft base width (by impacts of land use/apply most protective)	Other Protection
Natural Heritage Wetlands	Low - Decrease by 25 ft Moderate – Increase by 40 ft High – Increase by 100 ft	No additional discharges of surface water. No septic systems within 300 ft. Restore degraded parts of buffer.
Bogs	Low - Decrease by 25 ft Moderate – Increase by 40 ft High – Increase by 100 ft	No additional surface discharges. Restore degraded parts of buffer.
Forested	Buffer size to be based on score for habitat functions or water quality functions	If forested wetland scores high for habitat need to maintain connectivity to other natural areas. Restore degraded parts of buffer
High level of function for habitat score is 29-36 pts.	Low – No Change Moderate – Increase by 75 ft High – Increase by 150 ft	Maintain connectivity to other natural Areas. Restore degraded parts of buffer
Moderate level of function for habitat score is 20 - 28 pts.)	Low – Decrease by 75 ft Moderate – Decrease by 40 ft High – No change	N/A
High level of function for water quality improvement (score for WQI is 24-32) and low for habitat, less than 20 points)	Low – Decrease by 100 ft Moderate – Decrease by 75 ft High – Decrease by 50 ft	No additional discharges of untreated runoff
Category I wetlands not meeting any of the above criteria	Low – Decrease by 100 ft Moderate – Decrease by 75 ft High – Decrease by 50 ft	N/A

**APPENDIX F**  
**Wetland Buffer Widths - Continued**

**Table 2: Width of buffers needed to protect Category II wetlands.**

Wetland Characteristics	Buffer Widths Adjustments to 100 ft base width (by impact of land use/apply most protective)	Other Protection
High level of function for habitat score is 29-36 pts.	Low - Increase by 50 ft Moderate – Increase by 125 ft High – Increase by 200 ft	Maintain connectivity to fish and wildlife species and habitat areas
Moderate level of function for habitat score is 20 - 28 pts.	Low - Decrease by 25 ft Moderate – Increase by 10 ft High – Increase by 50 ft	N/A
High level of function for water quality improvement and low for habitat (score water quality is 24-32 pts and habitat is less than 20)	Low - Decrease by 50 ft Moderate – Decrease by 25 ft High – No change	No additional discharges of untreated runoff
Cat II not meeting above criteria	Low - Decrease by 50 ft Moderate – Decrease by 25 ft High – No Change	N/A

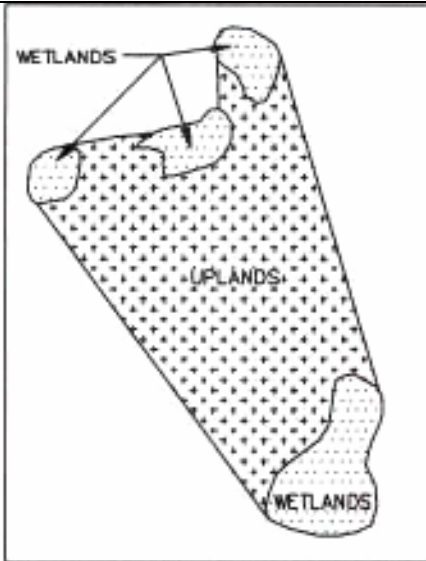
**Table 3: Width of buffers needed to protect Category III wetlands.**

Wetland Characteristics	Buffer Widths Adjustments to 50 ft base width (by impact of land use)	Other Protection
Moderate level of function for habitat score is 20 - 28 pts.	Low - Increase by 25 ft Moderate – Increase by 60 ft High – Increase by 100 ft	N/A
Not meeting above criteria	Low - Decrease by 10 ft Moderate – No change High – Increase by 30 ft	N/A

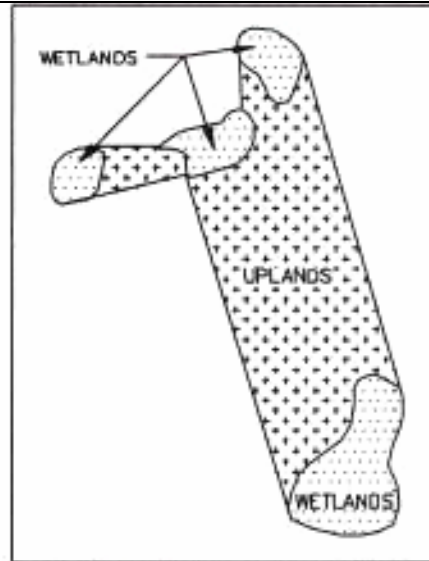
**Table 4: Width of buffers needed to protect Category IV wetlands.**

Wetland Characteristics	Buffer Width Adjustment to 25 ft base width (based on impact of land use)	Other Protection
Score for functions < 30 points	Low - No change Moderate – No change High – Increase by 25 feet	N/A

**NOTE: If the wetland meets more than one of the criteria listed in each table, the buffer needed to protect the wetland is the widest one.**

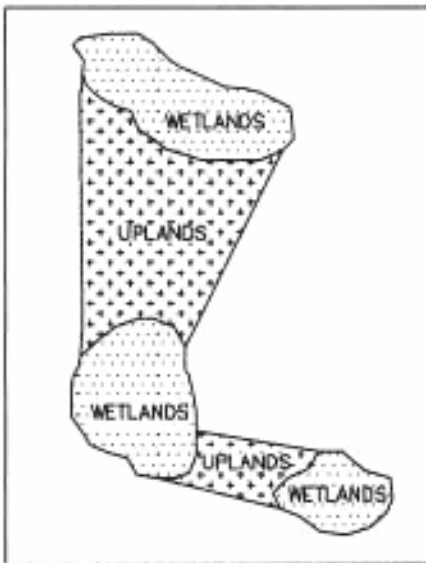


UNACCEPTABLE METHOD OF CONNECTING  
MOSAIC PATTERN WETLANDS

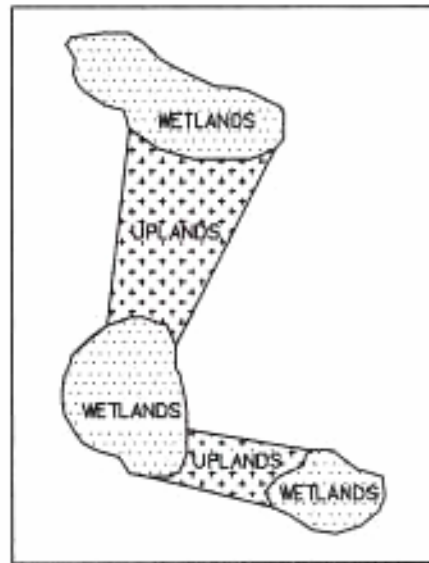


ACCEPTABLE METHOD OF CONNECTING  
MOSAIC PATTERN WETLANDS

### EXAMPLE ONE



UNACCEPTABLE METHOD OF CONNECTING  
MOSAIC PATTERN WETLANDS



ACCEPTABLE METHOD OF CONNECTING  
MOSAIC PATTERN WETLANDS

### EXAMPLE TWO

## CONNECTING MOSAIC PATTERN WETLANDS

N.T.S.



**City of Tenino**  
Community Development Department  
149 S. Hodgden  
Tenino, WA 98589 (360) 264-2368

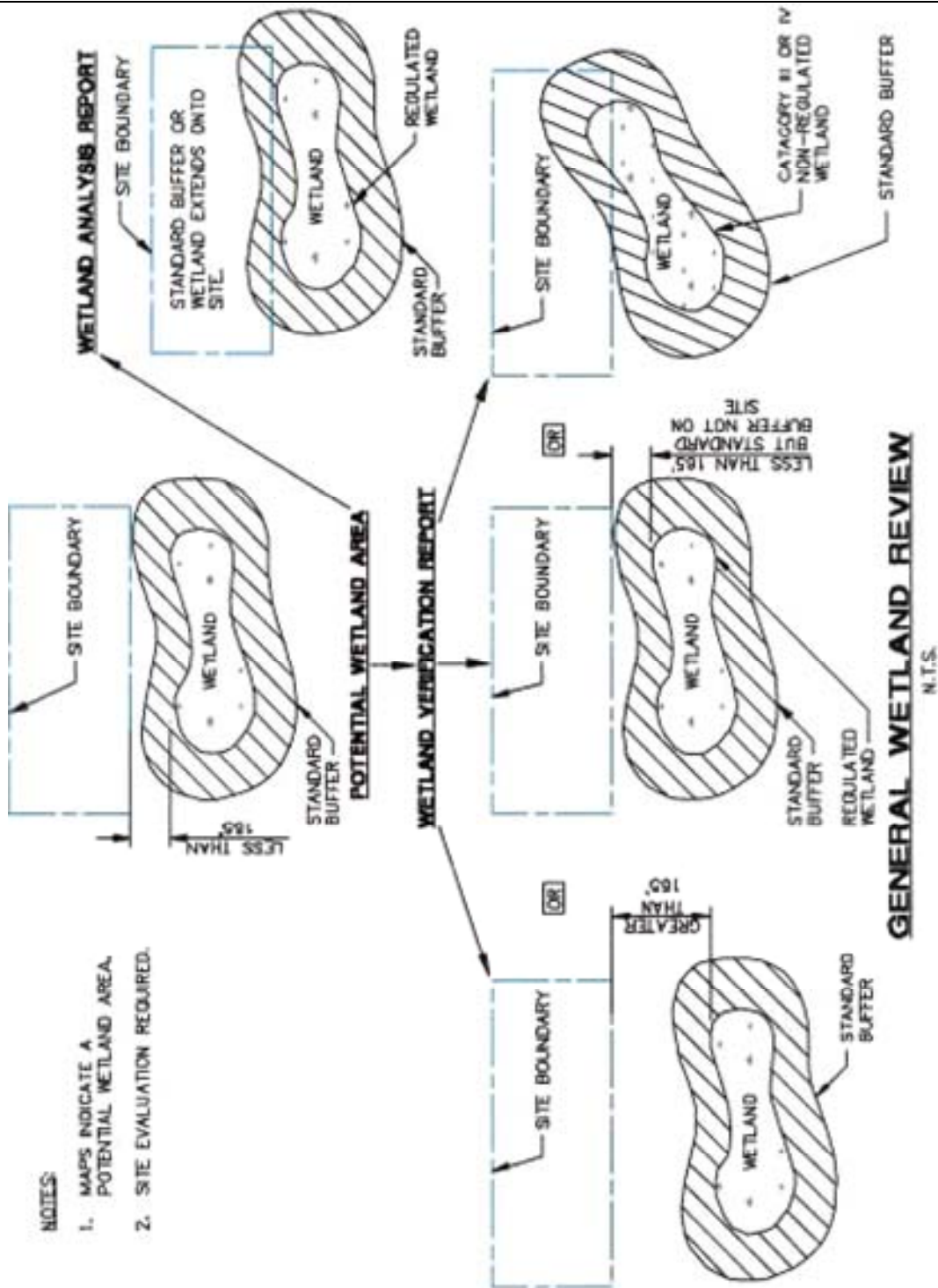
## CONNECTING MOSAIC PATTERN WETLANDS

Copied By: DOC

Adopted by: Ord. No. 710

Effective Date: May 2, 2005

FIGURE 18D.30-1



**City of Tenino**  
Community Development Department  
149 S. Hodgden  
Tenino, WA 98589 (360) 264-2368

## GENERAL WETLAND REVIEW

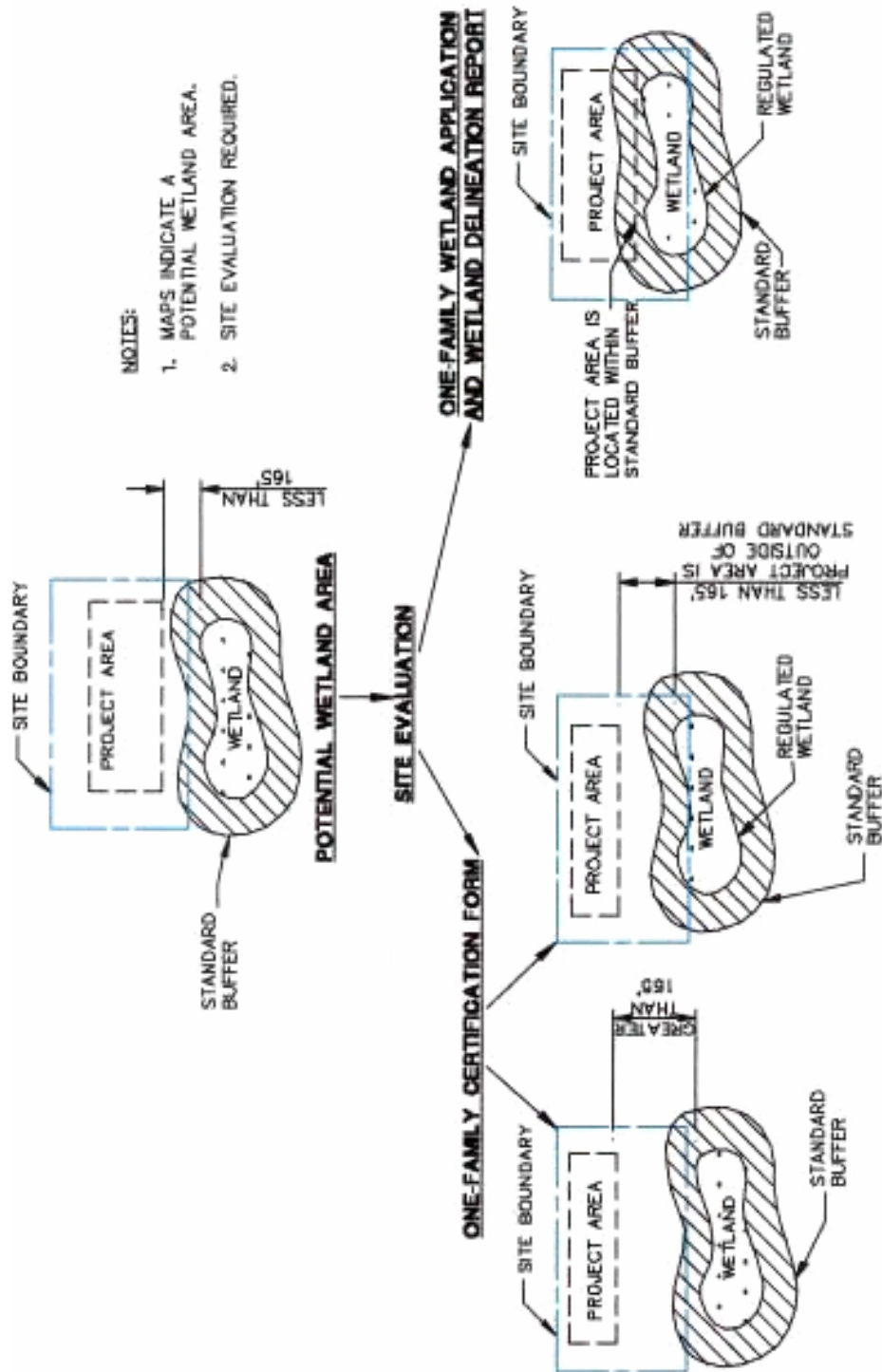
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Effective Date: May 2, 2005

FIGURE

18D.30-2



**City of Tenino**  
Community Development Department  
149 S. Hodgden  
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## SINGLE-FAMILY DWELLING WETLAND REVIEW

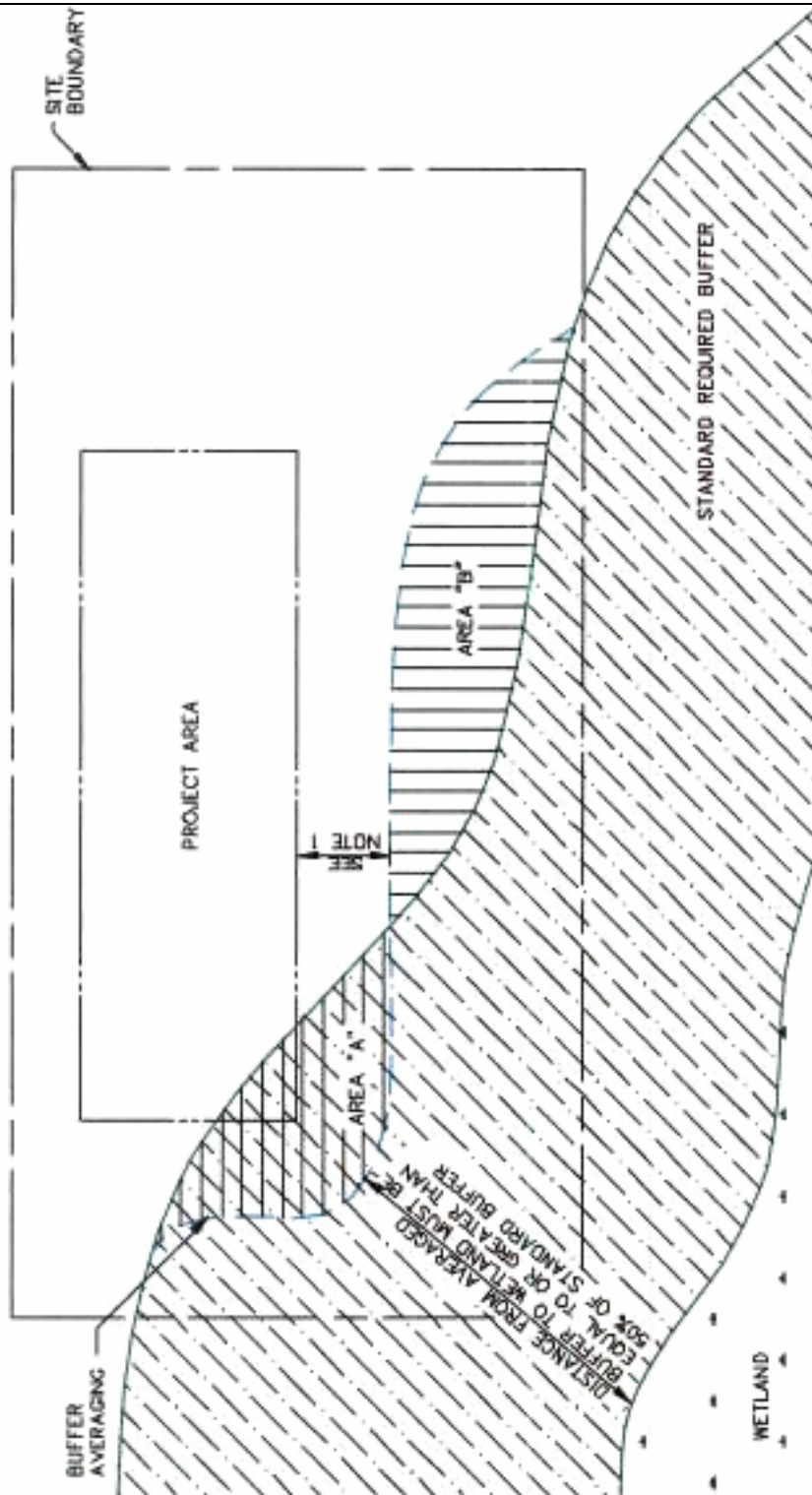
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Effective Date: May 2, 2005

FIGURE 18D.30-3





**NOTES:**

1. 15' MIN. REQUIRED SETBACK FROM AVERAGED BUFFER.
2. AREA "B" MUST BE EQUAL TO OR GREATER THAN AREA "A".

**WETLAND BUFFER AVERAGING**  
**MAY ONLY BE ALLOWED THROUGH CRITERIA IN 18E.30.D60.B.1**  
 N.T.S.



**City of Tenino**  
 Community Development Department  
 149 S. Hodgden  
 Tenino, WA 98589 (360) 264-2368

**WETLAND BUFFER AVERAGING**

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Effective Date: May 2, 2005

FIGURE

18D.30-4



## Chapter 18D.40

### CRITICAL FISH AND WILDLIFE HABITAT AREAS

#### Sections:

- [18D.40.010](#) Purpose.
- [18D.40.020](#) Critical Fish and Wildlife Species and Habitat Areas.
- [18D.40.030](#) Critical Fish and Wildlife Habitat Area Review Procedures.
- [18D.40.040](#) Critical Fish and Wildlife Habitat Area Standards.
- [18D.40.050](#) Mitigation Requirements.
- [18D.40.060](#) Buffer Requirements.
- [18D.40.070](#) Appendices.
  - A. Habitat Assessment Letters.
  - B. Habitat Assessment Studies.
  - C. Habitat Assessment Reports.
- [18D.40.080](#) Figures.
  - 18D.40-1 Examples of Potential Critical Fish and Wildlife Habitat Areas.
  - 18D.40-2 Critical Fish and Wildlife Habitat Area Review Procedures.
  - 18D.40-3 Riparian Buffer Extension Adjacent to Wetland.
  - 18D.40-4 Riparian Buffer Extension Landslide Hazard Buffer Area.

**18D.40.010 Purpose.** The focus of the Critical Fish and Wildlife Habitat Areas Chapter is directed to listed endangered, threatened, and sensitive species. Many land use activities can impact fish and wildlife habitat areas. Special care must be taken to manage lands that support critical fish and wildlife species to ensure development occurs in a manner that will not diminish the functions and values necessary to listed species and their habitat needs. The purpose of this Chapter is to identify critical fish and wildlife species and habitats and establish habitat protection procedures and mitigation measures designed to minimize any negative impacts associated with development or regulated activities.

#### **18D.40.020 Critical Fish and Wildlife Species and Habitat Areas.**

- A. **General.** Critical fish and wildlife habitat areas are directed to those areas that support in fact listed endangered, threatened and sensitive species, typically identified either by known point locations of specific species (such as a nest or den), by habitat areas, or both.
- B. **State and Federally Listed Species and their Associated Habitats.** Areas having a primary association with State - or Federally -listed endangered, threatened, or sensitive species of fish or wildlife (specified in [50 CFR 17.11](#), [50 CFR 17.12](#), [WAC 232-12-011](#), and [WAC 232-12-014](#)) and, which if altered, may reduce the likelihood that the species will survive and reproduce over the long term. The list of endangered, threatened, or sensitive species is maintained and located at <http://wdfw.wa.gov/wlm/diversty/soc/soc.htm>.
- C. **Habitat of Local Importance Nomination Process.**
  - 1. Nomination Process.
    - a. Any species or habitat not listed in TMC 18D.40.020 A and B above, may be nominated during the City annual comprehensive review program (see TMC Table 18A-1 Amendment Timelines and Tasks) and considered for listing as a species to be protected under the Critical Fish and Wildlife Habitat Areas protection program.

- b. Nominations shall be fish or wildlife species, or habitat areas to be protected within the natural geographic distribution of the City.
  - c. Nominations shall also include habitat features necessary to assure that a suitable habitat for a sustainable population currently exists and can be maintained in the urban area without creating an isolated subpopulation given current land uses and anticipated growth within the community.
  - d. Nominations shall provide and include the best available science references to be used by the City to identify the parameters of the species of local importance and the habitat necessary to continue the presence of a sustainable community within the City as the City grows and changes under the GMA.
  - e. Decisions shall become final subject to the following:
    - 1) An applicant or other party of record who may be aggrieved by the decision may appeal the decision within 14 days of the issuance of the decision by the City. If a written notice of appeal is received within the appeal period, the decision shall be referred to the City Council and shall not become final until the appeal process is complete and the City issues a final decision. Upon issuance of the final decision, the applicant may engage in activity based on the decision, provided applicable permits have been approved.
    - 2) If no appeal is submitted within the 14-calendar day appeal period, the preliminary approval shall become final on the first calendar day following the expiration of the appeal period. Upon the decision becoming final, the applicant may engage in activity based on the decision, provided applicable permits have been approved.
  - f. If an individual or agency desires to nominate a species not connected with that individual's property and a land use application has been submitted to the City at the location of the suspected species for nomination consideration location, the following remedies are available to contest the City's approval of the development application:
    - 1) Provide written comments during the application comment period stating:
      - a) The species for nomination consideration;
      - b) The possible impact the proposal may have upon the species;
      - c) The desire to have the species considered as a candidate;
      - d) Supporting evidence as provided in subparagraph d above;
    - 2) If the City has issued a decision for approval, the decision may be appealed using the appropriate appeal procedures pursuant to the applicable Process Type (Process Types I - V, TMC 18.40.080 through 18.40.120 respectively) by submitting the following:
      - a) A statement identifying the decision being appealed;
      - b) A statement of the alleged errors in the City's decision, including specific factual findings and conclusions disputed by the person filing the appeal;
      - c) Information requested in subparagraph 1) above;
      - d) The appellant's name, address, telephone number and fax number (if any), and any other information to facilitate communication with the appellant; and
      - e) Filing the appropriate appeal fee with the letter of appeal.
3. Review by Planning Commission.
- a. This program will be administered as a Process IV - Quasi-Judicial review process pursuant to Chapter 18.40.110 TMC.

- b. The Planning Commission shall prepare findings of fact that the species requested for listing:
  - 1) Presently exists in the community in a natural habitat;
  - 2) Is in a location in which the natural habitat may be maintained through listing and protected to retain such function through objective criteria within the community as it presently exists and as the community may change over time;
  - 3) The existing urban habitat is appropriate, used in fact, and likely to continue to be used if protected; and
  - 4) Habitat within the City is essential to the long-term survival of the species within the normal range or geographic setting.
  - 5) It is a species or habitat which the community finds has exceptional local concern and importance.
  - 6) The Planning Commission shall recommend listing to the City Council for the next comprehensive plan update and inclusion within Section 18D.40 TMC.
4. City Council Approval. The City Council shall act on Planning Commission recommendations and shall adopt such recommendations where:
  - a. The recommendation is consistent with the overall comprehensive plan; and
  - b. The recommendation is supported by best available science and adequate guidelines.

#### **18D.40.030 Critical Fish and Wildlife Habitat Area Review Procedures.**

##### **A. General Requirements.**

1. The City's Critical Fish and Wildlife Habitat Area maps provide an indication of where potential critical fish, wildlife habitat areas, and species of local importance are located within the City. The presence or location of a potential critical fish, wildlife species, habitat area, point location, or species of local importance that has not been mapped, but that may be present on or adjacent to a site, shall be determined using the procedures and criteria established in this Chapter.
2. The City will complete a review of the Critical Fish and Wildlife Habitat Area maps and other source documents for any proposed regulated activity to determine whether the site for the regulated activity is located within a potential critical fish or wildlife habitat. Identification of a potential critical fish or wildlife habitat area may also occur as a result of field investigation conducted by staff of the City or Washington Department of Fish and Wildlife (WDFW).
3. When the City's maps, sources, or field investigation indicates that the site for a proposed regulated activity is located within a potential critical fish or wildlife habitat area, the City shall require submittal of a critical fish and wildlife application and habitat assessment to determine the presence or absence of critical fish, wildlife species, habitat or species of local importance. The habitat assessment shall be documented as set forth in Subsection 18D.40.030 B, below (see [Figure 18D.40-2](#)).
4. The requirement to conduct a habitat assessment may be waived by the City when it determines that no listed critical fish and wildlife species or habitat areas as set forth in Section 18D.40.020, are present. The applicant shall be required to comply with the standards set forth in Section 18D.40.040 D.
5. Approval of a critical fish and wildlife application shall be granted upon a determination that the habitat assessment and mitigation plan, if applicable, are thorough and accurate and meet all requirements of this Title.

6. If application of the standards contained in this Chapter would deny all reasonable use of a site, the applicant may pursue a Reasonable Use Exception as set forth in Section 18D.20.050.
  7. Unless otherwise stated in this Chapter, the critical area protective measure provisions contained in Section 18D.10.080 shall apply.
- B. Habitat Assessment.** A habitat assessment is a site investigation process to evaluate the presence or absence of in fact listed critical fish, wildlife species or habitat areas affecting a subject property.
1. The applicant may select either a fish or wildlife biologist, as applicable, to conduct a habitat assessment to determine whether or not an in fact listed critical fish or wildlife habitat area, point location, and any associated buffers are located on the site for a proposed development as outlined below:
    - a. Applicants for single-family dwellings or agricultural activities may retain City staff to complete the habitat assessment as follows:
      - (1) Requests for City staff to conduct a habitat assessment shall be accompanied with a critical fish and wildlife habitat area application and associated fee(s).
      - (2) If City staff conducts the habitat assessment and determines that no critical fish or wildlife habitat areas, point locations, or associated buffers are present on the site, then the critical fish and wildlife habitat area review will be considered complete.
      - (3) If City staff conducts the habitat assessment and determines that critical fish or wildlife habitat areas, point locations, or associated buffers are present on the site, then the applicant shall be required to submit a habitat assessment study or a habitat assessment report as outlined in Subsection 18D.40.030 B(1)b. This requirement may be waived if the applicant agrees to comply with the standards set forth in Section 18D.40.040 and the critical area protective measures set forth in Section 18D.10.080.
    - b. If a fish or wildlife biologist conducts the habitat assessment, then the following documentation shall be submitted to the City:
      - (1) The habitat assessment shall be submitted in the form of a habitat assessment letter when the fish or wildlife biologist completes the field investigation and determines that a critical fish or wildlife habitat area, point location, or associated buffer is not located on the site. The habitat assessment letter shall meet the requirements contained in 18D.40.070 Appendix A (see [Figure 18D.40-2](#)).
      - (2) The habitat assessment shall be submitted in the form of a habitat assessment study when the fish or wildlife biologist completes the field investigation and determines a critical fish or wildlife habitat area, point location, or associated buffer is located on the site and when the proposed regulated activity complies with the standards set forth in Section 18D.40.040 and the buffer requirements as set forth in Section 18D.40.060. The habitat assessment study shall meet the requirements contained in 18D.40.070 Appendix B (see [Figure 18D.40-2](#)).
      - (3) The habitat assessment shall be submitted in the form of a habitat assessment report when the fish or wildlife biologist completes the field investigation and determines a critical fish or wildlife habitat area, point location, or associated buffer is located on the site and when the proposed development activity does not or cannot comply with the standards set forth in Section 18D.40.040 and the buffer requirements as set forth in Section 18D.40.060. The habitat

assessment report shall meet the requirements contained in 18D.40.070 Appendix C (see [Figure 18D.40-2](#)).

- (4) Habitat assessments shall be submitted to the City for review and approval together with a critical fish and wildlife habitat area application and associated fee(s).
  - (5) Habitat assessments shall be prepared, signed, and dated by a fisheries or wildlife biologist (as defined in Section 18D.10.060), as applicable to the particular species or habitat type.
  - (6) Habitat assessment reports shall address the mitigation requirements set forth in Section 18D.40.050.
2. All habitat assessments submitted under the requirements of this Chapter shall, at a minimum, include the following:
  - b. The parcel number of the subject property.
  - c. The site address of the subject property, if one has been assigned by the City.
  - d. The date and time when the site evaluation for the habitat assessment was conducted and the date when the habitat assessment was prepared.
  - e. The credentials of the fish or wildlife biologist who prepared the habitat assessment.
  - f. The mailing address and phone number of the property owner and the fish or wildlife biologist that prepared the habitat assessment.
  - g. A detailed description of the vegetation on and adjacent to the site.
  - h. Identification and a detailed description of any critical fish or wildlife species or habitats, as set forth in Section 18D.40.020, on or adjacent to the site and the distance of such habitats or species in relation to the site. Describe efforts to determine the status of any critical species in the project area, including information on survey methods, timing, and results of surveys for species or suitable habitat identification.
  - i. Include any information received from biologists with special expertise on the species or habitat type, such as WDFW, Tribal, USFS, or other local, regional, federal, and university fish, wildlife and habitat biologists and plant ecologists. Include any such conversations in the habitat assessment and cite as personal communication.
  - j. A map showing the location of the site, including written directions.
  - k. The City may also require that the applicant request a separate evaluation of the site by WDFW staff to confirm the findings of the habitat assessment.
3. Hold harmless clauses, disclaimers, and limitations are not allowed within a habitat assessment letter.
4. The City shall review the habitat assessment and either:
  - a. Accept the habitat assessment and approve the critical fish and wildlife application; or
  - b. Reject the habitat assessment and notify the applicant in writing of the reasons why the habitat assessment was rejected.

#### **18D.40.040 Critical Fish and Wildlife Habitat Area Standards.**

##### **A. General.**

1. Activities permitted under this section shall comply with the provisions of all other Chapters contained in this Title.
2. All proposed regulated activities shall comply with the buffer requirements contained in Section 18D.40.060.

3. If the City determines that mitigation is necessary to offset the identified impacts from a proposed development, the applicant shall comply with the mitigation requirements set forth in Section 18D.40.050.
  4. Unless otherwise allowed in this Chapter, all regulated activities shall be located outside critical fish and wildlife habitat areas and associated buffers.
  5. A proposed regulated activity may be allowed within a critical fish or wildlife habitat area or required buffer when located on an existing lot of record that was created prior to the effective date of this ordinance subject to the following conditions:
    - a. Applicants shall demonstrate there are no other feasible alternatives that would allow the proposed development to occur completely outside the critical fish or wildlife habitat area or the required associated buffer.
    - b. The development cannot be located outside the critical fish or wildlife habitat area or required buffer due to topographic constraints of the parcel or size and/or location of the parcel in relation to the limits of the critical fish or wildlife habitat area or required buffer.
    - c. If applicable, a building setback variance has been reviewed, analyzed, and rejected as a feasible alternative to encroachment into the critical fish or wildlife habitat area or associated buffer.
    - d. The proposed project complies with the standards set forth in this Section and has demonstrated through the submittal of a habitat assessment report that adequate mitigation as outlined in Section 18D.40.050 has been provided.
- B. Riparian Areas, Ponds, and Associated Buffers.** The following specific regulated activities may occur within a riparian area, pond, or associated buffer subject to the following standards:
1. **Clearing and Grading.** When clearing and grading is permitted as part of an authorized regulated activity or as otherwise allowed in these standards, the following shall apply:
    - a. Grading is allowed only during the dry season, which is typically regarded as beginning on May 1st and ending on October 1st of each year, the City may extend or shorten the dry season on a case-by-case basis, determined on actual weather conditions.
    - b. Filling or modification of a wetland or wetland buffer is permitted only if it is conducted as part of an approved wetland permit issued by the City.
    - c. The soil duff layer shall remain undisturbed to the maximum extent possible. Where feasible, any soil disturbed shall be redistributed to other areas of the project site.
    - d. The moisture-holding capacity of the topsoil layer shall be maintained by minimizing soil compaction or reestablishing natural soil structure and infiltrative capacity on all areas of the site that impervious surfaces do not cover.
    - e. Erosion and sediment control shall be provided that meets or exceeds the standards set forth in the Tenino Stormwater Management Manual.
  2. **Vegetation Removal, Disturbance, and Introduction.** Limited vegetation removal within the protection area shall be allowed subject to the following standards:
    - a. Hazard trees may be cut provided that:
      - (1) The applicant submits a report from a certified arborist, licensed architect, or professional forester that documents the hazard and provides a replanting schedule for replacement trees and receives written approval from the City authorizing the tree removal;

- (2) Tree cutting shall be limited to limbing and crown thinning, unless otherwise justified by the landowner's expert. Where limbing or crown thinning is not sufficient to address the hazard, trees should be topped to remove the hazard rather than cut at or near the base of the tree. All vegetation cuttings (tree stems, branches, tops, etc.) shall be left within the critical area or buffer unless removal is warranted due to the potential for disease transmittal to other healthy vegetation;
  - (3) The landowner shall replace any trees that are felled with new trees at a ratio of two replacement trees for each tree felled with species that are native and indigenous to the site;
  - (4) Hazard trees determined to pose an imminent threat or danger to public health or safety, or to public or private property, or serious environmental degradation may be removed or topped by a landowner prior to receiving written approval from the City, provided that within 14 days following such action, the landowner shall submit the necessary report and replanting schedule demonstrating compliance with 18D.40.040 B2a(1) through (3) above.
- b. Trimming of vegetation for purposes of providing view corridors will be allowed provided that trimming shall be limited to view corridors of 20 feet in width or less, that no more than 30% of the live crown is removed, and that benefits to fish and wildlife habitat are not reduced. Trimming shall be limited to hand pruning of branches and vegetation. Trimming shall not include felling, topping, or removal of trees.
- c. Limited vegetation and tree removal subject to the conditions contained in an approval for a regulated activity.
- d. Introduced vegetation shall be limited to species that are native and historically indigenous to the site.
- 3. **Fencing.** Fencing shall be placed in such a manner as to maintain wildlife movement corridors and not create any fish passage blockages. The City shall approve the location, type, and height of any proposed fencing.
- 4. **Shoreline Erosion Control Measures.** New or replacement shoreline erosion control measures shall be subject to the following standards:
  - a. The proposal complies with the Grade and Fill provisions set forth in Title 15 - Building and Construction.
  - b. The applicant has submitted a habitat assessment report as set forth in Section 18D.40.030.
  - c. The habitat assessment report demonstrates the following:
    - (1) Natural shoreline processes will be maintained. The project will not result in increased shore erosion or alterations to, or loss of, shoreline substrate within 1/4 mile (measured along the shoreline) of the site.
    - (2) The shoreline erosion control measure will not adversely impact critical fish or wildlife habitat areas or associated wetlands.
    - (3) Adequate mitigation measures, as set forth in Section 18D.40.050, are provided that ensure no net loss of riparian habitat or function occurs as a result of the proposed shoreline erosion control measure.
- 5. **Streambank Stabilization.** Streambank stabilization to protect new structures from future channel migration is not permitted except when such stabilization is achieved through bioengineering or soft armoring techniques. Streambank stabilization shall comply with the provisions set forth in Chapter 18D.70.

6. **Roads, Trails, Bridges, and Rights-of-Way.** Construction of trails, roadways, and minor road bridging (less than or equal to 30 feet wide) may be allowed subject to the following standards:
  - a. There is no other feasible alternative route with less impact on the environment.
  - b. The crossing allows for uninterrupted downstream movement of wood and gravel.
  - c. Mitigation, pursuant to Section 18D.40.050, for impacts is provided.
  - d. Road bridges are designed according to the WDFW Habitat and Lands Environmental Division's Fish Passage Design at Road Culverts, March, 1999 and the NMFS Guidelines for Salmonid Passage at Stream Crossings, 2000.
  - e. Trails and associated viewing platforms shall be made of pervious materials.
7. **Utility Facilities.**
  - a. Installation of a utility is permitted if constructed in an existing, improved roadway, driveable surface or shoulder, subject to compliance with Thurston County road maintenance Best Management Practices (BMPs).
  - b. New utility lines and facilities are permitted to cross watercourses if they comply with the following standards:
    - (1) Avoid critical fish and wildlife habitat areas to the maximum extent possible.
    - (2) Cross at an angle greater than sixty degrees to the centerline of the channel in streams or perpendicular to the channel centerline whenever boring under the channel is not feasible.
    - (3) Crossings are contained within the footprint of an existing road or utility crossing where possible.
    - (4) Avoid paralleling the stream or following a down-valley course near the channel.
    - (5) Do not increase or decrease the natural rate of shore migration or channel migration.
    - (6) Bore beneath the scour depth and hyporheic zone of the water body and Channel Migration Zone (CMZ) where feasible.
8. **Public Flood Protection Measures.** New public flood protection measures and expansion of existing ones may be approved, subject to City review and approval of a habitat assessment report or the approval of a Federal Biological Assessment.
9. **Instream Structures.** A new instream structure (e.g., such as, but not limited to, high flow bypass, sediment ponds, instream ponds, retention and detention facilities, dams, weirs, etc.) shall be allowed only as part of an approved mitigation or restoration project or watershed basin plan approved by the City and upon acquisition of any required State or Federal permits. The structure shall be designed to avoid modifying flows and water quality in ways that may adversely affect critical fish species. Proposals for placement of water quality, water quantity, or other instruments or structures within a stream to gather data, or as a mitigation measure, shall be exempt from the provisions of this Title upon review and approval by the City.
10. **Stormwater Conveyance Facilities.** Conveyance structures whose sole purpose is to convey stormwater already treated for quality, or water bypassed around water quality treatment facilities pursuant to an approved stormwater plan, may be constructed subject to the following standards:
  - a. No other feasible alternatives with less impact exist;
  - b. Mitigation for impacts is provided;
  - c. Stormwater conveyance facilities shall incorporate fish habitat features;



- d. Vegetation shall be maintained and, if necessary, added adjacent to all open channels and ponds in order to retard erosion, filter sediments and shade the water.
11. **On-site Sewage Systems and Wells.**
- a. New on-site sewage systems and individual wells are permitted if accessory to an approved structure.
  - b. Repairs to failing on-site sewage systems associated with an existing structure shall be accomplished by utilizing one of the following methods that result in the least impact:
    - (1) Connection to an available public sewer system;
    - (2) Replacement with a new on-site sewage system located in a portion of the site that has already been disturbed by development and is located landward as far as possible, provided the proposed sewage system is in compliance with the provisions in Chapter 18D.70; or
    - (3) Repair to the existing on-site septic system.
12. **New Agricultural Activities.** New agricultural activities are permitted subject to the following:
- a. Agricultural activities and structures shall comply with the provisions of Chapter 18D.070 Flood Hazard Areas.
  - b. The agricultural activity is in compliance with the USDA, NRCS Conservation Reserve Program farm management standards.
  - c. A copy of an approved NRCS or Thurston County Conservation District farm management plan that documents compliance with the USDA, NRCS Conservation Reserve Program farm management standards has been submitted to the City for review and approval.
13. **Structures and Landscaped Areas.** New construction, redevelopment, or additions or expansions of existing structures or reconstruction of damaged structures may be permitted subject to the following:
- a. Maximum disturbance (including the principal structure, accessory structures, and related appurtenances such as landscaped areas, wells, onsite septic systems, etc.) within the habitat area and/or associated buffer shall be:
    - (1) 2,500 square feet if the area of the lot within the buffer is 5,000 square feet or less;
    - (2) 5,000 square feet if the area of the lot within the buffer is 10,000 square feet or greater;
    - (3) 50 percent of the area of the lot if the area within the buffer is between 5,001 and 9,999 square feet; and
    - (4) Expansions and redevelopment projects shall be limited to the lesser of 1,000 additional square feet of disturbance area or the same area and disturbance criteria that would have been permitted if the site were undeveloped.
  - b. Development is prohibited within 50 feet of any waterbody, watercourse, as measured landward from the ordinary high water mark.
  - c. Development is prohibited within any side channel, oxbow, spring, or other type of off-channel habitat including connectable relic channels or oxbows.
  - d. The area not disturbed by development shall be managed for native or approved vegetation and planted with native or approved vegetation where necessary following adopted guidelines to reestablish natural forested conditions (example: WDFW's [Stream Habitat Restoration Guidelines](#)).
  - e. The proposal complies with the standards set forth in Chapter 18D.70, Flood

Hazard Areas.

- f. The expansion of existing multi-family structures and the conversion of lots from single-family to multi-family use is prohibited.

14. **Alteration of Watercourses.** Alteration of watercourses shall comply with the standards set forth in Section 18D.70.040 D.

- C. **Standards for Other Critical Habitat Areas.** Standards for critical habitat areas approved under the nomination process not listed in Subsections 18D.40.030A and B above shall be determined on a case by case basis, based upon the development and the needs of specific species or habitat area. The City may coordinate with the WDFW in these instances to determine appropriate standards to assist the applicant in preparation of an appropriate habitat management plan.

**18D.40.050 Mitigation Requirements.**

- A. All regulated development activities in critical fish and/or wildlife habitat areas and associated buffer areas shall be mitigated in the sequence pursuant to 18D.30.050A Mitigation.
- B. Specific mitigation elements are to be discussed within a habitat assessment report, as defined in 18D.40.070 Appendix C. The habitat assessment report is to provide specific recommendations to reduce, eliminate, or mitigate for the adverse effects of the proposed activity. Potential measures include timing restrictions for all or some of the activities; clearing limitations; avoidance of specific areas; special construction techniques; Hydraulic Project Approval (HPA) conditions; planting with native vegetation; habitat enhancement (i.e., fish passage barrier removal); best management practices; etc. If applicable, append a copy of the HPA, specifications for [BMPs](#), or other documentation to support the implementation of the conservation measure.
- C. The City may require an enhancement plan that provides mitigation for the impacts associated with any encroachment into the habitat area or associated buffer or a request for buffer averaging/reduction as set forth in Section 18D.40.060 C. The enhancement plan shall use native plant species that are indigenous to the project area and shall substantiate that an enhanced habitat area and/or buffer will improve the functional attributes of the affected area to provide additional protection for critical fish or wildlife habitat, wetlands, landslide hazard areas, or adjacent properties that may be affected by the proposal. At a minimum, the enhancement plan shall include detailed information on the following:
  - 1. Type of species proposed.
  - 2. Exact location of proposed enhancement area.
  - 3. Timing and schedule of planting.
  - 4. Schedule for monitoring and maintenance and any financial guarantees for these as required in Section 18D.10.080.
  - 5. Name, address, and telephone number of the person(s) responsible for the enhancement project.
  - 6. Any additional information required by the City.
- D. Mitigation of alterations to habitat areas shall achieve equivalent or greater biological functions and shall include mitigation for adverse impacts upstream and downstream of the development proposal site. Mitigation shall address each function affected by the alteration to achieve functional equivalency or improvement on a per function basis.
- E. In cases in which it is determined that aquatic habitat mitigation is appropriate, the following shall apply:

1. Mitigation may be provided off-site when the applicant demonstrates that on-site mitigation is not scientifically feasible or practical due to physical features of the site or where it can be demonstrated that greater functional and habitat values can be achieved through offsite mitigation; and
2. Within in the immediate vicinity.

#### **18D.40.060 Buffer Requirements.**

- A. **Buffer Delineation.** Buffers shall be required as set forth for each habitat type. The required buffers shall be delineated, both on a site plan or plat, and on the property prior to approval of any regulated activity.
- B. **Buffer Widths.**
  1. **Riparian Areas and Ponds.**
    - a. Riparian areas (streams and creeks), and ponds shall be managed through the use of buffers. Buffers shall be based upon the water type classification of the water body as established by the Department of Natural Resources Stream Typing Classification System. Refer to Table 18D.40-1 for the water types and the associated buffer requirements.
    - b. The required riparian buffer width is measured from the edge of the ordinary high water mark.
    - c. The required pond buffer width is measured from the edge of the ordinary high water mark (OHWM).
    - d. The required buffer shall be extended to include any adjacent regulated wetland(s), landslide hazard areas and/or erosion hazard areas and required buffers (see Figures [18D.40-3](#) and [18D.40-4](#)).
    - e. Buffers are an area of native or undisturbed vegetation and if the buffer crosses the built environment, that area shall be a Management Zone.
  2. **Buffers for Other Critical Habitat Areas.** Appropriate buffers for critical habitat areas not listed in Table 18D.40-1 shall be determined on a case by case basis, based upon the needs of specific species or habitat area of study. The City will coordinate with the WDFW in these instances to determine an appropriate buffer width.

**TABLE 18D.40-1 Buffer Requirements**

<b>Water Type<sup>1</sup></b>	<b>Water Body Criteria</b>	<b>Buffer Width<sup>2</sup></b>
Type S (1)	All waters, within their ordinary high-water mark, as inventoried as "shorelines of the state" under chapter <a href="#">90.58</a> RCW and the rules promulgated pursuant to chapter <a href="#">90.58</a> RCW, but not including those waters' associated wetlands as defined in chapter <a href="#">90.58</a> RCW.	150 feet landward from the OHWM, unless a shoreline of the state.
Type F (2 & 3)	Segments of natural waters not classified as Type 1 Water and have a high fish, wildlife, or human use. These are segments of natural waters and periodically inundated areas of their associated wetlands. Type 3 are segments of natural waters which are not classified as Type 1 or 2 Waters and have a moderate to slight fish, wildlife, and human use.	100 feet landward from the OHWM.
Type Np (4)	All segments of natural waters within the bankfull width of defined channels that are perennial nonfish habitat streams. Perennial streams are waters that do not go dry any time of a year of normal rainfall.	50 feet landward from the OHWM.
Type Ns (5)	All segments of natural waters within the bankfull width of the defined channels that are not Type 1, 2, 3, or 4 Waters. These are seasonal, nonfish habitat streams in which surface flow is not present for at least some portion of the year and are not located downstream from any stream reach that is a Type 4 Water.	35 feet landward from the OHWM.

<sup>1</sup> Number by alpha type is the Interim Water type number established by WAC 222-16-031 Interim water typing system

- <sup>2</sup> There may be regulated wetlands associated with ponds or lakes which may require a buffer greater than those listed in Table 18D.40-1 (e.g., a lake with a 35-foot buffer requirement may have associated wetlands with 25-300 foot buffers, or a 200-foot management zone may for permitting requirements if a shoreline of the State).
- <sup>3</sup> Fish species are those identified in Section 18D.40.020.

**C. Modification to Buffer Width Requirements.** The standard buffer widths of Subsection 18D.40.060 B may be modified by averaging, reducing, or increasing as follows:

1. **Buffer Averaging.** Buffer width averaging may be proposed through submittal of a habitat assessment report. Buffer width averaging shall be allowed only when the applicant demonstrates all of the following:
  - a. Buffer encroachment is unavoidable.
  - b. The habitat area contains variations in sensitivity (both geological and biological) due to existing site characteristics.
  - c. Buffer averaging will not adversely impact the structure and function of the habitat area.
  - d. The buffer averaging is not inconsistent with other buffer requirements set forth under this Title (e.g., wetlands, landslide hazard areas, etc.).
  - e. The buffer averaging will not increase the risk of slope failure or downslope stormwater drainage impacts.
  - f. The total buffer area after averaging is no less than the buffer area prior to the averaging.
  - g. The minimum buffer width after averaging will not be less than 50% of the widths established in Subsection 18D.40.060 B.
  - h. The averaging is accomplished within the project boundaries.
2. **Buffer Width Reductions.** A buffer width reduction may be proposed through submittal of a habitat assessment report. Buffer reductions of up to a maximum of 25% may be allowed when the applicant demonstrates the following circumstances:
  - a. Buffer encroachment is unavoidable.
  - b. The buffer reduction will not result in an adverse impact to the species of study, any associated wetlands, or landslide hazard areas.
  - c. The buffer reduction will not increase the risk of slope failure or downslope stormwater drainage impacts.
  - d. The encroachment does not occur within landslide hazard area buffer or into the buffer of any associated wetlands.
  - e. The proposed buffer area is extensively vegetated, has less than 20% slopes, and the reduction will not result in adverse impact to the structure and function of the habitat area.
  - f. The acreage included in the buffer would substantially exceed the size of the habitat area.
  - g. The minimum buffer width will not be less than 75% of the total required width.
3. **Buffer Width Increases.** The City may require an increased buffer width when a larger buffer is necessary, based on site conditions, to protect habitat area functions and values. This determination shall be reasonably related to protection of the functions and values of the regulated habitat area. Such determination shall demonstrate any of the following:
  - a. A larger buffer is necessary to maintain viable populations of existing species or protect the existing functions of the habitat area;
  - b. The adjacent land is susceptible to severe erosion and erosion control measures will not effectively prevent adverse habitat impacts; or

- c. The adjacent land has minimal vegetative cover or slopes greater than 20%.
- d. The habitat area is in an area of high tree blow down potential. In these cases the habitat area may be expanded an additional 50 feet on the windward side.
- 4. Where an application for a development permit, other than a site development permit, has not been submitted in association with a proposed forest practice activity, a deviation from the standard buffer, as set forth in 18D.40.060 C1 and 2, shall not be allowed.

**18D.40.070 Appendices.**

- A. [Habitat Assessment Letters.](#)
- B. [Habitat Assessment Studies.](#)
- C. [Habitat Assessment Reports.](#)

**18D.40.080 Figures.**

- 18D.40-1 [Examples of Potential Critical Fish and Wildlife Habitat Areas.](#)
- 18D.40-2 [Critical Fish and Wildlife Habitat Area Review Procedures.](#)
- 18D.40-3 [Riparian Buffer Extension Adjacent to Wetland.](#)
- 18D.40-4 [Riparian Buffer Extension Landslide Hazard Buffer Area.](#)

**18D.40.070 Appendices.**

**APPENDIX A**

**HABITAT ASSESSMENT LETTERS**

- A. The habitat assessment letter shall, at a minimum, include the following:
  - 1. The information required in Section 18D.40.030 B2.
  - 2. Documentation that the potential habitat is not present. Discuss the habitat features or types that are available as compared to the habitat features that define the potential habitat. Describe why potential restoration measures would not be feasible.
  - 3. Documentation that potential species are not present. Note: a determination that a species is lacking based upon limited field investigation occurring at an inappropriate time of the year for the species of study is not acceptable. In such cases, the City will require separate confirmation of absence provided by the Washington Department of Fish and Wildlife.
- B. Hold harmless clauses, disclaimers, and limitations are not allowed within a habitat assessment letter.

## **18D.40.070 Appendices.**

### **APPENDIX B**

#### **HABITAT ASSESSMENT STUDIES**

- A. The habitat assessment study shall, at a minimum, include the following:
1. The information required in Section 18D.40.030 B2.
  2. Identify the presence of the habitat area or species on the site.
  3. Identify and discuss how the project complies with the standards set forth in Section 18D.40.040.
  4. Provide a detailed description of the proposed project. At a minimum, the following items should be included:
    - a. A legal description (Section, Township, Range) and vicinity map that clearly show the site and project area in relation to nearby waterbodies, sensitive habitats, etc.
    - b. A site plan of the habitat area and associated buffer in relation to the proposed project area.
    - c. Photographs, especially color copies, are useful to orient the reviewer to the project area. A combination of aerial or orthophotos and snapshots are ideal.
  5. Describe the environmental baseline (current or pre-project) condition of the habitat and the project area. The baseline description should address all pertinent habitat parameters for the species.
  6. Describe in detail the type and scope of development activity proposed:
    - a. Describe the overall purpose of the project and a brief summary of project objectives.
    - b. List all proposed project related construction activities and types of equipment. Provide a chronology of activities, timing of construction, hours of operation, phasing.
    - c. Provide to-scale plans that show where work is proposed relative to habitat areas and buffers.
    - d. Quantify areas of vegetation removal, include clearing and grubbing, vegetation type.
    - e. Describe proposed grading and filling or other earthwork, include specific BMPs for erosion, sedimentation, stormwater, and spill control. If appropriate, append the Temporary Erosion Sediment Control ([TESC](#)) Plan, Spill Control Plan, BMP specifications, etc.
    - f. Provide stormwater treatment information including:
      - (1) Amount of new impervious surface;
      - (2) Percent of surface and type of treatment for new and existing impervious surface;
      - (3) Specify BMPs to treat for quality and quantity; and
      - (4) Identify the receiving area /waterbody for each BMP, including overflow channels.
- B. Hold harmless clauses, disclaimers, and limitations are not allowed within a habitat assessment study.

## APPENDIX C

### HABITAT ASSESSMENT REPORTS

- A. The applicant is advised to refer to the following guidance documents during the course of preparing any habitat assessment report (HAR):
1. Washington Department of Fish and Wildlife [Priority Habitat and Species Management Recommendations, May 1991](#) (or as hereafter amended), and supplemental documents including but not limited to:
    - b. Priority Habitats and Species List;
    - c. Management Recommendations for Washington's Priority Habitats: Oregon White Oak Woodlands;
    - d. Management Recommendations for Washington's Priority Habitats: [Volume I Invertebrates](#); and
    - e. Management Recommendations for Washington's Priority Habitats: [Volume III Amphibians and Reptiles](#).
    - f. Management Recommendations for Washington's Priority Habitats: [Volume IV Birds](#).
    - g. Management Recommendations for Washington's Priority Habitats: [Volume V Mammals](#).
    - h. Management Recommendations for Washington's Priority Habitats: [Riparian](#).
  2. [Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale](#) (NMFS 1996).
  3. [A Guide to Biological Assessments](#) (NMFS revised February 2004).
  4. [NMFS Checklist](#) for Documenting Environmental Baseline and Effects of Proposed Action(s) on Relevant Indicators.
- B. The following information must be included in every habitat assessment report:
1. **Project Description.** Describe in detail the type and scope of action proposed.
    - a. Describe the overall purpose of the project and a brief summary of project objectives.
    - b. List all proposed project related construction activities and types of equipment.
    - c. Provide to-scale plans that show where work is proposed relative to sensitive areas and/or habitat.
    - d. Quantify areas of vegetation removal, include clearing and grubbing, vegetation type, replanting plans.
    - e. Provide a chronology of activities, timing of construction, phasing.
    - f. Describe proposed grading and filling or other earthwork, include specific BMPs for erosion, sedimentation, stormwater, and spill control. If appropriate, append the Spill Control Plan, BMP specifications, etc.
    - g. Provide stormwater treatment information including:
      - (1) Amount of new impervious surface;
      - (2) Percent of surface and type of treatment for new and existing impervious surface;
      - (3) Specify BMPs to treat for quality and quantity;
      - (4) Identify the receiving area /waterbody for each BMP, including overflow channels.

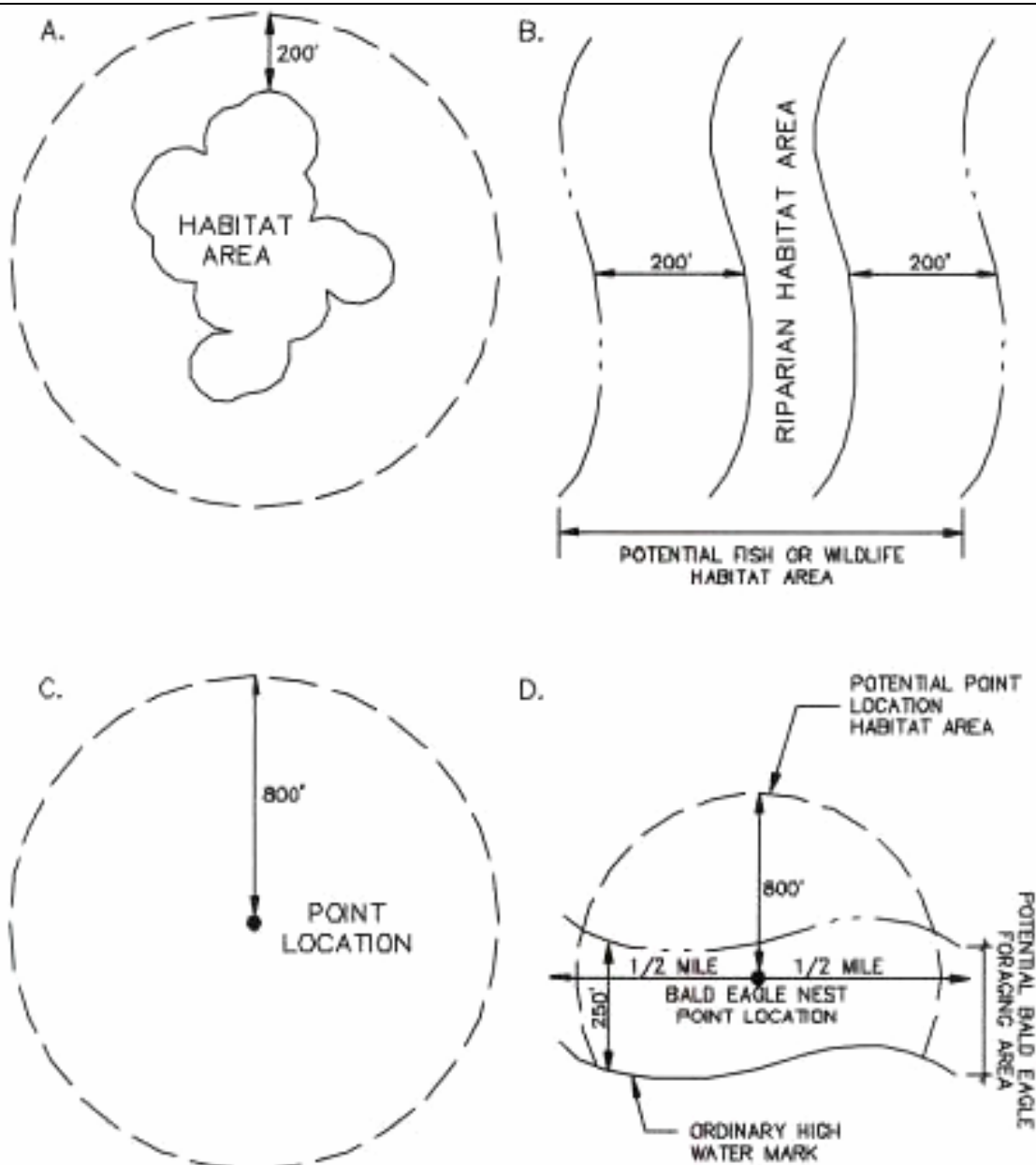


- h. Describe proposed in-water work (below OHWM or extreme high tide) and work over waterbodies, and potential for impacts to riparian or aquatic vegetation. Include conditions and work windows as described in the WDFW HPA. State clearly if the project does not include any in-water or over water work.
2. **Description of the Project Area.** The following items should be addressed as appropriate:
  - a. Provide a legal description (Section, Township, Range) and vicinity map that clearly shows the project in relation to nearby waterbodies, sensitive habitats, etc.
  - b. Date of field review(s) of project, credentials of personnel involved, and results of visit(s).
  - c. Describe the environmental baseline (current or pre-project) condition of the habitat and the project area. The baseline description should address all pertinent habitat parameters for the species.
  - d. Describe the project setting in terms of physiographic region, general topography, dominant habitat and vegetation type(s), aquatic resources, land use patterns, and existing disturbance levels from human activities, roadways, etc.
  - e. Include information about past and present activities in the area that relate to the species or its habitat and/or the proposed action. This could include information on adjacent development projects, past consultations with State or Federal agencies, previously established conservation measures, or species management plans.
3. **Critical Fish and Wildlife Species and Habitat Occurrence.** The HAR must be based on current site-specific information about the species and its life history. Cite any relevant scientific literature or research findings. At a minimum, the following items should be addressed:
  - a. Cite species listings provided by NMFS, WDFW, and/or USFWS. Append a copy of the listing to the report. Species listings should be updated every six months.
    - (1) Identify any State listed, Federal or State proposed species (and candidate or species of concern if appropriate), and designated or proposed critical habitat that are known or have the potential to occur on site or in the vicinity of the project area.
    - (2) Identify fish by Ecologically Significant Unit (ESU).
  - b. Describe the species, its habitat requirements and ecology in general, and relate that to the local populations. A lengthy life history is not required, but enough information should be provided to adequately explain the potential impacts.
  - c. Describe the potential suitable habitat for the species found on site or in the project vicinity and how local populations use it. Discuss the local status of the species as appropriate. Determine the likely level and type of use of the area by each species.
4. **Analysis of Effects on Listed and Proposed Species and Designated and Proposed Critical Habitat.** The HAR should provide a thorough analysis of, and a separate section addressing the potential direct, indirect, interrelated and interdependent, and cumulative effects of the action on the species and its habitat within the project area. The following items should be addressed:
  - a. Define the project area (area of potential impacts, both indirect and direct). The area of impact is usually larger than the project area or project vicinity (i.e., the river upstream and downstream from a bridge project, waterbodies receiving stormwater).
  - b. Describe how the environmental baseline (current or pre-project condition of the habitat in the project area) will be degraded, maintained or improved (restored). If

appropriate, append the completed NMFS Checklist for Documenting Environmental Baseline and Effects of Proposed Action(s) on Relevant Indicators.

- c. Direct Effects: Describe and analyze the effects of the action that would directly affect the species. Include actions that would potentially remove or destroy habitat, displace or otherwise influence the species, either positively (beneficial effects) or negatively (adverse effects).
  - d. Describe potential for impacts from disturbance (i.e., noise above ambient levels, sudden loud noises, increased human activity), from construction and continuing operation. Construction impacts would be considered a direct effect whereas operation noise impacts could be considered indirect effects as they occur later in time.
  - e. Indirect Effects: Describe any potential indirect impacts (those that occur later in time) such as impacts to future food resources or foraging areas, and impacts from increased long-term human access.
  - f. Interrelated/Interdependent Effects: Describe and analyze any potential effects from interdependent actions (actions that have no independent utility apart from the primary action) and interrelated actions (actions associated with the primary action and dependent upon that action for their justification) on the species or habitat that would not occur if not for the proposed action. Examples of these two effects include site clearing activities associated with new home construction (an interdependent effect), and increases in light, noise, and glare that occur as a result of land division (an inter-related effect).
  - g. Cumulative Effects: Identify to the extent possible those cumulative effects within the project area that are reasonably certain to occur.
  - h. If species-specific recovery plans or management plans have been established by the U.S. Fish and Wildlife Service, WDFW, or National Marine Fisheries Service, address the project in terms of compliance and recommendations.
  - i. For proposed species, analyze the potential for the project to jeopardize the continued existence of the species.
  - j. The HAR must contain a distinct statement of the overall effect of the project on each species. It must also provide supporting evidence to justify the effect determination (for listed species) or jeopardy call (for proposed species). The determination must be consistent throughout and worded correctly. See NMFS or USFWS Guidance for specific wording for each status.
5. **Recommended Conservation Measures.** The HAR should describe components of the project that may benefit or promote the recovery of listed species and are included as an integral part of the proposed project. These conservation (or mitigation) measures serve to minimize or compensate for project effects on the species under review. The following items should be addressed:
- a. Provide specific recommendations, as appropriate, to reduce or eliminate the adverse effects of the proposed activity. Potential measures include: timing restrictions for all or some of the activities; clearing limitations; avoidance of specific areas; special construction techniques; HPA conditions; replanting with native vegetation; potential of habitat enhancement (i.e., fish passage barrier removal); best management practices, etc.
  - b. If applicable, append a copy of the HPA, specifications for BMPs, or other documentation to support the implementation of the conservation measure.

- c. Include a description of proposed monitoring of the species, its habitat, and mitigation effectiveness.
- 6. **Conclusions and Effect Determinations.**
  - a. Summarize the proposed project and objectives, and restate the listed species that may occur near the project and the expected level of use.
  - b. State what conclusions regarding potential impacts to the species discussed can be supported from the information presented in the report. The following items should be addressed:
    - (1) A determination of effect must be made for each identified critical fish and wildlife species or habitat area. For each, only one of the following determinations of effect is acceptable:
      - (a) No Effect: The appropriate finding to make when the direct or indirect impacts of a project will have no affect of any kind, negative or beneficial, upon a species or habitat area;
      - (b) May Affect, Not Likely to Adversely Affect: The appropriate finding to make when the direct or indirect effects of a project are insignificant, discountable, or beneficial; or
      - (c) Likely to Adversely Affect: The appropriate finding to make when the direct or indirect effects of a project may adversely impact a species or habitat area and the effects are not insignificant.
    - (2) Determinations of “no effect” or “may affect, not likely to adversely affect” may not be based upon the argument that species will be displaced to other suitable habitat or that (based upon a limited number of surveys) species are not known to occur. The failure to provide site-specific surveys at the appropriate time of the year for the species of study will result in the City assuming a worst-case scenario in regards to project-related impacts.
  - c. For any proposed species or proposed critical habitat discussed, the conclusions should indicate whether the proposed project is likely to jeopardize the continued existence of the species (as in the entire species, not individual(s)), or adversely modify the proposed critical habitat.
- 7. **References and Appendices.** Refer to all appropriate project documents, particularly if the assessment depends upon information located elsewhere (e.g., in an EIS). Applicants may consider providing the City with copies of pertinent documents along with the HAR. At a minimum, the following items should be addressed:
  - a. Provide citations for other information referred to in the HAR, such as current literature and personal contacts used in the assessment. Include name, affiliation, and date.
  - b. Include as appropriate any photographs, survey methods, protocols, and results. Do not provide specific information regarding the exact location of State- or Federally-listed species within the HAR document. Federal and State restrictions exist regarding the release of such information.
- C. Hold harmless clauses, disclaimers, and limitations are not allowed within a habitat assessment report.



**EXAMPLES OF POTENTIAL CRITICAL  
FISH AND WILDLIFE HABITAT AREAS**

N.T.S.



**City of Tenino**  
Community Development Department  
149 S. Hodgden  
Tenino, WA 98589 (360) 264-2368

**EXAMPLES OF POTENTIAL CRITICAL FISH AND  
WILDLIFE HABITAT AREAS**

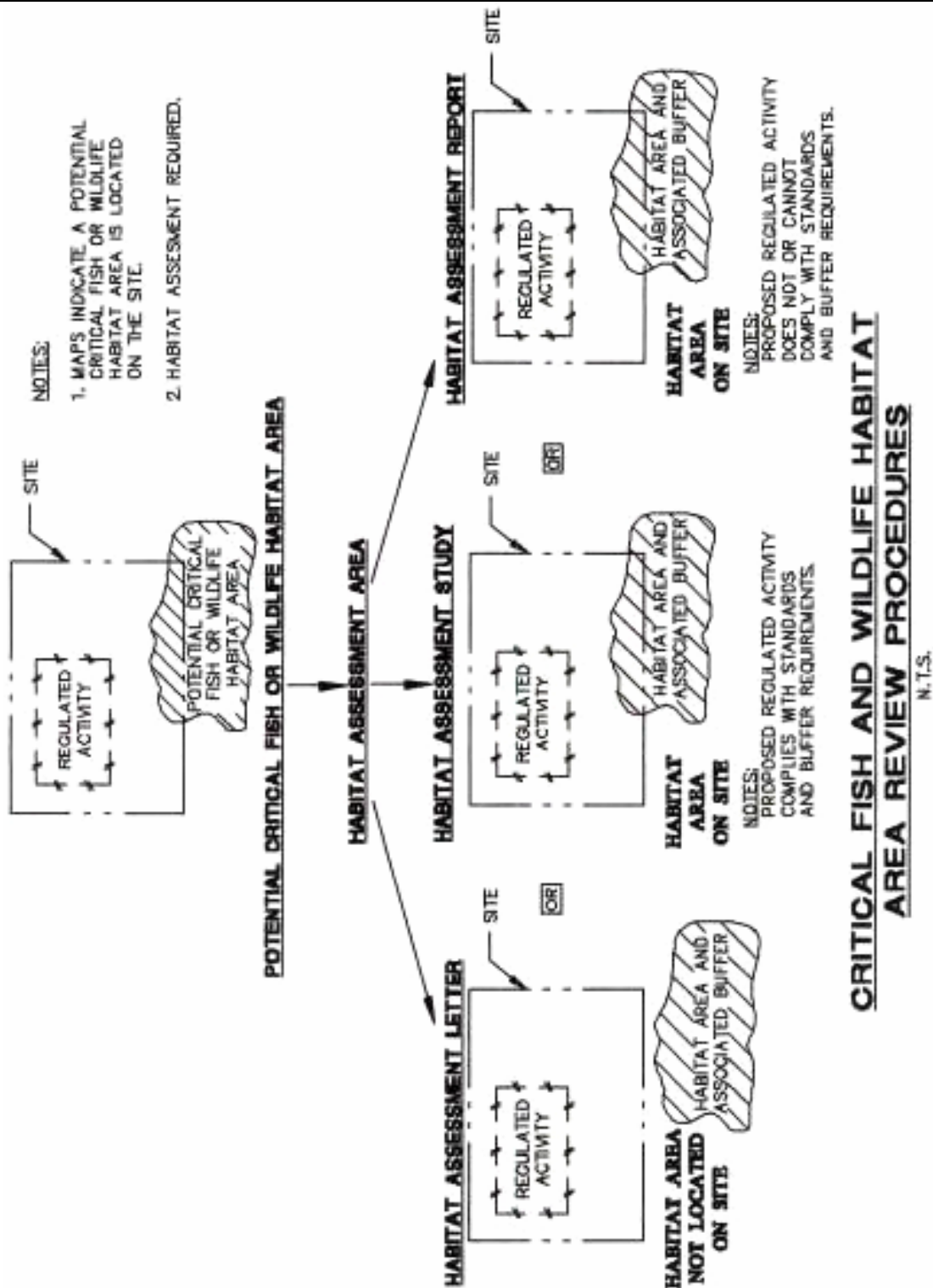
Copied By: DOC

Adopted by: Ord. No. 710

Effective Date: May 2, 2005

FIGURE

18D.40-1



**City of Tenino**  
Community Development Department  
149 S. Hodgden  
Tenino, WA 98589 (360) 264-2368

## CRITICAL FISH AND WILDLIFE HABITAT AREA REVIEW PROCEDURES

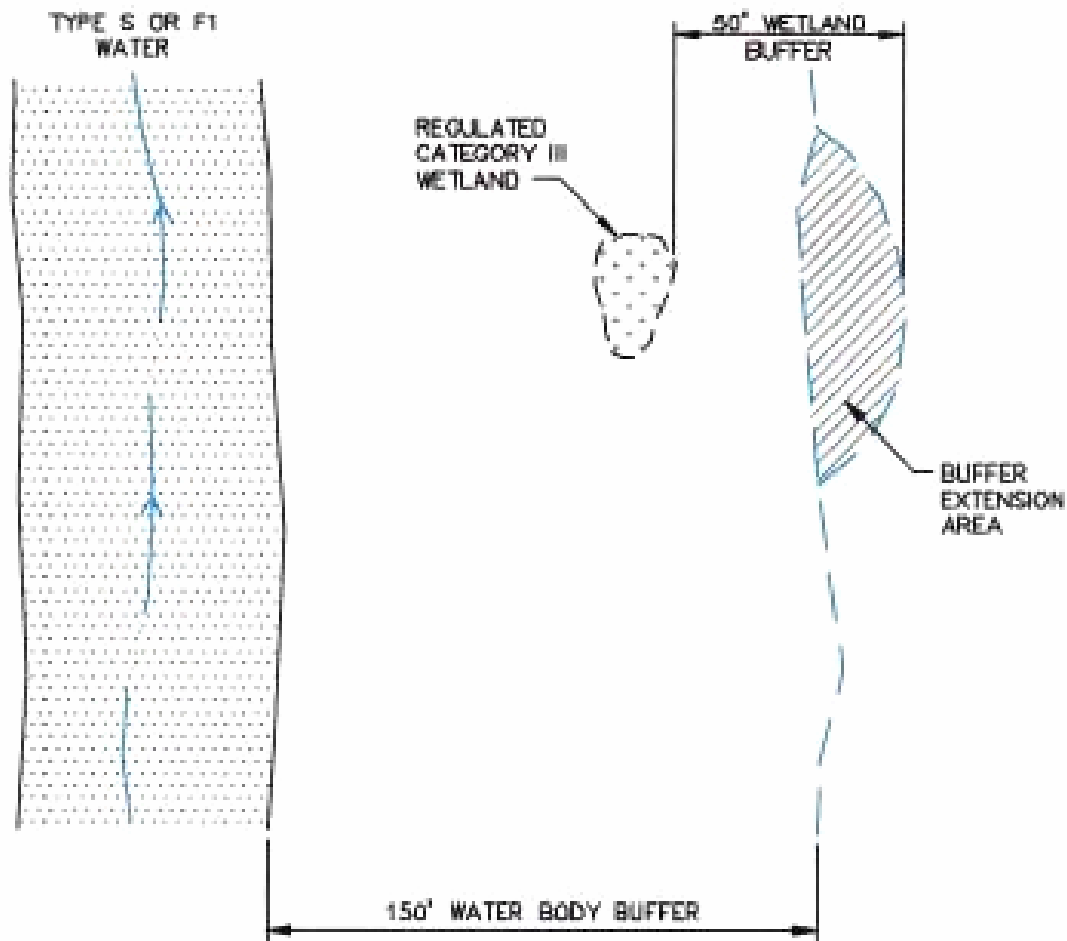
Copied By: DOC

Adopted by: Ord. No. 710

Effective Date: May 2, 2005

FIGURE

18D.40-2



**RIPARIAN BUFFER EXTENSION -**  
**WATER BODY BUFFER EXPANDED TO INCLUDE THE BUFFER OF**  
**THE ADJACENT WETLAND**



**City of Tenino**  
 Community Development Department  
 149 S. Hodgden  
 Tenino, WA 98589 (360) 264-2368

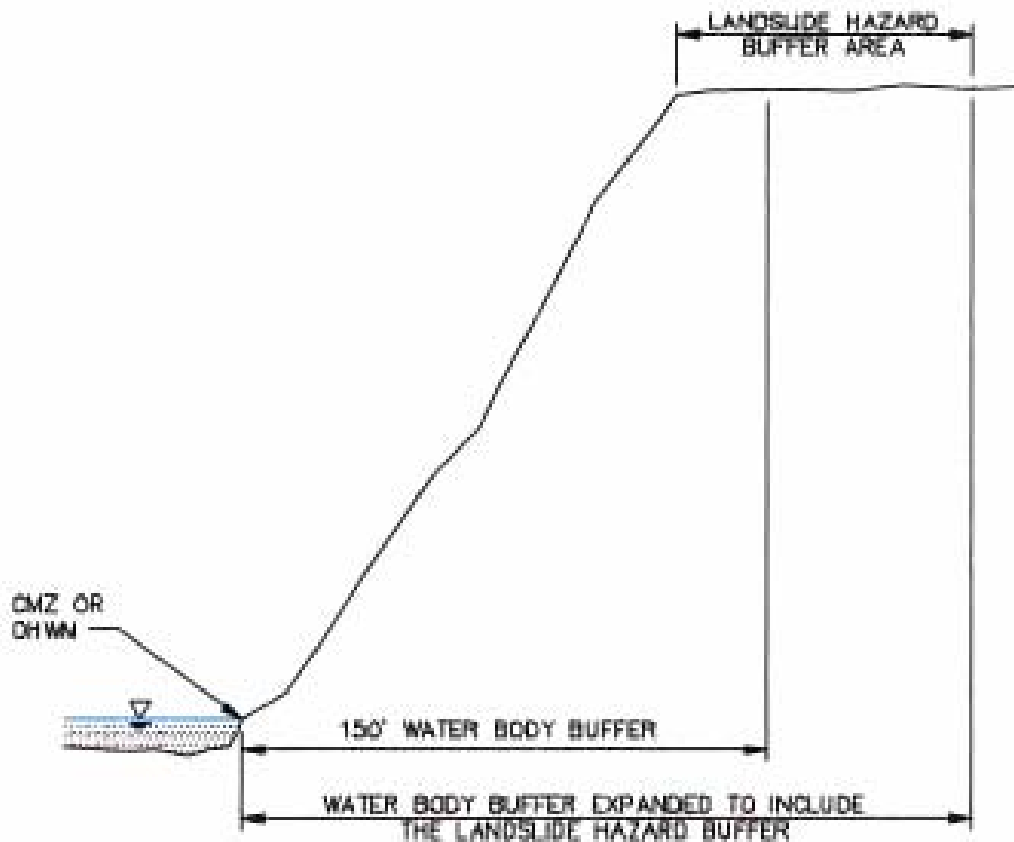
**RIPARIAN BUFFER EXTENSION – WATER  
 BODY BUFFER EXPANDED TO INCLUDE THE  
 BUFFER OF THE ADJACENT WETLAND**

**Copied By: DOC**

**Adopted by: Ord. No. 710**

**Effective Date: May 2, 2005**

**FIGURE 18D.40-3**



**RIPARIAN BUFFER EXTENSION -**  
**WATER BODY BUFFER EXPANDED TO INCLUDE**  
**LANDSLIDE HAZARD BUFFER AREA**

N.T.S.



**City of Tenino**  
 Community Development Department  
 149 S. Hodgden  
 Tenino, WA 98589 (360) 264-2368

**RIPARIAN BUFFER EXTENSION – WATER  
 BODY BUFFER EXPANDED TO INCLUDE  
 LANDSLIDE HAZARD BUFFER AREA**

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**Adopted by: Ord. No. 710**

**Effective Date: May 2, 2005**

**FIGURE 18D.40-4**

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## Chapter 18D.50

### CRITICAL AQUIFER RECHARGE AREAS (CARA) AND WELLHEAD PROTECTION ZONES

#### Sections:

<a href="#">18D.50.010</a>	<b>Purpose.</b>
<a href="#">18D.50.020</a>	<b>Applicability.</b>
<a href="#">18D.50.030</a>	<b>CARA/Wellhead Protection Zones Identification Methodology.</b>
<a href="#">18D.50.040</a>	<b>CARA/Wellhead Protection Zones.</b>
<a href="#">18D.50.050</a>	<b>CARA/Wellhead Protection Zones Review Procedures.</b>
<a href="#">18D.50.060</a>	<b>Aquifer Recharge/Wellhead Protection Zones Standards.</b>
<a href="#">Table 18D.50-1</a>	<b>Requirements within Protection Zones.</b>
<a href="#">Table 18D.50-2</a>	<b>Conditional Activities.</b>

#### **18D.50.010 Purpose.**

- A. The Growth Management Act requires the City of Tenino to designate areas and adopt development regulations for the purpose of protecting areas within the City critical to maintaining ground water recharge and quality. The Growth Management Act, Water Pollution Control Act, Water Resources Act of 1971, and the Ground Water Quality Standards require these actions be taken to protect groundwater quality and quantity such that its use as potable water can be preserved for current and future uses.
- B. This Chapter defines a scientifically valid methodology by which the City of Tenino will designate areas determined to be critical in maintaining both groundwater quantity and quality.
- C. This Chapter specifies regulatory requirements when development within these areas is proposed by avoiding or, where that is not possible, minimizing the risks of contamination from new, expanded, and altered land uses and activities.
- D. To identify and protect aquifer recharge areas based on their vulnerability (i.e., physical susceptibility to contamination and the potential for contamination from existing and allowed uses),
- E. To recognize and maintain the delicate balance between surface water and groundwater in order to preserve essential natural functions and processes, including maintenance of stream flows and temperatures necessary to sustain anadromous fish.
- F. To be consistent with;
  1. RCW [36.70A.170](#) and [172](#);
  2. Public Water Systems Penalties and Compliance, [RCW 70-119A](#);
  3. Washington State Wellhead Protection Program and the Public Water Supplies, [WAC 246-290](#); Dangerous Waste Regulations, [WAC 173-303](#);
  4. The Water Quality Standards for Groundwater of Washington State, [WAC 173-200](#).
- G. To ensure that there is sufficient infiltration of naturally available water at the land's surface to sustain aquifers used as a potable water source and to maintain base flows in streams supporting anadromous fish.

#### **18D.50.020 Applicability.**

- A. This Chapter shall apply to proposals for new development and alteration and expansion of existing uses if any portion of the parcel proposed for development is located in a Critical Aquifer Recharge Areas (CARA)/Wellhead Protection Zone map, or as hereafter amended.

- B. These regulations apply to the one, five and ten-year time of travel zones of wellhead protection area zones.
- C. Activities within a Critical Aquifer Recharge Areas (CARA)/Wellhead Protection Zone shall comply with the requirements specified in Table 18D.50-1 Requirements within Protection Zones. (Ord. 731 § 1, 2007)
- D. Business License Requirement. The City may revoke a business license or take other corrective measures to gain compliance in submittal of a Hazardous Substances Inventory form, even if the activity may be exempt.

**Table 18D.50-1 Requirements within Protection Zones** (Ord. 731 § 1, 2007)

Activity	Requirements Within Protection Zones			Improvements
	Hazardous Substances Inventory Form	Hydrogeological Critical Area Assessment Report	Spill Containment Plan	Stormwater Infiltration
1) Existing or new businesses;  2) New Tenant Improvements conducted within an existing structure.	Hazardous Materials Inventory Form  Form shall be completed with all business license applications	Required for any activity that handles or stores hazardous materials in quantities greater than 20 gallons or 200 pounds	A spill containment plan to identify preventive and corrective actions necessary in the event of hazardous materials spill.	Not required
3) Proposed buildings or structures (other than SF/D residential or associated accessory uses) requiring a land use or building permit.	A Hazardous Materials Inventory form shall be with the application for a land use permit.	Required for any activity that handles or stores hazardous materials in quantities greater than twenty (20) gallons or two-hundred (200) pounds.	A spill containment plan and/or monitoring plan to identify preventative and corrective actions necessary in spill event of hazardous materials.	Required to ensure sufficient groundwater recharge an applicant shall infiltrate SW in all mapped CARA areas using adopted SW manual
4) Residential and associated accessory uses. Accessory uses defined in TMC Title 18B Zoning	Existing residential activities are not affected by the provisions of this Chapter. Residents are encouraged to become familiar with the educational material provided by the City or County for use and handling of household chemicals, pesticides, herbicides and fertilizers and disposal of paints, solvents, gas, oil and other hazardous substances with potential to degrade groundwater.			Stormwater Infiltration is required for all development per adopted SWMM

**18D.50.030 CARA/Wellhead Protection Zones Identification Methodology.** The CARA/Wellhead Protection Zones were delineated using application of the calculated fixed radius approach, per Washington Department of Health guidance ([DOH Publication #331-018](#), April 1995).

**18D.50.040 CARA/Wellhead Protection Zones.**

- A. **General.** CARA/Wellhead Protection Zones are areas that have a critical recharging effect on groundwater used for potable water supplies and/or that demonstrate a high level of susceptibility or vulnerability to groundwater contamination from land use activities.
- B. **CARA Protection Zones.** Land areas categorized as Extremely or Highly susceptible on the CARA map or a use listed in Table 18D.50-2; or
- C. **Wellhead Protection Zones.** Areas within the one, five or ten-year time-of-travel zone boundary of a group “A” public water system well as delineated by the water system purveyor or designee, pursuant to [WAC 246-290-135](#).  
(Ord. 731 § 1, 2007)

## **18D.50.050 CARA/Wellhead Protection Zone Review Procedures.**

### **B. General Requirements.**

1. The City's CARA/Wellhead Protection Zone maps provide an indication of where aquifer recharge and wellhead protection areas are located within the City.
2. The Department will complete a CARA/Wellhead Protection Zone map review for regulated development proposals to determine if the project area for a regulated activity is within a CARA/Wellhead Protection Zone..
3. When Department maps or sources indicate a proposed project area for a regulated activity is located within a CARA Zone categorized as Extreme or High, or in a Wellhead Protection Zone, the Department shall require review as set forth in this Chapter.
4. Any proposed regulated development located in a CARA Zone categorized as Extreme or High or Wellhead Protection Zone, shall comply with the standards set forth in Section 18D.50.060.
5. Any hazardous uses, as defined in Section 18D.50.060, shall require the submittal of a hydrogeologic assessment, either Class "A" or Class "B", as set forth in Section 18D.50.050 B below.
6. The Department may waive some of the critical area protective measure provisions contained in Section 18D.10.080 provided the applicant can present an acceptable alternative to adopted standards.

(Ord. 731 § 1, 2007)

### **C. Hydrogeologic Assessments.**

1. Regulated development in a CARA/Wellhead Protection Zone requires a hydrogeologic assessment prepared by a state licensed geologist/ hydrogeologist.
2. The assessment shall be submitted in the form of a report detailing the subsurface conditions, the design of a proposed land use action, and the facilities operation indicating the susceptibility and potential for contamination of groundwater supplies.
3. The following types of assessments shall be prepared:
  - a. A Class "A" Site Assessment shall be prepared in order to evaluate areas within the boundaries of the CARA categorized as Extreme or High. Areas categorized as Moderate or Low susceptibility generally will not require further site evaluation. Contents should include:
    - 1) Permeability of the unsaturated zone.
    - 2) Location of nearby sensitive areas (wellhead protection zones).
    - 3) Ground water depth and flow direction.
    - 4) Location, construction, and use of existing wells (1/4 mi.).
    - 5) Site map at 1:2,400 (1 inch to 2,000 feet) scale.
    - 6) Activity characterization.
    - 7) Best Management Practices.
    - 8) Contingency Plan.
  - b. A Class "B" Site Assessment to provide detailed information about the hydrogeologic characteristics of the site and to predict the behavior of a contaminant should it reach the underlying aquifer(s). The information required in a Class "B" Site Evaluation should be newly acquired information regarding the risks of allowing conditional activities to go forth. The evaluation report should contain all the information included as part of a Class "A" Site Assessment with the following:
    - 1) Background water quality compiled over at least a one year period.

- 2) Contaminant transport modeling based on potential releases to ground water.
  - 3) Modeling of ground water withdrawal effects.
  - 4) Geologic and hydrogeologic characteristics.
  - 5) Ground water monitoring plan provisions.
  - 6) Other information required by Ecology or the City, including information required under any Washington Department of Ecology [Site Register](#) update.
- (Ord. 731 § 1, 2007)

D. **Storage Tank Permits.** In addition to the requirements set forth in this Title, [Washington Department of Ecology](#), or delegated designee, regulates permits for storage tanks regulates and authorizes permits for underground storage tanks pursuant to [WAC 173-360](#). Ecology regulates the installation, repair, replacement, or removal of underground storage tanks in coordination with the City in consideration of the Wellhead Protection Zones.

#### **18D.50.060 Aquifer Recharge/Wellhead Protection Zones Standards.**

- A. **General.** All regulated activities not exempt or prohibited under the provisions of this Chapter shall ensure sufficient groundwater recharge. In order to achieve sufficient groundwater recharge, the applicant shall comply with City's adopted Stormwater Manual or demonstrate that the infiltration rate for the proposed project area will be the same amount for post-development as the pre-development rate. (Ord. 731 § 1, 2007)
- B. **Prohibited Uses.** Landfills (other than inert and demolition landfills), underground injection wells (Class I, III, and IV), metals mining, wood treatment facilities, pesticide manufacturing, petroleum refining facilities (including distilled petroleum facilities), and the storage of large volumes of petroleum products are prohibited within CARA/Wellhead Protection Zones. (Ord. 731 § 1, 2007)
- C. **Agricultural Activities.** New agricultural activities that do not involve hazardous substance handling or application are allowed within an Extreme or High CARA or Wellhead Protection Zone subject to the following:
  1. An applicant is required to submit a farm management plan prepared by the USDA, NRCS, Thurston Conservation District, or Washington State University Cooperative Extension Office that certifies that water quality and quantity within the aquifer recharge area is maintained. The farm management plan shall at a minimum address the following:
    - a. The limits of the proposed agricultural activities.
    - b. The proposed scope of agricultural activities, including the use of any pesticides, fertilizers, or other chemicals.
    - c. The existing nitrate levels on the site and any proposed increases in nitrate levels.
  2. Integrated Pest Management (IPM) practices for pest control and Best Management Practices (BMPs) for the use of fertilizers, as described by the Washington State University, Pierce County Cooperative Extension Office, shall be utilized.
  3. Nitrate levels at down-gradient property line shall not exceed 2.5 mg/L or, if the background nitrate concentration exceeds 2.5 mg/L, that the concentration will not be increased more than 0.1 mg/L, with the cap being set by Thurston County Public Health & Social Services Department (TCPH&SSD) standards maximum allowable quantities for nitrate concentrations.
  4. Additional protective measures may be required if deemed necessary by the Department or to protect public health or safety.

(Ord. 731 § 1, 2007)

**D. Conditionally Permitted Activities.** Activities that pose a moderate threat to the ground water quality can be permitted if sufficient mitigation measures are imposed and implemented and the use does not adversely affect aquifer recharge or infiltration. A determination of degree of threat includes consideration of the susceptibility of the aquifer and potential of the activity to pollute. The applicant shall employ AKART (all known, available, and reasonable treatment) to ensure that the highest degree of protection is afforded to the aquifer. Conditional uses that may be allowed are listed in the Table 18D.50-2 pursuant to TMC 18.10.040 Process III procedures, provided that the use is also allowed within the designated zone, pursuant to TMC 18B Zoning. Table 18D.50-2 also provides guidance on existing federal or state statutes or regulations pertaining to the specific activity mitigative measures within the protection zones. (Ord. 731 § 1, 2007)

**Table 18D.50-2 Conditional Activities.**

<b>ACTIVITY</b>	<b>STATUTE-REGULATION-GUIDANCE</b>
Above Ground Storage Tanks	Chapter 173-303 -640 WAC
Automobile Washers	Chapter 173-216 WAC, BMPs for Vehicle and Equipment Discharges (WDOE WQ-R-95-56)
Below Ground Storage Tanks	Chapter 173-360 WAC
Chemical Treatment Storage and Disposal Facilities Hazardous Waste Generator ( <i>Boat Repair Shops, Biological Research Facility, Dry Cleaners, Furniture Stripping, Motor Vehicle Service Garages, Photographic Processing, Printing and Publishing Shops, etc.</i> )	Chapter 173-303-182 WAC Chapter 173-303 WAC
Injection Wells	Federal 40 CFR Parts 144 and 146, Chapter 173-218 WAC
On-Site Sewage Systems (Large Scale)	Chapter 173-240 WAC
On-Site Sewage Systems > 14,500 gal/day	Chapter 246-272 WAC, Local Health Ordinances
Solid Waste Handling and Recycling Facilities	Chapter 173-304 WAC
Waste Water Application to Land Surface	Chapter 173-216 WAC, Chapter 173-200 WAC, WDOE Land Application Guidelines, BMPs for Irrigated Agriculture

**E. Non-Hazardous Uses.** Subdivision of land, pursuant to TMC 18E - Subdivisions, residential structures of three or more units, new agricultural activities that do not involve hazardous substance handling or application, and all commercial and industrial sites or activities that do not include or involve hazardous substance processing, handling or processing in CARA/Wellhead Protection Zones are allowed subject to the following standards:

1. Stormwater treatment and control shall be provided in conformance with the adopted City Stormwater Management Manual.
2. Floor drains shall not be allowed to drain to the stormwater system and must be designed and installed to meet the adopted Plumbing Code standards.
3. If any roof venting carries contaminants, then the portion of the roof draining from this area must go through pretreatment pursuant to adopted Plumbing Code standards.
4. All nonresidential vehicle washing must be self-contained or be discharged to a sanitary sewer system, if approved by the sewer utility, and subject to adopted Plumbing Code standards.
5. Integrated Pest Management (IPM) practices for pest control and Best Management Practices (BMPs) for the use of fertilizers as described by the Washington State University.

6. For new or changes in regulated activities served by on-site sewage systems, the applicant must demonstrate to the Thurston County Public Health & Social Services Department (TCPH&SSD) that nitrate levels at the down-gradient property line will not exceed 2.5 mg/L or that, if the background nitrate concentration exceeds 2.5 mg/L, the concentration will not be increased more than 0.1 mg/L, with the cap being set by TCPH&SSD standard maximum allowable quantities for nitrate concentrations.
  7. Additional protective measures may be required if deemed necessary by the City, TCPH&SSD, the Department of Health or Ecology to protect public health or safety. (Ord. 731 § 1, 2007)
- F. **Hazardous Uses - General.** Hazardous substance processing or handling, hazardous waste treatment and storage facilities, animal containment areas, and solid waste facilities within CARA/Wellhead Protection Zones, require a Solid Waste Handling approval/permit, which shall be issued pursuant to Conditional Use Permit review as specified in TMC 18D.40.060D. In addition, approval of these or other uses specified in Table 18D.40-2 shall only be allowed in CARA/Wellhead Protection Zones subject to review and approval of a Class “B” hydrogeologic assessment. Mitigation measures of potentially negative impacts associated with the proposed development may be imposed. At a minimum, the TCPH&SSD, Department of Health and Ecology shall be allowed comment opportunity on all CARA/Wellhead Protection Zones Conditional Use Permit applications. (Ord. 731 § 1, 2007)
- G. **Hazardous Uses - Storage Tanks.** In addition to the requirement to submit a hydrogeologic assessment, the following standards apply to storage tanks in a CARA/Wellhead Protection Zone:
1. **Underground Tanks.** All new underground storage facilities used or to be used for the underground storage of hazardous substances or hazardous wastes shall be designed and constructed so as to:
    - a. Prevent releases due to corrosion or structural failure for the operational life of the tank;
    - b. Be protected against corrosion, constructed of non-corrosive material, steel clad with a non-corrosive material, or designed to include a secondary containment system to prevent the release or threatened release of any stored substance; and
    - c. Use material in the construction or lining of the tank which is compatible with the substance to be stored.
    - d. The installation of underground storage tanks shall also be subject to other state and local permit requirements.
  2. **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, groundwater, or surface waters of Tenino within a CARA/Wellhead Protection Zone.
    - b. A new above ground tank that will contain a hazardous substance will require both a double walled tank and a secondary containment system separate from the tank that will hold 110% of the tank's capacity. The secondary containment system or dike system must be designed and constructed to contain material stored in the tank(s).
- (Ord. 731 § 1, 2007)

## Chapter 18D.60

### VOLCANIC HAZARD AREAS

#### Sections:

[18D.60.010](#) Volcanic Hazard Areas.

[18D.60.020](#) Purpose.

#### **18D.60.010 Volcanic Hazard Areas.**

Volcanic hazard areas are areas subject to pyroclastic flows, lava flows, and inundation by debris flows, mudflows, or related flooding resulting from geologic and volcanic events on Mount Rainier or Mount Saint Helens.

#### **18D.60.020 Purpose.**

The study below, conducted by the U.S. Geological Survey, is the Best Available Science regarding volcanic hazard potential within the City of Tenino. The study indicates that the probability of a volcanic hazard event occurring in Tenino is of such insignificance as to not warrant consideration of a volcanic hazard event as a potential hazard within Tenino.

(1) Hoblitt, R. P.; Walder, J. S.; Driedger, C. L.; Scott, K. M.; Pringle, P. T.; Vallance, J. W., 1998, Volcano hazards from Mount Rainier, Washington, revised 1998: U.S. Geological Survey Open-File Report 98-428, 11 p., 2 plates. [accessed Feb. 11, 2002 at <http://vulcan.wr.usgs.gov/Volcanoes/Rainier/Hazards/>]

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## Chapter 18D.70

### FLOOD HAZARD AREAS

#### Sections:

[18D.70.010](#) Purpose.

[18D.70.020](#) Flood Hazard Areas.

[18D.70.030](#) Flood Hazard Area Review Procedures.

[18D.70.040](#) Flood Hazard Area Standards.

[18D.70.050](#) Appendices.

A. Floodplain/Floodway Analysis.

B. Channel Migration Zone Study.

[18D.70.060](#) Figures.

18D.70-1 Potential Flood Hazard Areas Detailed Study Area.

18D.70-2 Potential Flood Hazard Areas Natural Watercourse.

18D.70-3 Potential Flood Hazard Areas Unstudied Areas.

18D.70-4 Potential Flood Hazard Areas Groundwater Flooding Areas.

18D.70-5 Potential Flood Hazard Areas Potholes.

18D.70-6 Potential Flood Hazard Areas Potholes.

18D.70-7 Potential Flood Hazard Areas Channel Migration Zone.

18D.70-8 Floodway Flood Hazard Area.

18D.70-8 Deep and/or Fast Flowing Water Graph.

18D.70-9 Pothole & B Zone Flood Hazard Area.

18D.70-10 Compensatory Storage.

18D.70-11 Structure with Crawlspace Elevation by Fill.

18D.70-11 Building on Piles, Piers or Columns.

#### **18D.70.010 Purpose.**

The purpose of this Chapter is to promote the public health, safety, and general welfare of the citizens of Tenino. The standards contained in this Chapter are intended to minimize public and private losses due to flood conditions in flood hazard areas and provide special criteria necessary for regulated activities located within flood hazard areas of the City. The following statements describe the purpose of this Chapter:

- A. Protect human life and health;
- B. Minimize expenditure of public money and costly flood control projects;
- C. Minimize the need for rescue and relief efforts associated with flooding;
- D. Minimize prolonged business interruptions;
- E. Minimize damage to public infrastructure, facilities and utilities;
- F. Minimize damage to critical fish and wildlife habitat areas;
- G. Minimize net loss of ecological functions of floodplains;
- H. Ensure that potential buyers are notified that property is in a flood hazard area;
- I. Ensure that those who occupy flood hazard areas assume responsibility for their actions;  
and
- J. Qualify Tenino for participation in the National Flood Insurance Program, thereby giving the citizens of Tenino the opportunity to purchase flood insurance with particular emphasis to those in flood hazard areas.

**18D.70.020 Flood Hazard Areas.** Tenino regulates the following flood hazard areas:

**E. Potential Flood Hazard Areas.**

1. Potential flood hazard areas, as depicted on the Critical Areas Atlas-Flood Hazard Area Map, include:
  - b. **Detailed Study Areas.**
    - (1) FEMA Flood Insurance Rate Map and the A zone Floodway Map.
    - (2) Areas within 300 feet horizontal distance from the base flood elevation established for the mapped A zones (see [Figure 18D.70-1](#)).
    - (3) Areas within 5 feet of vertical height from the base flood elevation established for the mapped A zones.
  - c. **Unstudied Areas.** FEMA Flood Insurance Rate Map unnumbered A zones and B zones and areas within 300 feet horizontal distance from the mapped A zone areas (see [Figure 18D.70-2](#)).
  - d. **Natural Waters/Watercourse.** Areas within five feet of vertical height above the ordinary high water mark of an identified natural watercourse (see [Figure 18D.70-3](#)).
  - e. **Groundwater Flooding Areas.** Areas within 300 feet horizontal distance from a mapped groundwater flooding area (see [Figure 18D.70-4](#)).
  - f. **Potholes.** Areas not identified as a mapped flood hazard area, but within 10 feet of vertical relief from the bottom of an identified pothole or within 2 feet of vertical relief of a potential surface water spillway or other type of outlet (see [Figure 18D.70-5](#) and [Figure 18D.70-6](#)). Potholes may be identified by City topographic mapping, field survey, or site inspections.
  - g. **Channel Migration Zones (CMZs).** Channel Migration Zones shall apply only to those watercourses listed below in 18D.70.020B4. In those areas where detailed CMZ studies have been completed and accepted by the Department, additional horizontal and vertical review threshold criteria (i.e., 300' horizontal and 5' vertical) shall not apply (see [Figure 18D.70-7](#)).
2. The Critical Areas Flood Hazard Areas map may not show all potential flood hazard areas that may be necessary for a specific site analysis. The Department may make interpretations, where needed, as to the approximate location of the boundaries of potential flood hazard areas. When there is a conflict between the elevations and the mapped potential flood hazard area boundaries, the elevations shall govern.
3. Where there is insufficient information shown on the potential flood hazard area maps, the Department may require the applicant to verify that the site is out of the flood hazard area using the flood hazard area review procedures set forth in Section 18D.70.030.

**F. Floodway.** A floodway is an extremely hazardous area due to the depth and/or velocity of floodwaters, which carry debris, potential projectiles, and have erosion potential (see [Figure 18D.70-8](#)). The following areas are regulated by the City as floodways:

1. **Regulatory Floodway.** Regulatory floodway designated by flood hazard area maps.
2. **Deep and/or Fast Flowing Water Areas.** Areas of deep and/or fast flowing water shall be regulated as a floodway. Based on the criteria set forth in Section 18D.70.030 E, the Department shall make the determination after review and approval of applicant's analysis of whether the project site falls within the floodway area based on deep and/or fast flowing waters (see [Figure 18D.70-9](#)).
3. **Potholes and B Zones.** That portion of a pothole and B zone area that is three feet or greater in depth shall be regulated as a floodway (see [Figure 18D.70-10](#)).
4. **Channel Migration Zones (CMZs).**
  - a. Channel migration zones shall be regulated as a floodway.

- b. Channel migration zones are equivalent to the base flood elevation limits (i.e., 100-year floodplain limits).
- C. **Flood Fringe.** All areas subject to inundation by the base flood, but outside the limits of the floodway as set forth in 18D.70.020 B. Those portions of the A and B zones not defined as floodway, and that portion of a pothole and FEMA B zone area that is between 0 feet (base flood elevation) and three feet in depth shall be regulated as a flood fringe.
- D. **Other Areas of Special Flood Hazard.**
  - 1. **Groundwater Flooding Areas.** Groundwater flooding areas are those areas identified by Tenino and shown on flood hazard maps and are subject to flood inundation from subsurface waters that result from a fluctuation of the groundwater table. Groundwater flooding areas shall be regulated as a floodway or flood fringe pothole.
  - 2. **Natural Waters/Watercourse.** Natural waters/watercourse as identified on City topographic, planimetric or orthophoto maps, WDNR stream classification maps, USGS quadrangle maps, or other source maps that are not identified as a flood hazard area on the FEMA maps. That portion of the natural watercourse located between the ordinary high water mark and a topographic elevation five feet above the ordinary high water mark shall be regulated as a floodway or flood fringe. If the applicant chooses to accept the five-foot topographic elevation line above the ordinary high water mark as the base flood elevation (i.e., floodplain elevation limits), a flood study shall not be required for a natural water/watercourse.

#### **18D.70.030 Flood Hazard Area Review Procedures.**

##### **A. General Requirements.**

- 1. The City's Critical Areas Flood Hazard Area map provides an indication of where potential flood hazard areas are located within the City. The actual presence or location of a flood hazard area shall be determined using the procedures and criteria contained in this Chapter.
- 2. The Department will complete a review of the Flood Hazard Area maps, and other source documents, for any development proposal to determine whether the proposed project area for a regulated activity falls within a potential flood hazard area. When there is a conflict between the elevations and the mapped 100- or 500-year floodplain or floodway boundaries, the elevations shall govern.
- 3. When the Department's maps or sources indicate that the proposed project area for a regulated activity is or may be located within a potential flood hazard area, the Department shall require a flood boundary verification survey as outlined in Section C below, and may require a flood study as outlined in Section D below, a deep and/or fast flowing water analysis as outlined in Section E. below, and/or a zero-rise analysis as outlined in Section F below, except for coastal flood hazard areas which shall not be required to submit a flood study, deep and/or fast flowing water analysis, or a zero-rise analysis.
- 4. Any proposed development located within a flood hazard area shall comply with the flood hazard area standards set forth in Section 18D.70.040.
- 5. A FEMA [Letter of Map Amendment](#) (LOMA) or [Letter of Map Revision](#) (LOMR) shall not be submitted to FEMA until review and approval has been granted by the Department. The City shall not recognize any LOMA or LOMR as an amendment to the Department's Flood Hazard maps unless the Department has granted prior approval.
- 6. Unless otherwise stated in this Chapter, the critical area protective measure provisions contained in Section 18D.10.080 shall apply.

**B. Channel Migration Zone Study.**

1. In areas where Tenino has not conducted a detailed channel migration zone study, an applicant may submit an independent channel migration zone study to demonstrate that the channel migration zone limits for those watercourses listed in 18D.70.020 B4 are located inside the 100-year floodplain limits.
2. The channel migration zone study shall be prepared, signed, and dated by a professional engineer or professional geologist with at least five years of experience in fluvial geomorphology, river dynamics, or geotechnical engineering.
3. The channel migration zone study shall, at a minimum, contain the information set forth in section 18D.70.050 Appendix B.
4. The Department shall review the channel migration zone study and either accept the new channel migration zone limits or reject the study and require the use of the 100-year floodplain limits. Once the Department has reviewed and approved the channel migration zone study, the applicant shall be required to provide a flood boundary verification survey, as outlined in Subsection C below, utilizing the newly established channel migration zone limits as the floodway limits.

**C. Flood Boundary Verification Survey.**

1. A flood boundary verification survey that delineates the horizontal and vertical limits of the base flood elevation shall be submitted to the Department when the Department's maps or sources indicate that the proposed project area for a regulated activity is located within a potential flood hazard area.
  - a. Where a base flood elevation has not been determined, a flood study shall be required pursuant to Subsection D below.
  - b. A base flood elevation that has been established through a detailed flood study accepted by the Department may be used in lieu of conducting a flood study.
  - c. The base flood elevation for a natural watercourse shall be established at the five-foot topographic elevation line above the ordinary high water mark.
2. The requirement to submit a flood boundary verification survey may be waived at the Department's discretion, when the Department can determine, using contour elevations, base flood data, orthophotos, and parcel data, that the extent of the regulated activity is clearly above the base flood elevation.
3. The flood boundary verification survey shall be prepared, signed, and dated by a registered land surveyor or professional engineer.
4. The Department shall review the flood boundary verification survey to determine if the proposed development is located within a flood hazard area.
5. If the proposed development lies within the flood hazard area, the limits of the floodway, as well as the base flood elevation shall be shown on the flood boundary verification survey.

**D. Flood Study.**

1. A flood study shall be conducted when the Department's maps or sources indicate that the proposed project area for a regulated activity is, or may be located within, a potential flood hazard area where base flood elevation data is not available through the Flood Insurance Study or other authoritative sources, or when an established base flood elevation is contested. A full engineering analysis to determine the base flood elevation shall be required by the Department. Base flood elevations shall be determined using the detailed methods established in 18D.70.050 Appendix A. The Department may approve alternative methods.
2. The flood study shall be prepared, signed, and dated by a professional engineer.

3. Once the Department has reviewed and approved the flood study, the applicant shall be required to provide a flood boundary verification survey, utilizing the newly established base flood elevation, as outlined in Subsection C above.
- E. Deep and/or Fast Flowing Water Analysis.**
1. When the Department determines that a proposed project area for a regulated activity is located within a flood hazard area, a deep and/or fast flowing water analysis based on [Figure 18D.70-9](#) and 18D.70.050 Appendix A shall be required to determine the floodway limits.
  2. The floodway limits and flood fringe limits identified in the deep and/or fast flowing water analysis shall be depicted on the flood boundary verification survey, as outlined in Subsection C above.
  3. The deep and/or fast flowing water analysis shall be prepared, signed, and dated by a professional engineer.
  4. Deep and/or fast flowing water analysis shall not be required for coastal flood hazard areas.
- F. Zero-Rise Analysis.**
1. When the Department determines that a proposed project area for a regulated activity is located within a flood hazard area, a zero-rise analysis shall be required to determine that no increase in base flood elevation, displacement of flood volume, or flow conveyance reduction will occur as a result of the development.
  2. The zero-rise analysis shall be conducted utilizing [HEC-RAS modeling methodology](#) (Hydrologic Engineering Center – River Analysis System) or by other alternative methodologies approved by the City (see 18D.70.050 Appendix A). The analysis shall show that no rise (0.01 foot or less) has occurred as a result of the proposed development. The proposed development may need to be reduced or specially engineered (such as utilizing piers or pilings) to achieve zero-rise.
  3. The zero-rise analysis shall be prepared, signed and dated by a professional engineer.
  4. The zero-rise analysis shall be documented on the Zero-Rise Analysis Form, as set forth in 18D.70.050 Appendix A, and shall be attached to the flood hazard area permit.
  5. Zero-rise analysis shall not be required for coastal flood hazard areas.
  6. When structures are elevated by pier or pilings and no fill is placed in the flood hazard area, the requirement to submit a zero rise analysis may be waived at the Department's discretion.

#### **18D.70.040 Flood Hazard Area Standards.**

##### **A. General.**

1. New construction done by or for the City, such as bridges, roads, flood control works, revetments, retaining walls, drainage structures, sewer or water lines, parks, or other structures necessary to promote the public's health, safety, and welfare shall be allowed in a flood hazard area when:
  - a. The project is prepared, dated, and stamped by a registered professional engineer in the State of Washington and is designed so the project does not result in any increase in flood levels during the occurrence of the base flood discharge (zero-rise) and shall not obstruct the floodway or cause an adverse impact to critical fish or wildlife habitat or adjacent, cross-channel, or upstream or downstream properties; and
  - b. The improvements utilize appropriate flood hazard protection standards.

2. **Elevation Certificate.** A Federal Emergency Management Agency (FEMA) elevation certificate shall be required for new construction, additions affixed to the side of a structure, and substantial improvements located within flood hazard areas. The most current version of the FEMA elevation certificate must be completed and certified by an engineer or professional land surveyor, currently licensed in the State of Washington, and kept on file by the City.
- B. **Floodways.** Any development, encroachments, filling, clearing or grading, new construction, and substantial improvements shall be prohibited within the floodway, except as allowed in the following standards:
1. Structures that do not require a building permit and that do not have any associated fill.
  2. Agricultural activities that do not require the installation of structures and that do not have any associated fill.
  3. Park and recreational uses and facilities that do not require the installation of structures and that do not have any associated fill.
  4. Individual recreational vehicles, not located in a RV park, that are licensed and ready for highway use and are not permanently attached to the site.
  5. Habitat enhancement/stream restoration activities are permitted subject to the provisions outlined in Section 18D.70.040 D.
  6. Rehabilitation, reconstruction, or an upper story addition to an existing structure that does not exceed the limits for a substantial improvement.
  7. Private bridges may be allowed to cross the floodway provided that the structure meets the requirements contained in Section 18D.70.030 and the following:
    - a. The lowest structural member of a private bridge proposed to cross the floodway portion of any of the rivers listed in Section 18D.70.020 B4 shall be a minimum of six feet above the base flood elevation.
    - b. The lowest structural member of a private bridge proposed to cross the floodway portion of any other watercourse shall be a minimum of one foot above the base flood elevation.
- C. **Flood Fringe Areas.** All activities allowed in Section 18D.70.040B shall be permitted in a flood fringe area. Any other proposed development, encroachments, filling, clearing or grading, new construction, and substantial improvements are prohibited in a flood fringe area except as permitted under the following standards:
1. Structures that do not require a building permit and that do not have any associated fill are permitted.
  2. All other regulated activities shall only be allowed when the proposed development is located on an existing lot of record that was created prior to the effective date of this ordinance. Applicants shall demonstrate there are no other feasible alternatives that would allow the proposed development to occur completely outside the flood hazard area. At a minimum, the following shall be demonstrated:
    - a. The development cannot be located outside the flood hazard area due to topographic constraints of the parcel or size and/or location of the parcel in relation to the limits of the flood hazard area and a building setback variance has been reviewed, analyzed, and rejected as a feasible alternative to encroachment into the flood hazard area; and
    - b. The proposed development shall not cause an adverse impact to adjacent, cross-channel, or upstream or downstream properties.

**3. Roads, Bridges, Trails, and Parking Lots.**

- a. Roads, bridges, driveways, trails, emergency vehicle access, and access routes and easements, where allowed, shall be constructed and armored based on the standards in 18D.70.040 C4 below and elevated a minimum of one foot above the base flood elevation.
- b. Parking lots shall be elevated to a minimum of one-half foot below the base flood elevation.

**4. Grading and Filling.** When development is permitted under this Subsection, it shall be designed to a zero-rise standard as set forth in Section 18D.70.030 F and 18D.70.050 Appendix A. Any filling, grading, or clearing associated with the permitted development shall not increase flood hazards, water velocities, or flood elevations. In addition to meeting the requirements for zero-rise, all permitted development must also meet the following requirements:

- a. **Compensatory Storage.** New excavated storage volume shall be equivalent to the flood storage capacity eliminated by filling or grading within the flood fringe. Equivalent shall mean that the storage removed shall be replaced by equal live storage volume between corresponding one-foot contour intervals that are hydraulically connected to the floodplain through their entire depth (refer to [Figure 18D.70-13](#)).
- b. **Flow Conveyance.** New excavated conveyance areas shall be equivalent to existing conveyance within the flood fringe. Equivalent shall mean a mechanism for transporting water from one point to another using an open channel system.
- c. **Erosion Protection.** Development shall be protected from flow velocities greater than 2 feet per second through the use of bio-engineering methods or, when bio-engineering methods have been deemed insufficient to protect development, then hard armoring may be utilized. All erosion protection shall extend 1 to 3 feet, depending on development requirements, above the base flood elevation and shall be covered with topsoil and planted with native vegetation (see [Figure 18D.70-14](#)).

**5. Critical Facilities.**

- a. New construction, additions affixed to the side of an existing structure, and substantial improvement of hazardous facilities, and special occupancy structures are prohibited.
- b. New construction of an essential facility, reconstruction of an existing essential facility, or additions to an existing essential facility that exceed the threshold for substantial improvement shall be permitted when no feasible alternative site is available outside the flood hazard area. Such regulated activities are subject to the following:
  - (1) Essential facilities with a crawlspace elevated by fill shall have the lowest floor and any utilities and ductwork elevated a minimum of three feet above base flood elevation (see [Figure 18D.70-14](#)).
  - (2) Essential facilities elevated by piers or pilings shall have the finished floor and any utilities and ductwork elevated a minimum of three feet above the base flood elevation and must be designed by a professional structural engineer (see [Figure 18D.70-15](#)).
  - (3) Essential facilities shall be armored based on the standards in Section 18D.70.040 C4 above.
  - (4) Flood proofing and sealing measures must be taken to insure that toxic or explosive substances will not be displaced or released into floodwaters.



6. **Structures.** Single-family, two-family, multi-family, mobile/manufactured homes, commercial, industrial, etc., except for critical facilities as set forth in Section 18D.70.040 C5 above, shall be allowed subject to the following standards:
  - a. New construction, additions affixed to the side of an existing structure, and substantial improvement of any structure with a crawlspace shall have the lowest floor elevated a minimum of two feet above base flood elevation (see [Figure 18D.70-14](#)).
  - b. New construction, additions affixed to the side of an existing structure, and substantial improvement of any structure elevated by piers or pilings shall have the bottom of the lowest horizontal structural member elevated a minimum of two feet above the base flood elevation and must be designed by a professional structural engineer. Electrical, heating, ventilation, plumbing, air-conditioning equipment, and other service facilities and associated ductwork shall be elevated a minimum of two feet above base flood elevation, however, the Department may approve a lesser minimum distance above base flood elevation provided that the systems are designed to prevent floodwater from entering or accumulating within the components (see [Figure 18D.70-15](#)). Areas below the lowest horizontal structural member shall not be enclosed and shall remain free of obstructions.
7. **Agricultural Accessory Structures.** The lowest floor in an agricultural accessory structure shall be located at the base flood elevation or higher provided that the structure be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a professional engineer in the State of Washington or must meet or exceed the following minimum criteria:
  - a. Minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided;
  - b. The bottom of all openings shall be no higher than one foot above grade; and
  - c. Openings may be equipped with screens, louvers, or other covering or devices provided that they permit the automatic entry and exit of floodwaters.
8. **Construction Standards.**
  - a. Construction of a basement is prohibited.
  - b. Crawl spaces shall be backfilled with clean earth material and shall meet Building Code requirements. Finished grade within the crawlspace shall be at least two feet above the base flood elevation.
  - c. Flood proofing in lieu of elevating the structure is prohibited.
  - d. All single-family, two-family, multi-family, mobile/manufactured homes, commercial, and industrial structures shall be placed on standard concrete stemwall/footing foundations or piles, piers, or column foundations and engineered pursuant to Building Code requirements.
9. **Sewage Disposal and Potable Water Installation.**
  - a. New and replacement public water sources (i.e., wells and water supply lines) and public sanitary sewage conveyance systems are allowed. These systems shall be designed to withstand scour resulting from flow velocity, minimize or eliminate infiltration of floodwaters into the systems, and minimize or eliminate discharge from the systems into floodwaters.
  - b. All replacement wells and replacement on-site sewage system (OSS) shall be designed to minimize or eliminate impairment to them or contamination from/to



them during flooding (i.e., infiltration of floodwaters into or discharge out of the systems). They shall not be located in pothole or no-outlet floodplains.

- c. All new individual wells and new on-site sewage system (OSS) shall be prohibited. Conveyance systems from a structure to a well or OSS located outside of the flood hazard area shall be allowed provided these systems are designed to meet the standards in Section.18D.70.040 C3 above.

**D. Alteration of Watercourses.** Any alteration of a watercourse shall comply with the following standards:

1. The City will notify adjacent communities and the Washington State Department of Ecology prior to any alteration or relocation of a watercourse proposed by the applicant and submit evidence of such notification to the Federal Insurance Administration.
2. The City shall require that maintenance be provided within the altered or relocated portion of said watercourse, so that the flood-carrying capacity is not diminished. Therefore, if the maintenance program calls for future cutting of planted native vegetation used in performing the alternation, the system shall be oversized at the time of construction to compensate for said vegetation growth or any other natural factor that may need future maintenance.
3. Alterations and relocations, including stabilization projects, shall not degrade fish habitat and shall be subject to the following provisions:
  - a. Structures that cross all watercourses and water bodies shall meet fish habitat requirements of WDFW.
  - b. Any culverts that are used on fish-bearing watercourses shall be arch/bottomless culverts or equivalent that provide comparable fish protection, and must meet fish habitat requirements of the latest edition of WDFW's [Design Manual for Culverts](#).
  - c. Bridges or other crossings shall allow for uninterrupted downstream movement of wood and gravel, be as close to perpendicular to the watercourse as possible, and be designed to minimize fill and to pass the base flood flows.
  - d. Watercourse alterations shall maintain natural meander patterns, channel complexity, and floodplain connectivity. Where feasible, such characteristics shall be restored as part of the watercourse alteration.
  - e. The applicant shall identify the channel migration zone for the watercourse at the project site and for a reasonable reach upstream and downstream of the site, and shall not undertake actions as part of the alteration that would in any way inhibit movement of the channel.
  - f. Existing culverts that do not meet fish habitat requirements shall be removed or replaced as part of the approved watercourse alteration project.
  - g. Watercourse alteration projects shall not result in a fish blockage of side channels. Known fish barriers into side channels shall be removed as part of the approved watercourse alteration project.
  - h. For any watercourse alteration of a Type S or F water (pursuant to Section 18D.40.060 B) whose channel is subject to migration, bioengineered (soft) armoring of streambanks is required to allow for woody debris recruitment, gravels for spawning, and creation of side channels. The bioengineering technique used must be designed in accordance with the latest edition of WDFW's [Integrated Streambank Protection Guidelines](#).
4. The project engineer shall design the watercourse alteration so the activity does not increase the water surface elevation (zero-rise); decrease the capacity, storage, and

conveyance of the watercourse; or cause an adverse impact to adjacent, cross-channel, or upstream or downstream properties.

**18D.70.050 Appendices.**

- A. [Floodplain/Floodway Analysis.](#)
- E. [Channel Migration Zone Study.](#)

**18D.70.060 Figures.**

- 18D.70-1 [Potential Flood Hazard Areas Detailed Study Area.](#)
- 18D.70-2 [Potential Flood Hazard Areas Unstudied Areas.](#)
- 18D.70-3 [Potential Flood Hazard Areas Natural Watercourse.](#)
- 18D.70-4 [Potential Flood Hazard Areas Groundwater Flooding Areas.](#)
- 18D.70-5 [Potential Flood Hazard Areas Potholes.](#)
- 18D.70-6 [Potential Flood Hazard Areas Potholes.](#)
- 18D.70-7 [Potential Flood Hazard Areas Channel Migration Zone.](#)
- 18D.70-8 [Floodway Flood Hazard Area.](#)
- 18D.70-9 [Deep and/or Fast Flowing Water Graph.](#)
- 18D.70-10 [Pothole & B Zone Flood Hazard Area.](#)
- 18D.70-11 [Compensatory Storage.](#)
- 18D.70-12 [Structure with Crawlspace Elevation by Fill.](#)
- 18D.70-13 [Building on Piles, Piers or Columns.](#)

**APPENDIX A**

**FLOODPLAIN/FLOODWAY ANALYSIS**

This Appendix describes the flood hazard analyses and studies as required by Title 18D.70, Flood Hazard Area Chapter. Flood hazard studies establish the base flood elevation and delineate floodplain and/or floodway(s) when a proposed project contains or is adjacent to a river, stream, lake, or closed depression.

Flood hazard studies must conform to FEMA regulations described in Part 65 of 44 Code of Federal Regulations (CFR). In addition, the following information must be provided and procedures performed for flood hazard studies used under Chapter 18D.70 to examine development proposals or improvements within a floodplain.

**I. FLOODWAY DETERMINATION**

The City recognizes two distinct floodways. The FEMA floodway describes the limit to which encroachment into the natural conveyance channel can cause one foot or less rise in water surface elevation. The deep and/or fast flowing (DFF) water floodways are hazardous areas and conditions of the floodplain for both people and habitable structures. Life safety and protection to improved properties are compromised if encroached upon. Encroachment cannot occur within these areas.

**A. FEMA Floodways.**

1. FEMA floodways are determined through the procedures outlined in the FEMA publication Guidelines and Specifications for Study Contractors using the 1-foot maximum allowable rise criteria.
2. Transitions shall take into account obstructions to flow such as road approach grades, bridges, piers, culverts, or other restrictions. General guidelines for transitions may be found in HEC-RAS, [Water Surface Profiles-Users Manual, Appendix IV](#), Application of HEC-RAS Bridge Routines, published by the Hydrologic Engineering Center, Davis, California.

**B. Deep and/or Fast Flowing (DFF) Floodways.**

1. DFF floodways are generally assumed to include the entire 100-year floodplain until the Department approves a detailed floodway analysis that defines areas of DFF within the entire floodplain area based on the criteria.
2. The hydraulic model must adequately be calibrated to known or recorded stage elevations of past flood events with computed recurrence frequency intervals for the 100-year flood recurrence interval. This is to ensure model accuracy.

**II. FLOOD STUDY CONTENT AND REQUIRED INFORMATION**

Three copies of the completed floodplain/floodway analysis study report and the modeling digital files shall be submitted. The report submittal must be stamped by a licensed professional civil engineer and include the following information in addition to that required for the drainage plan of a proposed project:

**A. Floodplain/Floodway Map.**

1. A scaled survey base map stamped by a licensed professional land surveyor registered in the State of Washington. The map must accurately locate the proposed development with respect to the floodplain and floodway, the channel of the subject stream, river, and/or pothole location, and the existing improvements within the subject study area. It must also supply all pertinent information such as the nature of the proposed project, legal description of the property on which the project would be located, fill quantity, limits and elevation, the building floor elevations, and use of compensatory storage.
2. The map must show elevation contours at a minimum of 2-foot vertical intervals and shall comply with survey and map guidelines published in the FEMA publication *Guidelines and Specifications for Study Contractors*. The map must show the following:
  - a. Elevations and ground contours, spot elevations, and vertical datum NAVD 88 (North American Vertical Datum of 1988) (or most recent vertical datum accepted by the Department).
  - b. Elevations and dimensions of existing structures, fill, and compensatory storage areas.
  - c. Size, location, elevation and spatial arrangement of all proposed structures on the site.
  - d. Location and elevations of roadways, drainage facilities, water supply lines, and sanitary sewer facilities.
  - e. Areas of DFF must clearly be shown and plotted on the map sheet depicting the bounded area of the floodway on both sides of the study channel through the subject site. DFF floodway studies must reflect all transitions as referenced above as well.
  - f. The base maps must also be accompanied by all field survey notes/computations, drawings, etc. for each cross-section with water surface elevation at the time the cross section field survey was done.

**B. Study Report.**

1. Soil maps, groundcover maps, and photographs.
2. A narrative report containing the purpose of the study and description of the study area, data collection, methodology for both the hydrology and hydraulics, detailed discussion on the input parameters used, modeling results, and conclusions.
3. A floodplain/floodway analysis must include calculations and all computer analysis input and output information, supporting graphical illustrations, as well as the following additional information:
  - a. Scaled cross-sections showing the current/existing conditions of the river/stream channel, the floodplain adjoining each side of the channel, the computed floodway, the cross-sectional area to be occupied by any proposed development and all historic high water information.
  - b. Profiles showing the bottom of the channel, the top of both left and right banks and computed base flood water surface elevations for the 10, 25, 50 and 100-year events.
  - c. Plans and specifications of any flood protection for structures, construction areas, filling, dredging, channel improvements, storage of materials, water supply, and sanitary facilities within the floodplain.
  - d. Complete printout of input and output data of the model that was used for the analysis. Liberal use of comments and written discussion will assist considerably in understanding the model logic and minimize misinterpretations and/or questions.
  - e. A map, showing the graphical/plotted location and limits of the computed floodway and/or floodplain.

- f. Three copies of ready-to-run digital files of both the hydrologic and hydraulic model and its input and output files used in the study. Data shall be submitted on a disk in standard ASCII format, ready to use on an IBM-compatible personal computer and in the applicable software application (i.e., [HEC-RAS](#), [Hydrological Simulation Program--Fortran](#) - HSPF, SBUH, etc.).
  - g. A section on the flood flow including computer modeling and/or calculations (see below for additional requirements on flood flow determinations).
  - h. Aerial photographs of the site including pre-Feb. 1996 and post-Feb. 1996 photos of the site.
  - i. All field survey notes/computations, maps, and drawings for each cross-section with water surface elevation at the time of the cross-section field survey.
- C. **Computer Modeling Information.** Floodway/floodplain studies submitted to the City for review must include output summary tables and include the following (but not limited to) items:
- 1. Cross-section(s) identification number.
  - 2. Range of flows being examined.
  - 3. Computed water surface elevation at each cross-section.
  - 4. Energy grade line at each cross-section.
  - 5. Graphical plots of the channel cross-sections with computed water surface elevations for all model runs including calibrated model runs.
  - 6. All model input and output printouts.
  - 7. Graphical plots of the model output data that shows the points and segments along each cross-section where deep and/or fast flowing water occurs. This shall include cross section plots of depth and velocity in one-unit increments. The plots shall also be accompanied with a table listing the station distance (right and left bank), flow rate, area, hydraulic depth, velocity, and whether each point is a floodway.
  - 8. A plan sheet clearly showing the graphical representation of the bounded area of the floodway based on DFF criteria through the entire study site and reach. Note that identified islands or pockets within the middle of the bounded floodway area are generally considered as part of the floodway, unless otherwise approved by the Department.
  - 9. Discussion on the starting water surface elevation for the hydraulic model.

### III. DETERMINING FLOOD FLOWS

The three techniques used to determine the flows used in a flood study depend on whether gage data is available, whether a basin plan has been adopted, or a detailed flood study has been done and approved for use by the Department. The first technique is for basins with adopted basin plan areas. The second technique is used if a gaging station exists on the stream. The third technique is used on un-gaged catchments or those with an insufficient length of record. In all cases, the engineer shall be responsible for assuring that the hydrologic methods used are technically reasonable, conservative, conform to the FEMA publication, [Guidelines and Specifications for Study Contractors](#), and are acceptable by FEMA and the Department.

- A. **Flood Flows from Adopted Basin Plan Information.** Flood flows may be determined using information from the City's basin plan (if available). The hydrologic model used in the basin plan shall be updated to include the latest changes in zoning or any additional

information regarding the basin which has been acquired since the adoption of the basin plan.

- B. **Flood Flows from Stream Gage Data.** Determining flood flows from stream gage data uses the Log-Pearson Type III distribution method as described in the [Guidelines for Determining Flood Flow Frequency, Bulletin 17B of the Hydrology Committee, United States Water Resources Council](#) (revised October 1981).

1. This technique may be used only if data from a gaging station in the basin is available for a period of at least 10 years.
2. If the difference in the drainage area on the stream at the study site and the drainage area to a gaging station on the stream at a different location in the same basin is less than or equal to 50%, the flow at the study site shall be determined by transferring the calculated flow at the gage to the study site using a drainage area ratio raised to the 0.86 power, as in the following equation:

$$Q_{ss} = Q_s (A_{ss} / A_g)^{0.86}$$

where

$Q_{ss}$  = estimated flow for the given return frequency on the stream at the study site.

$Q_g$  = flow for the given return frequency on the stream at the gage site.

$A_{ss}$  = drainage area tributary to the stream at the study site.

$A_g$  = drainage area tributary to the stream at the gage site.

3. If the difference in the drainage area at the study site and the drainage area at a gaging station in the basin is more than 50% and a basin plan has not been prepared, a continuous model shall be used as described below to determine the flood flows at the study site.
  4. In all cases where dams or reservoirs, floodplain development, or land use upstream may have altered the storage capacity or runoff characteristics of the basin so as to affect the validity of this technique, a continuous model shall be used to determine flood flows at the study site.
- C. **Flood Flows from a Calibrated Continuous Model.** Flood flows may be determined by utilizing a continuous flow simulation model such as HSPF or other equivalent continuous flow simulation model, as approved by the City. Where flood elevation or stream gaging data are available, the model shall be calibrated to the known data. Otherwise, regional parameters may be used.

#### IV. DETERMINING FLOOD ELEVATIONS, PROFILES and FLOODWAYS (Hydraulic Model)

- A. **Reconnaissance.** The applicant's project engineer is responsible for the collection of all existing data with regard to flooding in the study area. This shall include a literature search of all published reports in the study area and adjacent communities and an information search to obtain all unpublished information on flooding in the immediate and adjacent areas from Federal, State, and local units of government. This search shall include specific

information on past flooding in the area, drainage structures such as bridges and culverts that affect flooding in the area, available topographic maps, available community maps, photographs of past flood events, and general flooding problems within the community. Documented discussions with nearby property owners should also be done to obtain a witness account of the flooding extent. A field reconnaissance shall be made by the applicant's project engineer to determine hydraulic conditions of the study area, including type and number of structures, locations of cross-sections, and other parameters including the roughness values necessary for the hydraulic analysis.

- B. **Base Data.** Channel cross-sections used in the hydraulic analysis shall be current/existing at the time the study is performed and shall be obtained by field survey. Topographic information obtained from aerial photographs/mapping may be used in combination with surveyed channel cross sections in the hydraulic analysis. The elevation datum of all information used in the hydraulic analysis shall be verified. All information shall be referenced directly to NAVD 1988 (and include local correlation to NGVD) unless otherwise approved by the City.
- C. **Methodology.** Flood studies and analysis (including deep and/or fast flowing floodways and zero-rise analysis) shall be calculated using the U.S. Army Corps of Engineers HEC-RAS computer model (or subsequent revision) unless otherwise approved by the City.
- D. **Adequacy of the Hydraulic Model.** Tenino considers the following (but not limited to) factors when determining the adequacy of the hydraulic model for use in the floodway/floodplain model:
  - 1. Cross-section of a downstream starting location and spacing.
  - 2. Differences in energy grade line (significant differences in the energy grade line from cross-section to cross-section are an indication that cross-sections should be more closely spaced or that other inaccuracies exist in the hydraulic model.)
  - 3. Methods and results for analyzing the hydraulics of structures such as bridges and culverts.
  - 4. Lack of flow continuity.
  - 5. Use of a gradually varied flow model. In certain cases, rapidly varied flow techniques may need to be used in combination with a gradually varied flow model such as weir flow over a levee, flow through a spillway of a dam, or special application of bridge flow (pressure flow if bridge superstructure is shown to be submerged for the study event).
  - 6. [Mannings "n" value.](#)
  - 7. Calibration of hydraulic model to known and/or observed flow stage elevations including past flood events.
  - 8. Special applications. In some cases, steady state-one dimensional hydraulic models may not be sufficient for preparing the floodplain/floodway analysis. This may occur where sediment transport, two-dimensional flow, or other unique hydraulic circumstances affect the accuracy of the model. In these cases, the project engineer must propose and obtain Department approval of alternative models for establishing the water surface elevations.
  - 9. All reported error and/or warning messages by the model must be properly and adequately addressed and/or resolved and included in the report for review verification.

## **V. ZERO-RISE ANALYSIS (ZRA)**

- A. Zero-rise analysis (ZRA) is required where encroachment within the flood fringe area is allowed and approved by the Department. The ZRA must show that the proposed development encroachment in the flood fringe area will not show a measurable rise in the base flood elevation (i.e., less than 0.01 foot), resulting from a comparison of existing conditions and proposed conditions. This is directly attributable to development in the floodplain but not attributable to manipulation of mathematical variables such as roughness factors, coefficients, discharge, and other hydraulic parameters.
- B. In addition to those items listed in A above, the following shall be included in a ZRA:
  - 1. Floodway boundaries (based on zero-rise) are to follow the stream lines and reasonably balance the rights of property owners on either side of the floodway. Use of the automatic equal conveyance encroachment option in the model will be considered equitable.
  - 2. The ZRA must include a sufficient number of cross-sections in order to accurately model the subject fill and compensatory storage areas of the site. In all cases, cross-sections shall be located downstream, through the subject site and upstream of the site at a very minimum. They shall also be located where changes in channel and the fill material characteristics occur, such as slope, shape, and roughness. The sections shall also be located perpendicular to the flow path in the channel and the outside overbank areas. The Department shall review and approve the proposed number and location of cross-sections. All cross-sections and surveys shall be prepared and certified by a professional land surveyor or registered professional engineer in the State of Washington.
  - 3. The difference between two profiles of water surface elevation at the cross section (e.g. difference between existing and encroached water surface). The model must report 0.01-ft or less an allowable change in the water surface elevation. This must be shown in the profile graphical plot as well.
  - 4. The difference between profiles of the energy grade line at the cross-section. The model must report 0.01-ft or less. This is the allowable change in the energy grade line. This must be shown in the profile graphical plot as well.
- C. Conveyance Capacity:
  - 1. The ZRA must also show that the proposed development encroachment in the flood fringe area will not show a measurable decrease (less than 0.01 CFS) in the conveyance capacity of the channel, resulting from a comparison of existing conditions and proposed conditions, for each of the cross sections. This is also directly attributable to development in the floodplain but not attributable to manipulation of mathematical variables such as roughness factors, coefficients, discharge, and other hydraulic parameters.
  - 2. The analysis must provide calculations of the reduction in conveyance caused by the proposed development encroachment, assuming no change in the water surface elevation, and using the roughness coefficient value(s) appropriate for the proposed development.
  - 3. The analysis must then provide calculations for the increase in conveyance of the proposed compensatory measure, using the roughness coefficient value(s) appropriate for the proposed development.
  - 4. Include a comparison analysis and discussion from C2 and 3 above. The comparison must adequately show that the conveyance capacity has not measurably decreased between the existing condition and proposed development condition.



## Floodplain/Floodway Zero-Rise Certification

This is to certify that I am a duly qualified professional engineer licensed to practice in the State of Washington.

This is to further certify that the attached floodplain/floodway Zero-Rise Analysis conclusively shows that the proposed development of:

\_\_\_\_\_  
(Name of Development)

\_\_\_\_\_  
Parcel Number

will not increase the 100-yr base flood elevation(s) and widths nor reduce the conveyance capacity of the floodplain/floodway and its associated channel to the

\_\_\_\_\_  
(Name of River, Stream, Pothole or other Watercourse)

### Supporting Data

Base Flood Elevation (Pre-Development) = \_\_\_\_\_ FT (NAVD 88)

Base Flood Elevation (Post-Development) = \_\_\_\_\_ FT (NAVD 88)

Conveyance Capacity (Pre-Development) = \_\_\_\_\_ CFS

Conveyance Capacity (Post-Development  
with compensatory storage) = \_\_\_\_\_ CFS

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Title

\_\_\_\_\_  
Firm Name

\_\_\_\_\_  
Address

\_\_\_\_\_  
City

\_\_\_\_\_  
State

\_\_\_\_\_  
Zip Code

Seal, Signature, and Date

## **APPENDIX B**

### **CHANNEL MIGRATION ZONE STUDY REQUIREMENTS**

The Channel Migration Zone (CMZ) is the area within the lateral extent of likely stream channel movement due to stream bank destabilization and erosion, rapid stream incision, and shifts in location of stream channels. The CMZ will define areas in which, to the best information available, development should be regulated due to the dangers expected from erosion.

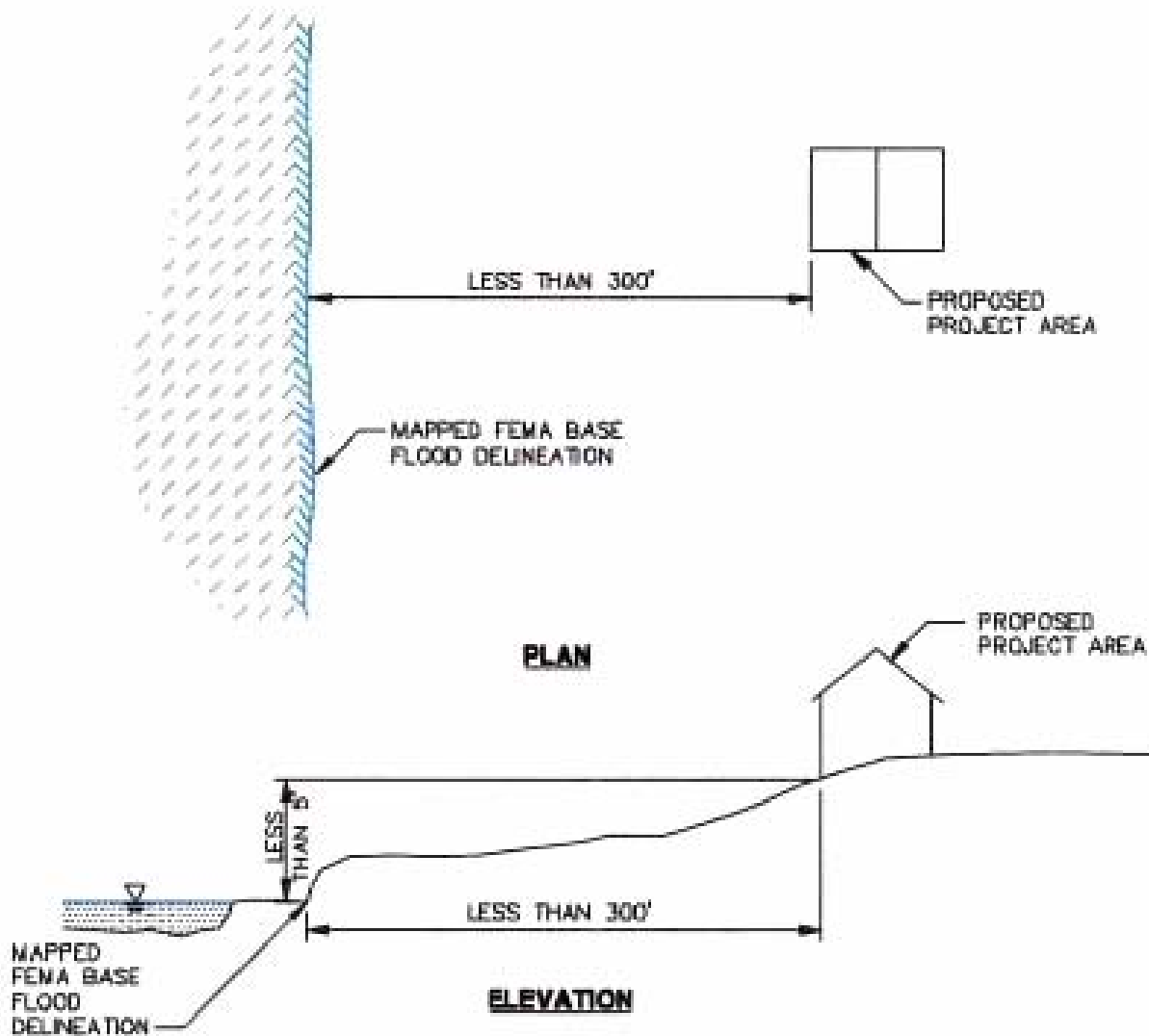
#### **I. DETERMINING CHANNEL MIGRATION ZONE LIMITS**

- A. The CMZ shall be based on available historic records of channel migration, or 100 years of calculated channel migration whichever is greater, and will generally include those areas that encompass:
  - 1. The limit of geologic controls, such as hill slope, bedrock outcrop, or abandoned floodplain terrace;
  - 2. Side channels, abandoned channels, and oxbows; and
  - 3. Outside edges of progressive bank erosion at meander bends.
- B. Channel migration over the 100-year time frame can be estimated and predicted from geomorphic analysis of annual bank erosion rates, historic meander belt width, and measured meander bend amplitudes, potential avulsion sites, and previous river channel locations as depicted on historic aerial photographs and maps. The 100-year time span represents the time required to grow mature trees that can provide functional large woody debris to streams.
- C. The CMZ boundaries will be determined using the following specific criteria:
  - 1. The representative average annual rate of channel migration in the affected river reach is calculated by dividing the lateral distance eroded with the corresponding elapsed time shown in sequential aerial photographs or historic maps (distance/time = channel movement). Measurements from reaches that have had some form of bank armoring shall not be included. Historical records will need to be checked closely for this information.
  - 2. Identify the width of the channel migration zone by multiplying the representative average annual erosion rate by 100 years.
- D. Areas separated from the active channel by legally existing artificial channel constraints (levees, roads, driveways, etc.) that limit bank erosion and channel avulsion to the 100-year recurrence interval flood elevation plus three feet of freeboard shall serve as a boundary for the outer limit of the CMZ.

#### **II. CHANNEL MIGRATION ZONE STUDY CONTENT AND REQUIRED INFORMATION**

Three copies of the completed channel migration zone study shall be submitted. The study submittal must be stamped by a licensed professional engineer or professional geologist with five years experience in fluvial geomorphology, river dynamics, or geotechnical engineering. The CMZ study shall include the following information in addition to that required for the drainage plan of a proposed project. The CMZ study will consist of a written technical report including:

- A. Detailed methods, techniques, and assumptions used in determining the location of the CMZ.
- B. A vicinity map and site with scale, north arrow, and parcel number(s) or specific site being studied.
- C. A clear statement of the requested revision to the City's determination of the 100-year floodplain limits as the CMZ.
- D. A clearly stated conclusion of the study results that support the requested revision. The conclusion needs to document the basis for the revision, show how the data presented refutes the 100-year floodplain limits as the CMZ, and calculates the new results using the new information.
- E. A map clearly delineating the subject property and the CMZ of the adjacent watercourse. In addition to providing a hard copy of the CMZ map, the CMZ map shall also be provided in ArcView shapefile format. Contact the [City GIS Department](#) for mapping and aerial imaging standards.



NOTE: AS SHOWN ABOVE, AREAS LESS THAN 300' HORIZONTAL DISTANCE FROM THE MAPPED FEMA BASE FLOOD DELINEATION, AND AREAS LESS THAN 5' VERTICAL HEIGHT ABOVE THE ESTABLISHED BASE FLOOD ELEVATION, ARE WITHIN THE POTENTIAL FLOOD HAZARD AREA

## POTENTIAL FLOOD HAZARD AREAS DETAILED STUDY AREAS

NTS



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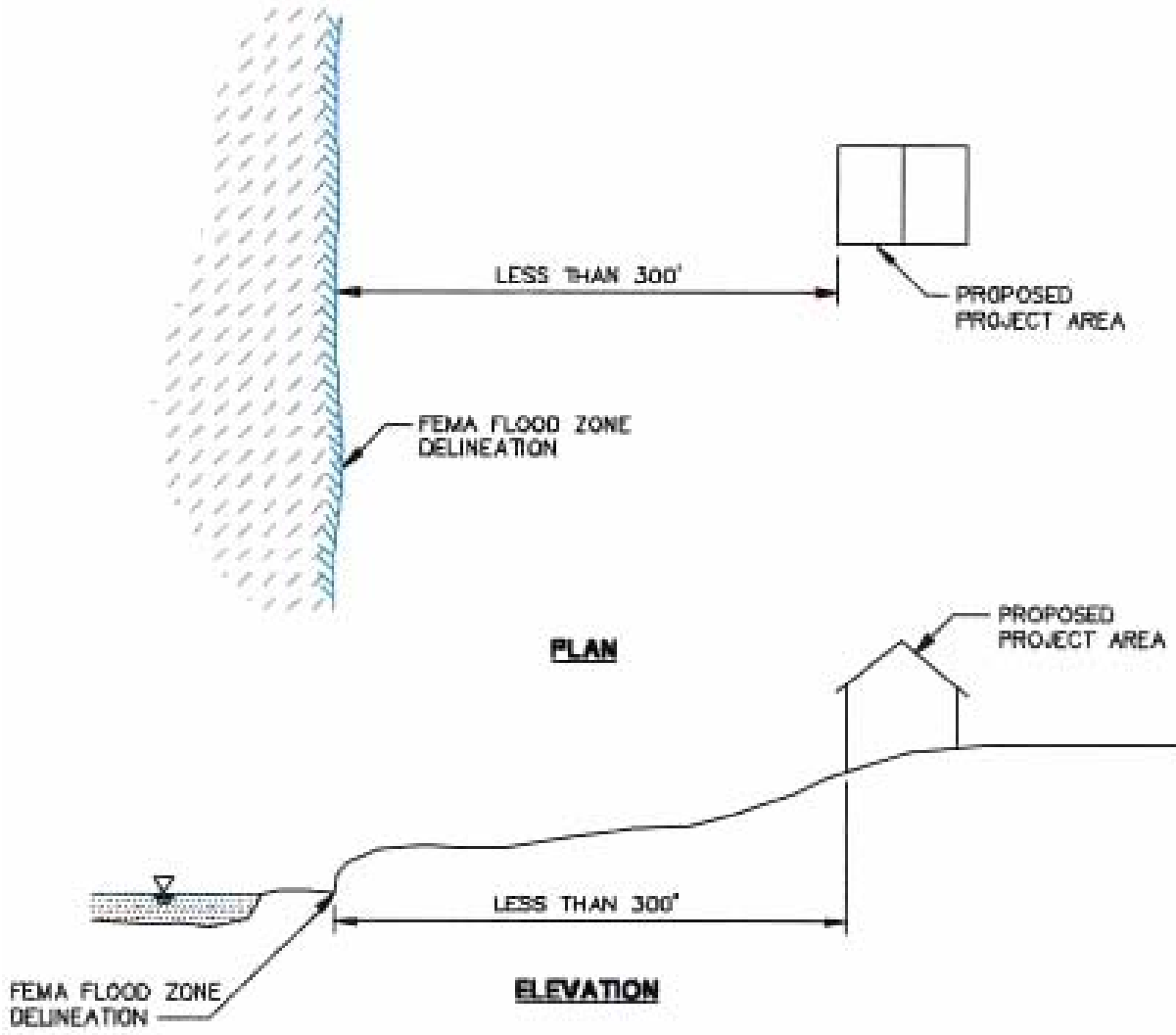
## POTENTIAL FLOOD HAZARD AREAS DETAILED STUDY AREA

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Effective Date: May 2, 2005

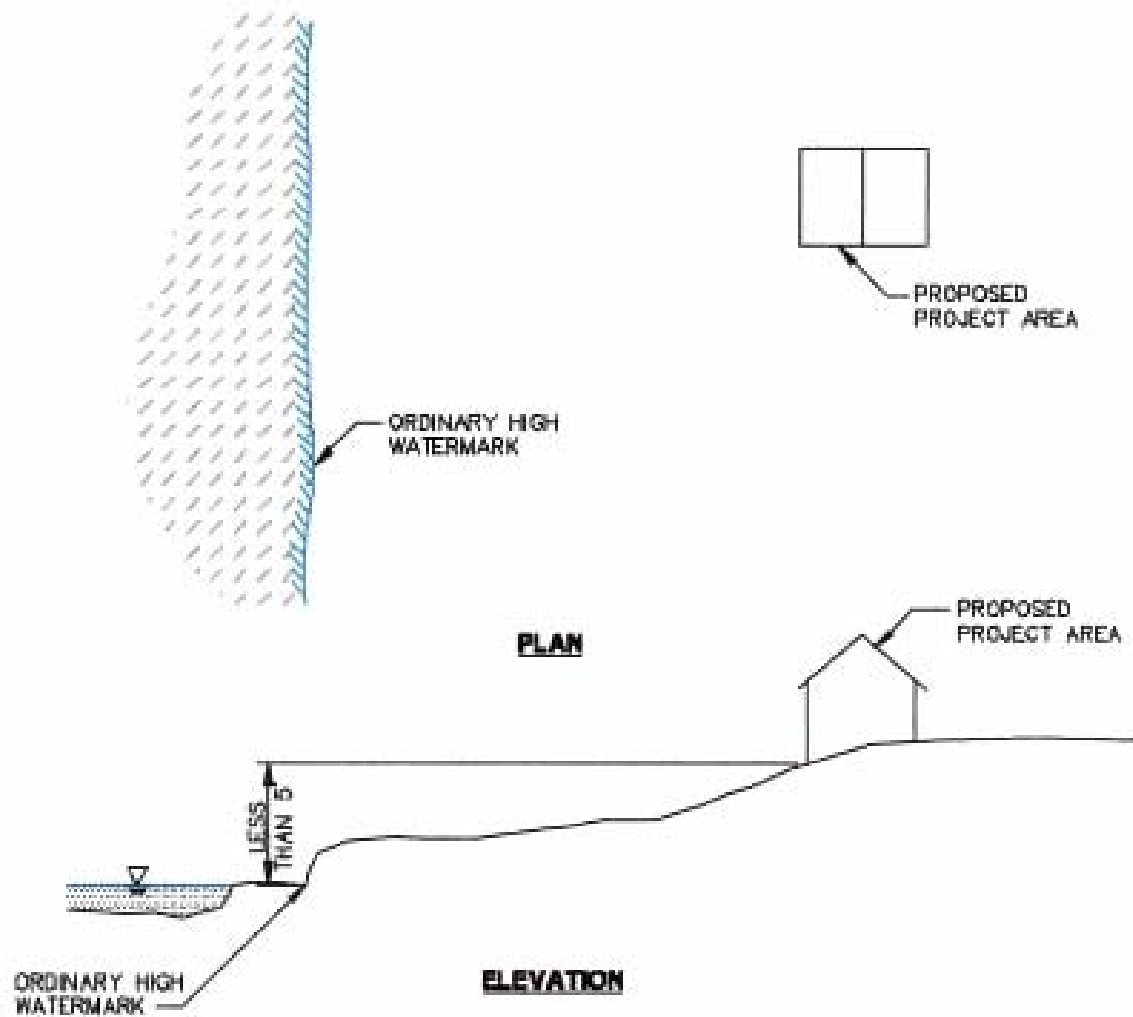
FIGURE 18D.70-1



**NOTE:** AS SHOWN ABOVE, AREAS LESS THAN 300' HORIZONTAL DISTANCE FROM THE MAPPED DELINEATION OF THE FEMA FLOOD ZONE ARE WITHIN THE POTENTIAL FLOOD HAZARD AREA.

**POTENTIAL FLOOD HAZARD AREAS**  
**UNSTUDIED AREAS**  
 N.T.S.

 <p><b>City of Tenino</b>          Community Development Department          149 S. Hodgden          Tenino, WA 98589 (360) 264-2368</p>	<p align="center"><b>POTENTIAL FLOOD HAZARD AREAS UNSTUDIED AREAS</b></p>		
<p><b>Copied By:</b> DOC</p>	<p><b>Adopted by:</b> Ord. No. 710</p>	<p><b>Effective Date:</b> May 2, 2005</p>	<p align="right"><b>FIGURE 18D.70-2</b></p>



**NOTE:** AS SHOWN ABOVE, AREAS LESS THAN 5' VERTICAL HEIGHT ABOVE THE ORDINARY HIGH WATER MARK OF AN IDENTIFIED NATURAL WATER ARE WITHIN THE POTENTIAL FLOOD HAZARD AREA.

## **POTENTIAL FLOOD HAZARD AREAS** **NATURAL WATERCOURSE**

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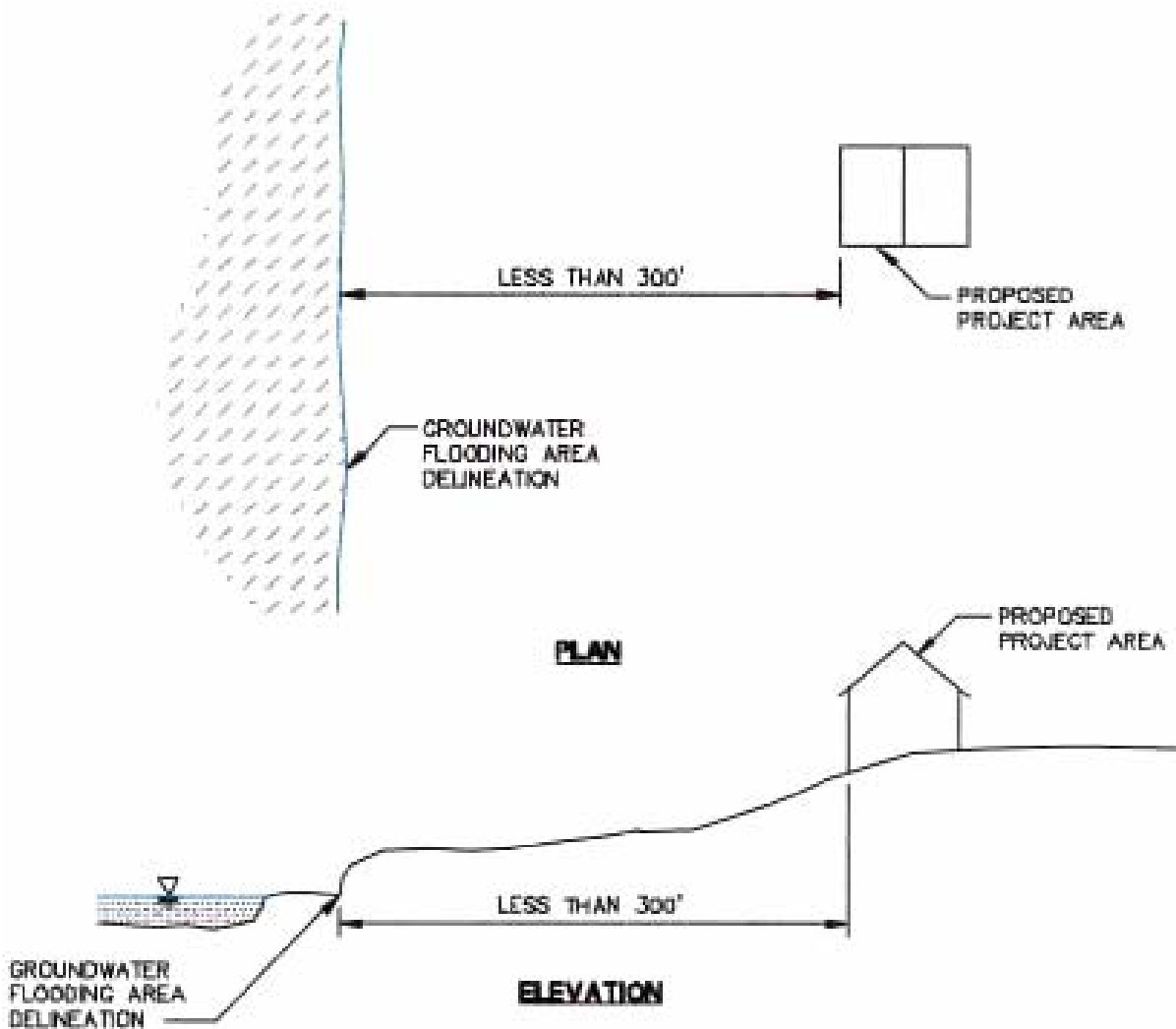
## **POTENTIAL FLOOD HAZARD AREAS NATURAL WATERCOURSE**

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FIGURE 18D.70-3



NOTE: AS SHOWN ABOVE, AREAS LESS THAN 300' HORIZONTAL DISTANCE FROM THE MAPPED DELINEATION OF A GROUNDWATER FLOODING AREA ARE WITHIN THE POTENTIAL FLOOD HAZARD AREA

## POTENTIAL FLOOD HAZARD AREAS GROUNDWATER FLOODING AREAS

N.T.S.



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## POTENTIAL FLOOD HAZARD AREAS GROUNDWATER FLOODING AREAS

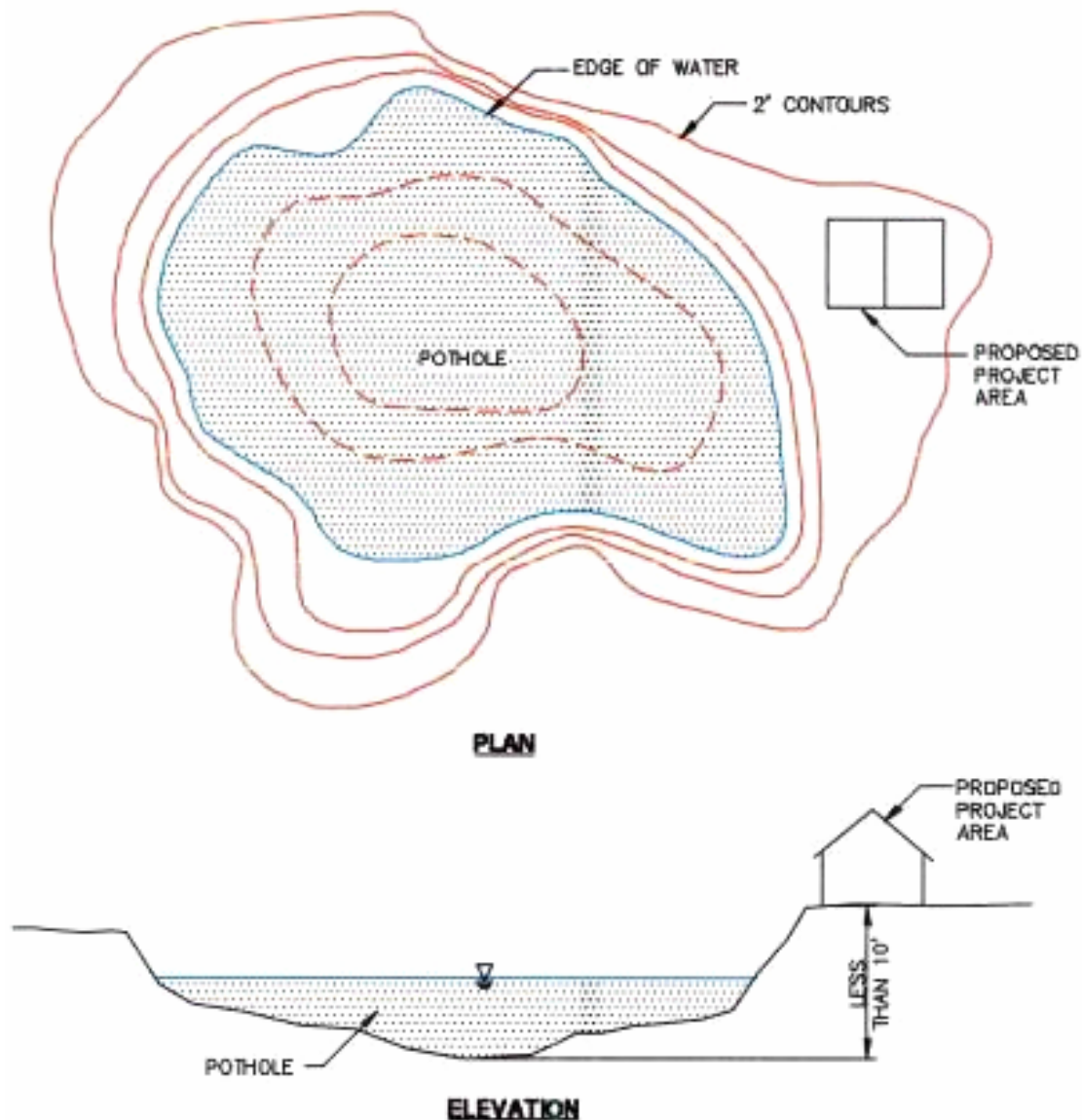
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**FIGURE**

**18D.70-4**



**NOTE:** AS SHOWN ABOVE, AREAS LOCATED WITHIN 10' OF VERTICAL HEIGHT FROM THE BOTTOM ELEVATION OF AN IDENTIFIED POTHOLE ARE WITHIN THE POTENTIAL FLOOD HAZARD AREA.

## POTENTIAL FLOOD HAZARD AREAS POTHOLES

N.T.S.



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## POTENTIAL FLOOD HAZARD AREAS POTHOLES

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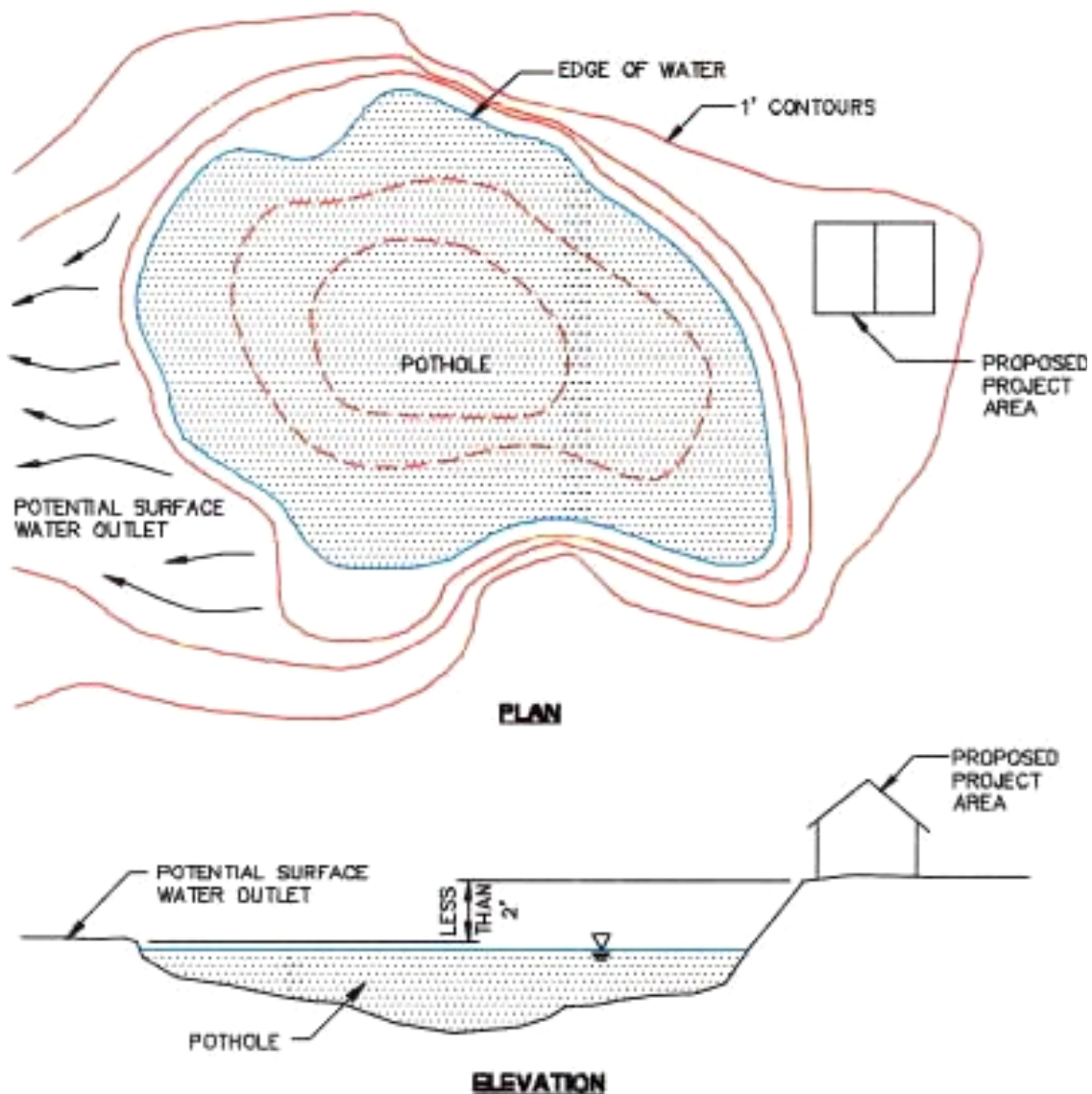
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FIGURE

18D.70-5





NOTE: AS SHOWN ABOVE, AREAS LOCATED WITHIN 2' OF VERTICAL HEIGHT OF A POTENTIAL SURFACE WATER SPILLWAY FROM THE POTHOLE ARE WITHIN THE POTENTIAL FLOOD HAZARD AREA

## POTENTIAL FLOOD HAZARD AREAS POTHoles

N.T.S.



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## POTENTIAL FLOOD HAZARD AREAS POTHoles

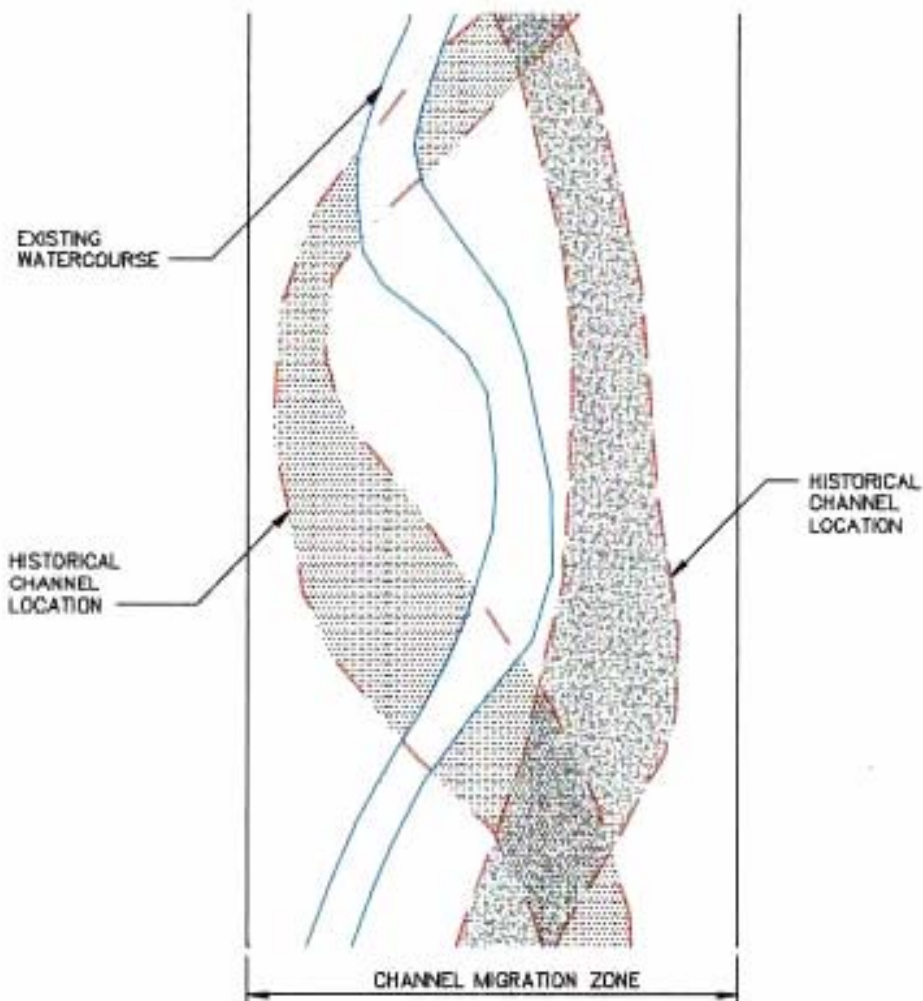
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FIGURE

18D.70-6



### **MAPPING OF ALL HISTORICAL CHANNELS**

NOTE: THE LOCATION OF MANY RIVER CHANNELS CHANGE OVER TIME. THE CHANNEL MIGRATION ZONE (CMZ) IS THAT AREA THAT CAN BE IDENTIFIED BY EVIDENCE OF PAST CHANNEL MOVEMENTS, INCLUDING THE PRESENT CHANNEL LOCATION. THE CMZ AREA IS CONSIDERED TO BE AT RISK FROM EROSION AND FLOODING, AND HAS SIMILAR TOPOGRAPHIC CHARACTERISTICS TO PRESENT AND HISTORIC STREAM CHANNELS.

### **POTENTIAL FLOOD HAZARD AREAS** **CHANNEL MIGRATION ZONE**

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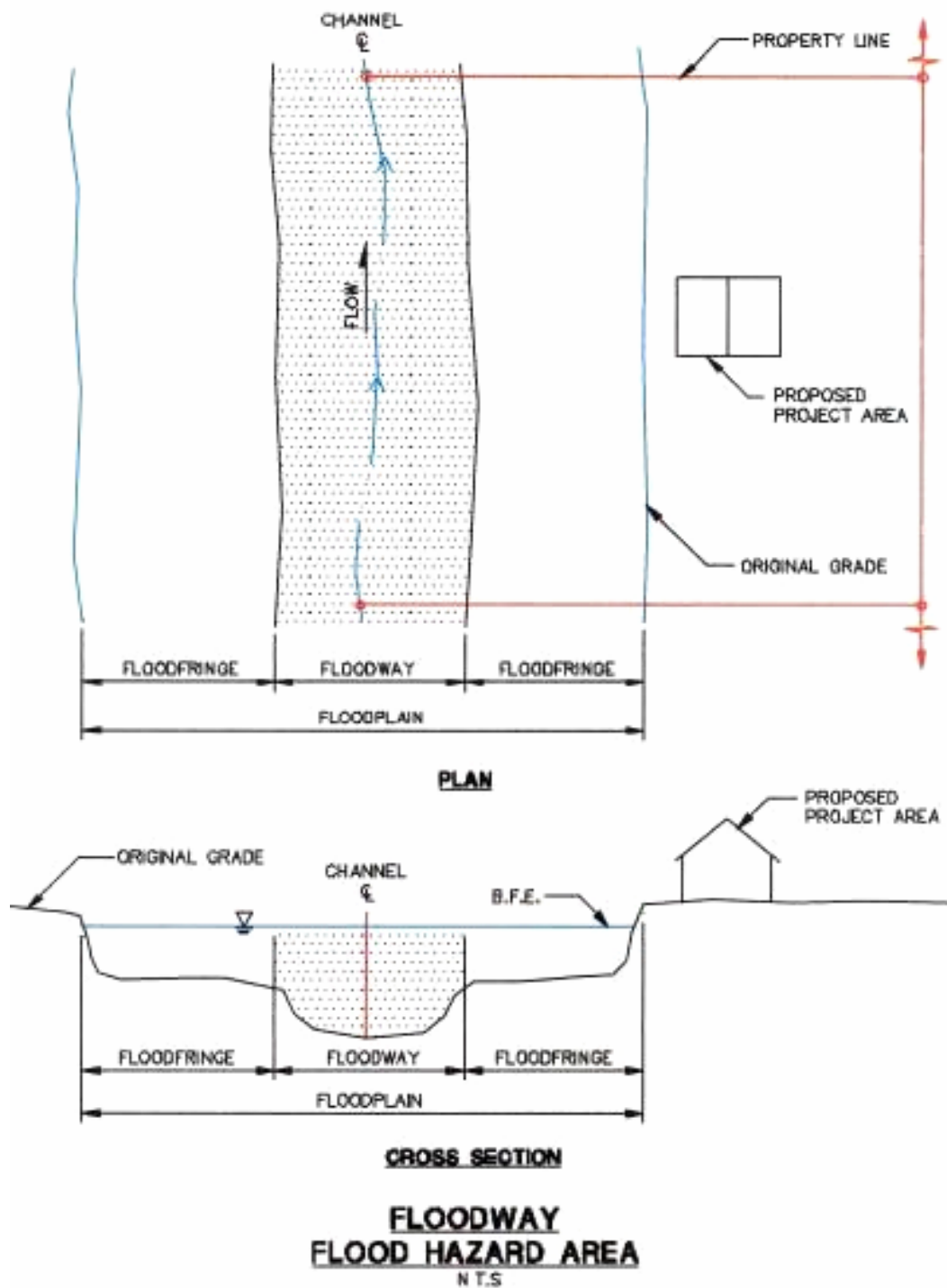
### **POTENTIAL FLOOD HAZARD AREAS CHANNEL MIGRATION ZONE**

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FIGURE 18D.70-7



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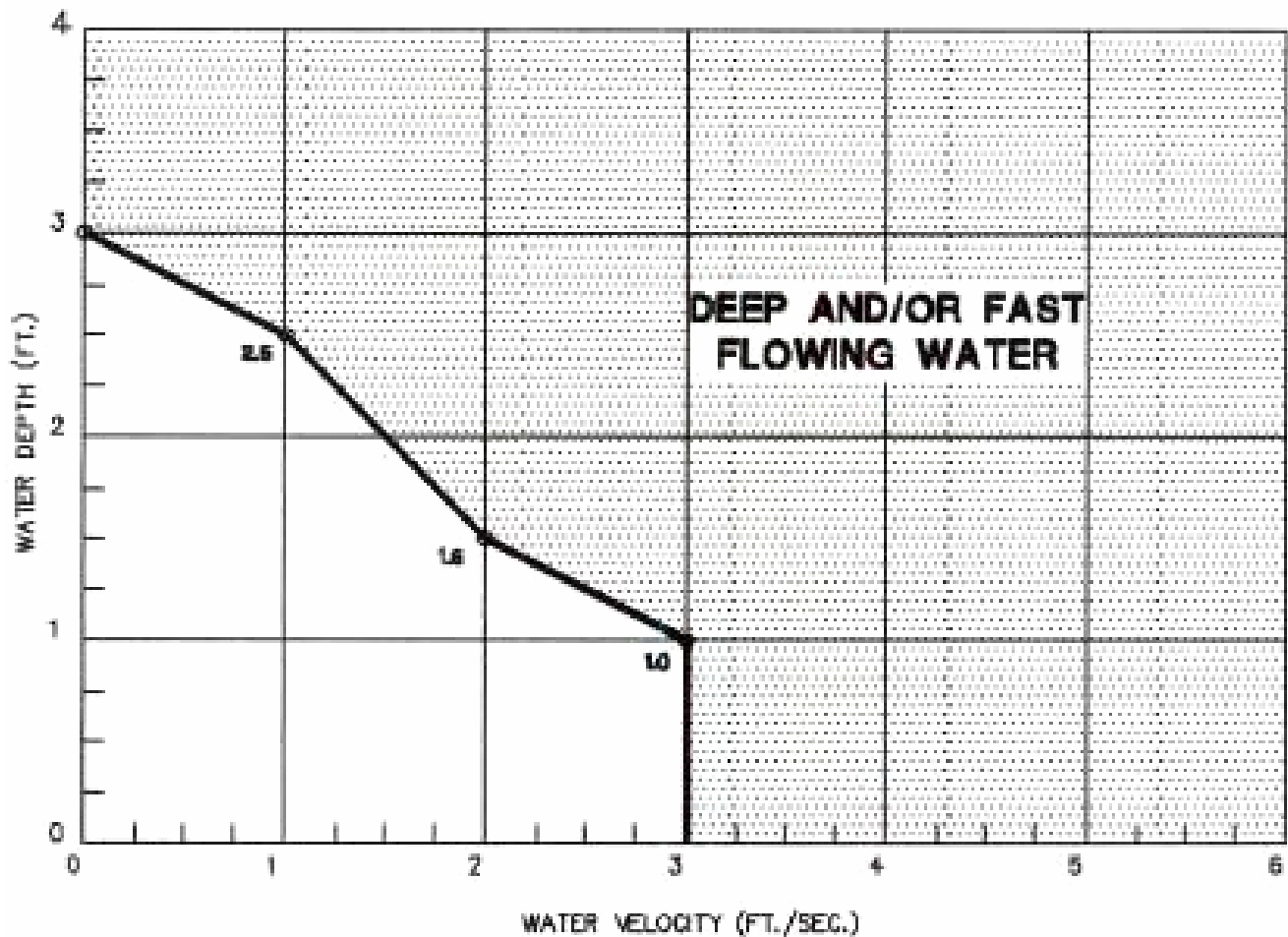
## FLOODWAY FLOOD HAZARD AREA

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FIGURE 18D.70-8



**DEEP AND/OR FAST FLOWING WATER GRAPH**



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**DEEP AND/OR FAST FLOWING WATER GRAPH**

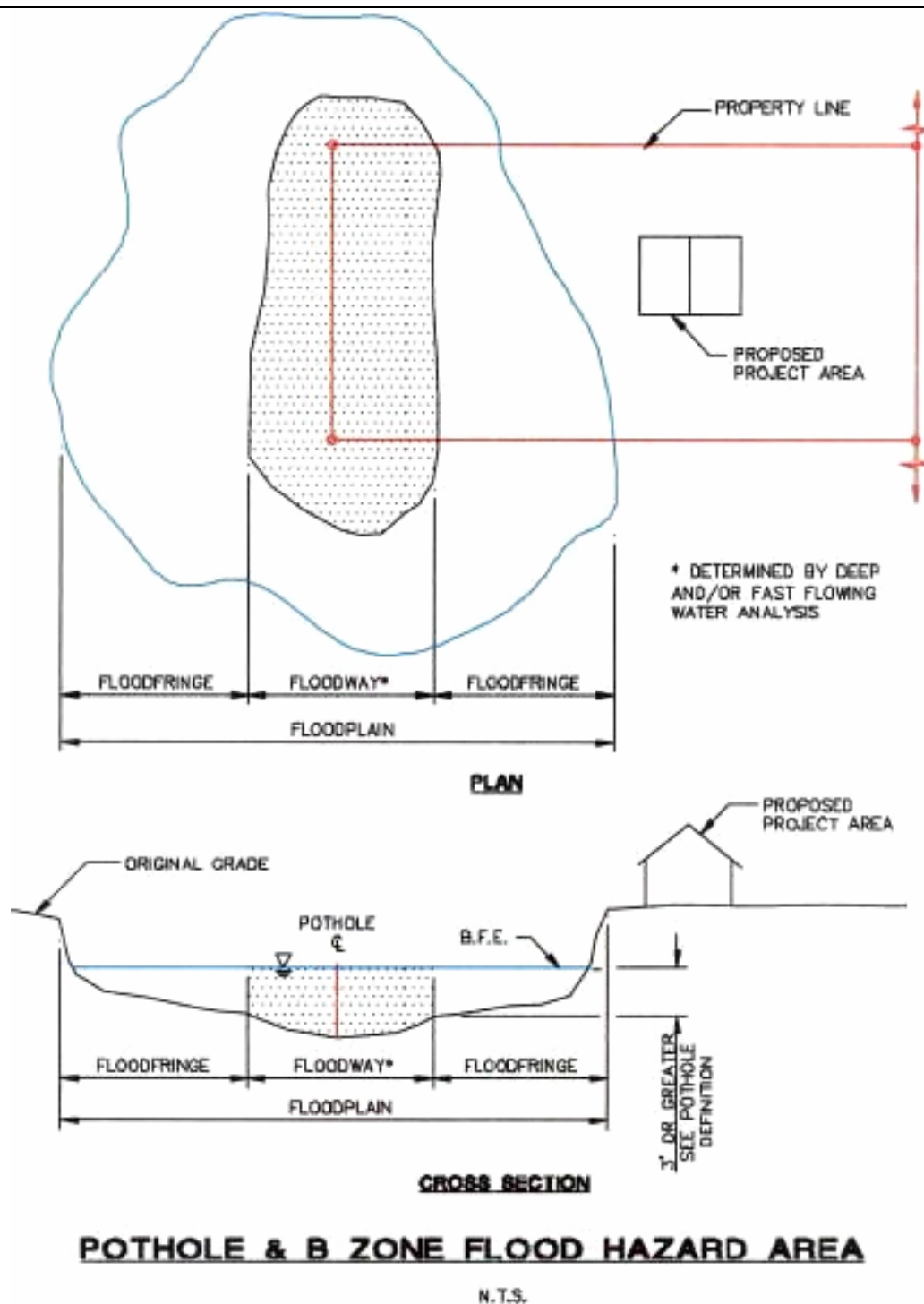
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FIGURE

18D.70-9



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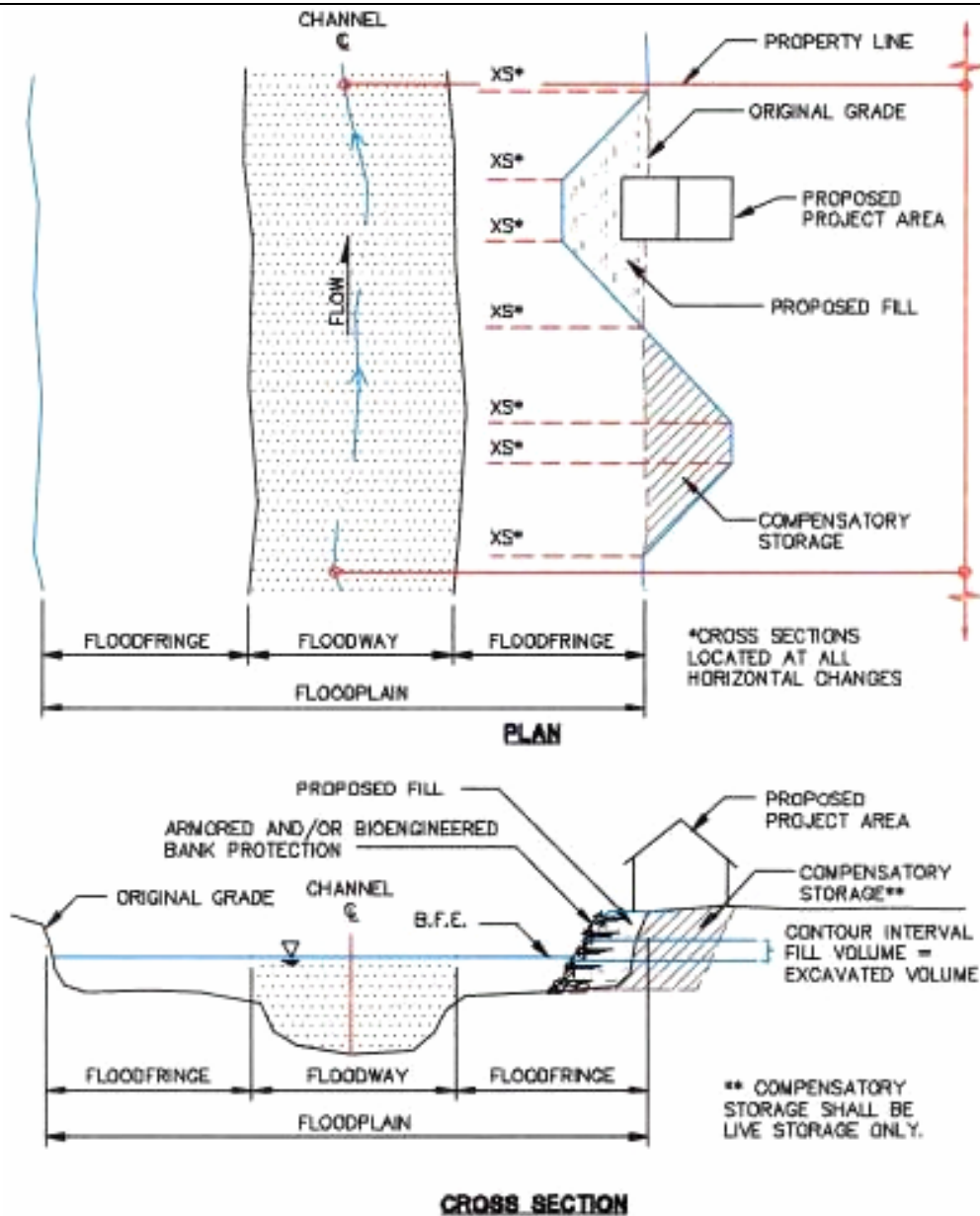
## POTHOLE & B ZONE FLOOD HAZARD AREA

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FIGURE 18D.70-10



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## COMPENSATORY STORAGE

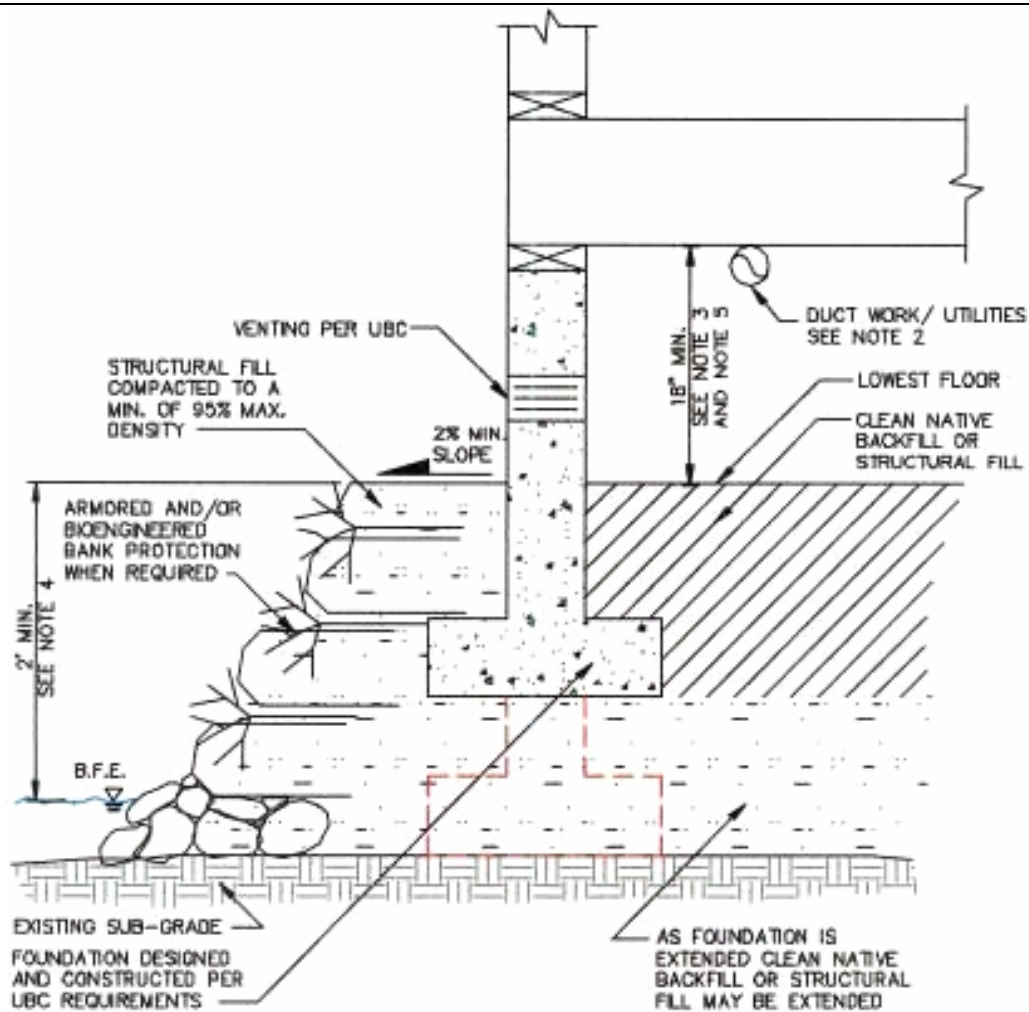
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FIGURE 18D.70-13





**NOTES:**

1. FILL MATERIAL SHALL MEET THE NO-RISE CRITERIA WITH SUPPORTING ANALYSIS
2. ALL BUILDING CONSTRUCTION MATERIALS (I.E. DUCT WORK, UTILITIES, SIDING, ETC.) SHALL HAVE 2' MIN VERTICAL SEPARATION FROM THE B.F.E.
3. APPLIES TO NON-PRESSURE TREATED FLOOR JOISTS.
4. VERTICAL SEPARATION SHALL BE 3' MIN. FOR CRITICAL FACILITIES.
5. LOWEST FLOOR ELEVATION WILL AFFECT FLOOD INSURANCE PREMIUMS.

**STRUCTURE WITH CRAWLSPACE  
ELEVATION BY FILL**

N.T.S



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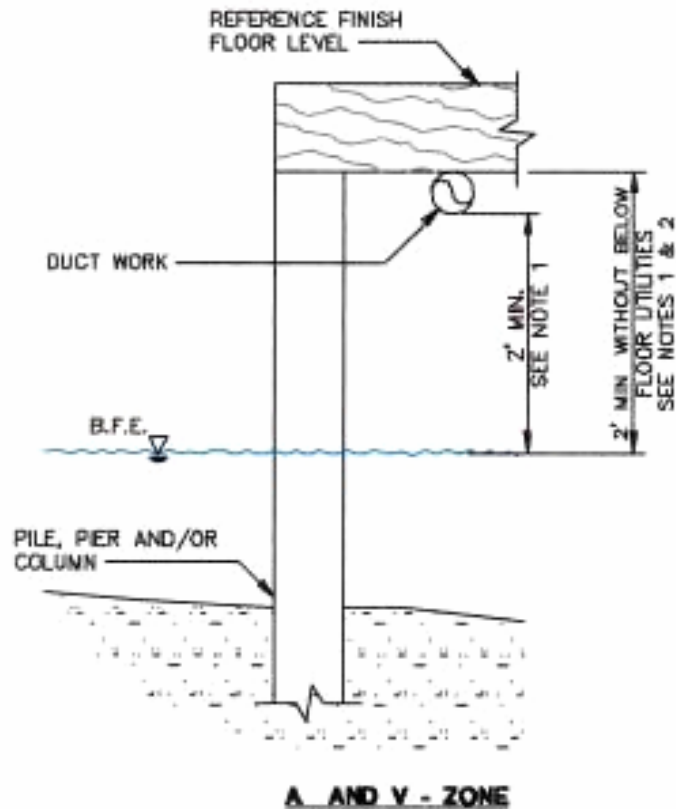
**STRUCTURE WITH CRAWLSPACE  
ELEVATION BY FILL**

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FIGURE 18D.70-18D



**NOTES:**

1. BOTTOM OF LOWEST HORIZONTAL STRUCTURAL MEMBER ELEVATION AND ALL BUILDING CONSTRUCTION MATERIALS (I.E. DUCT WORK, UTILITIES, SIDING, FLOOR JOISTS, ETC.) SHALL HAVE 2' MIN. VERTICAL SEPARATION FROM THE B.F.E.
2. BOTTOM OF LOWEST HORIZONTAL STRUCTURAL MEMBER SHALL HAVE 3' MIN. VERTICAL SEPARATION FROM THE B.F.E. FOR CRITICAL FACILITIES IN A AND V ZONES.

**BUILDING ON PILES, PIERS OR COLUMNS**

N.T.S.



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**BUILDING ON PILES, PIERS OR COLUMNS**

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FIGURE 18D.70-15



## Chapter 18D.80

### LANDSLIDE HAZARD AREAS

#### Sections:

- [18D.80.010](#) Purpose.
- [18D.80.020](#) Landslide Hazard Areas.
- [18D.80.030](#) Landslide Hazard Area Review Procedures.
- [18D.80.040](#) Landslide Hazard Area Standards.
- [18D.80.050](#) Buffer Requirements.
- [18D.80.060](#) Appendices.
  - A. Geological Assessment-Landslide Hazard Geotechnical Letter.
  - B. Geological Assessment-Landslide Hazard Geotechnical Verification.
  - C. Geological Assessment-Landslide Hazard Geotechnical Report.
- [18D.80.070](#) Figures.
  - Figure 18D.80-1 Landslide Hazard Indicators.
  - Figure 18D.80-2 Potential Landslide Hazard Areas.
  - Figure 18D.80-3 Potential Landslide Hazard Areas – Slopes Greater than 20%.
  - Figure 18D.80-4 Interim Areas Between Landslide Hazard Areas.
  - Figure 18D.80-5 Landslide Hazard Area Review.
  - Figure 18D.80-6 Required Buffers for Active Landslide Hazard Areas.

#### **18D.80.010 Purpose.**

The following statements describe the purpose of this Chapter is to:

- A. Protect human life and health.
- B. Regulate uses of land in order to avoid damage to structures and property being developed and damage to neighboring land and structures.
- C. Identify and map active landslide hazard areas.
- D. Minimize the ill effects on wetlands and critical fish and wildlife habitat that can result from landslides.
- E. Establish permit requirement and review procedures for development proposals in areas with potential landslides.

#### **18D.80.020 Landslide Hazard Areas.**

- A. **Landslide Hazard Areas Indicators.** Landslide hazard areas are areas potentially subject to mass movement due to a combination of geologic, seismic, topographic, hydrologic, or manmade factors. Landslide hazard areas can be identified by the presence of any of the following indicators:
  - 1. Areas of historic failures, including areas of unstable, old and recent landslides or landslide debris within a head scarp.
  - 2. Areas with active bluff retreat that exhibit continuing sloughing or calving of bluff sediments, resulting in a vertical or steep bluff face with little or no vegetation.
  - 3. Areas with both of the following characteristics:
    - a. Slopes steeper than 20 percent with a vertical relief of 20 feet or more; and
    - b. Hillsides that intersect geologic contacts with a relatively permeable sediment overlying a relatively impermeable sediment or bedrock.

4. Slopes parallel or sub-parallel to planes of weakness, such as bedding planes, joint systems, and fault planes in subsurface materials.
5. Areas exhibiting geomorphological features indicative of past slope failure, such as hummocky ground, back-rotated benches on slopes, etc.
6. Areas with tension cracks or ground fractures along and/or near the edge of the top of a bluff or ravine.
7. Areas with structures that exhibit structural damage such as settling and cracking of building foundations or separation of steps or porch from a main structure that is located near the edge of a bluff or ravine.
8. The occurrence of toppling, leaning, bowed, or jackstrawed trees that are caused by disruption of ground surface by active movement.
9. Areas with slopes containing soft or liquifiable soils.
10. Areas where gullying and surface erosion have caused dissection of the bluff edge or slope face as a result of drainage or discharge from pipes, culverts, ditches, and natural drainage courses.
11. Areas where seeps or springs or indicators (e.g., vegetation type) of a shallow groundwater table are observed on or adjacent to the face of the slope.
12. Any area with a slope of 40 percent or steeper and with a vertical relief of 15 or more feet, except those manmade slopes created under the design and inspection of a geotechnical professional or slopes composed of competent bedrock. For the purposes of determining whether a slope is considered to be a landslide hazard area, the horizontal and vertical distance between the top and toe of slope are utilized.
13. Areas that are at risk of mass movement due to seismic events.
14. Areas that include alluvial or colluvial fans located at the base of steep slopes and drainages.

**B. Potential Landslide Hazard Areas.** Potential landslide hazard areas (see [Figure 18D.80-2](#)), as depicted on the Critical Areas Atlas-Landslide Hazard Areas Map, are those areas where the suspected risk of slope instability and landslide is sufficient to require a geological assessment to assess the potential for active landslide activity. Potential landslide hazard areas are determined by using the following criteria:

1. Areas identified on the Coastal Zone Atlas of Washington, Volume 8, 1979 Thurston County as either U (unstable), Urs (unstable recent slide), Uos (unstable old slide), I (intermediate), or M (modified), and any adjacent areas within 300 feet.
2. Areas identified on City topographic maps as having slopes greater than 20 percent with a vertical relief of greater than 20 feet and any adjacent areas within a distance of 65 feet.
3. Areas that possess one or more of the landslide hazard area indicators (stratigraphy, groundwater conditions, etc.) as set forth in Section 18D.80.020 A and any adjacent area within a distance of 65 feet.
4. Areas not reflected on the Coastal Zone Atlas that have been determined to be active through a geological assessment process.
5. Areas identified on City topographic maps as having slopes greater than 50 percent with a vertical relief of greater than 100 feet and any adjacent areas within a distance of 300 feet.

**C. Landslide Hazard Area Categories.** Landslide hazard areas shall be classified into categories, which reflect each landslide hazard areas past landslide activity, and the potential

for future landslide activity based on an analysis of slope instability. Landslide hazard areas shall be designated as follows:

1. **Active Landslide Areas.** A composite of the active landslides and/or unstable areas, including that portion of the top of slope and slope face subject to failure and sliding as well as toe of slope areas subject to impact from down slope run-out, identified and mapped during a geological assessment of a site. An active landslide hazard area exhibits one or more of the following:
  - a. Areas of historical landslide movement on a site which have occurred in the past century including areas identified on the Coastal Zone Atlas of Washington, Volume 8, 1979 Thurston County, as Urs (unstable recent slide).
  - b. Unstable areas that exhibit geological and geomorphologic evidence of past slope instability or landsliding or possess geological indicators (stratigraphy, ground water conditions, etc.), as set forth in 18D.80.020 A, that have been determined through a geological assessment process to be presently failing or may be subject to future landslide activity. The impact of the proposed development activities must be considered in defining the extent of the active areas.
  - c. Interim areas are located between areas identified through the geological assessment process as an active landslide hazard area. Interim areas will be considered part of the active landslide hazard area if the required top of slope or toe of slope landslide hazard area (see 18D.80 Appendix D, and [Figure 18D.80-4](#)).
2. **Stable Areas.** Areas that have been identified as potential landslide hazard areas but through the geological assessment process, meet one of the following conditions:
  - a. No indicators as set forth in 18D.80.020 A actually exist that indicate the potential for future landslide activity to occur;
  - b. A slope stability analysis has proven that there is no landslide potential; or
  - c. Adequate engineering or structural measures have been provided in a geological assessment - geotechnical report that mitigates the potential for a future landslide to occur as a result of current or past development activity. The engineering or structural measures must provide a minimum factor of safety of 1.5 static conditions and 1.1 for dynamic conditions. Analysis of dynamic (seismic) conditions shall be based on a minimum horizontal acceleration as established by the current version of the City's adopted Building Code. The engineering or structural measures must be completed, inspected and accepted for the area to be deemed stable. Construction sequencing recommendations must be provided by the geotechnical professional when a proposed development will be constructed concurrently with the engineering or structural measures.
  - d. Areas that have been determined to be stable or are converted into a stable area by the implementation of engineering or structural measures are not considered a landslide hazard area or a critical area and are therefore also exempt from the provisions of TMC 18C - SEPA.
3. **Development Prohibited.** In areas meeting both of the following characteristics no structure or disturbance of vegetation is permitted:
  - a. An area with a slope of 100 percent or steeper (45 degrees); and
  - b. Hillsides intersecting geological contacts with relatively permeable sediment overlying a relatively impermeable sediment or bedrock.

### **18D.80.030 Landslide Hazard Area Review Procedures.**

#### **A. General Requirements.**

1. The City's Critical Area map provides an indication of where active and potential landslide hazard areas are located within the City. The actual presence or location of an active landslide hazard area and/or additional potential landslide hazard areas that have not been mapped, but may be present on or adjacent to a site, shall be determined using the geological assessment procedures established in this Chapter.
2. The Department will complete a review of the Critical Areas Atlas - Landslide Hazard Area Map and other source documents for any proposed regulated activity to determine whether the site is, or may be located within, an active or potential landslide hazard area. Identification of an active or potential landslide hazard area may also occur as a result of field investigations conducted by Department staff.
3. When the Department's maps or sources indicate that the site for a proposed regulated activity is or may be located within an active or potential landslide hazard area, the Department shall require the submittal of a geological assessment as outlined in 18D.80.030 B below (see [Figure 18D.80-5](#)).
4. Unless otherwise stated in this Chapter, the critical protective measure provisions contained in Section 18D.10.080 shall apply.

#### **B. Geological Assessment.** A geological assessment is a site investigation process to evaluate the on-site geology affecting a subject property.

1. Geological assessments shall be submitted to the Department for review and approval together with a landslide hazard area application and associated fee.
2. A geological assessment shall include a field investigation and may include the use of historical air photo analysis, review of public records and documentation, and interviews with adjacent property owners, etc.
3. The geological assessment shall include the following information and analysis:
  - a. A determination of which areas on the site or within the vicinity of the site meet the criteria for an active landslide hazard area and stable area as set forth in Section 18D.80.020 C1 and 2.
  - b. Consider the run-out hazard of landslide debris to the proposed development that starts upslope (whether part of the subject property or on a neighboring property) and/or the impacts of landslide run-out on down slope properties.
  - c. The geological assessment shall include a detailed review of the field investigations, published data and references, data and conclusions from past geological assessments, or geotechnical investigations of the site, site-specific measurements, tests, investigations, or studies, as well as the methods of data analysis and calculations that support the results, conclusions, and recommendations.
4. Geological assessments shall be prepared, signed, and dated by a geotechnical professional (as defined in Section 18D.10.060 and established in this Chapter) and the format shall be pre-approved by the Department.
5. An engineering geologist shall complete a field investigation and geological assessment to determine whether or not an active landslide hazard area exists within 300 feet of the site (see [Figure 18D.80-5](#)).
  - a. The geological assessment shall be submitted in the form of a *geotechnical letter* when the engineering geologist finds that no active landslide hazard area exists within 300 feet of the site. The geotechnical letter shall meet the requirements contained in 18D.80.060 Appendix A.

- b. The geological assessment shall be submitted in the form of *geotechnical verification* when the engineering geologist finds that an active landslide hazard area exists, but is located more than 300 feet away from the proposed project area. The geotechnical verification shall meet the requirements contained in 18D.80.060 Appendix B.
  - c. The geological assessment shall be submitted in the form of a *geotechnical report* when the engineering geologist finds that an active landslide hazard area exists within 300 feet of the proposed project area or when a geotechnical professional determines that mitigation measures are necessary in order to construct or develop within a potential landslide hazard area. The geotechnical report shall meet the requirements contained in 18D.80.060 Appendix C.
6. Geological assessments that do not contain the minimum required information or comply with the landslide hazard area standards set forth in 18D.80.030 will be returned to the geotechnical professional for revision.
  7. The Department shall review the geological assessment and either:
    - a. Accept the geological assessment; or
    - b. Reject the geological assessment and require revisions or additional information.
  8. When the geological assessment has been accepted, the Department shall issue a decision on the landslide hazard area application.
  9. A geological assessment for a specific site may be valid for a period of up to five years when the proposed land use activity and surrounding site conditions are unchanged. However, if any environmental conditions associated with the site change during that five-year period, the applicant may be required to submit an amendment to the geological assessment.

#### **18D.80.040 Landslide and Erosion Hazard Area Standards.**

- A. **Active Landslide Hazard Areas.** Any development, encroachment, filling, clearing or grading, building structures, impervious surfaces, and vegetation removal shall be prohibited within active landslide hazard areas and associated buffers except as specified in the following standards:
  1. **Stormwater Conveyance.** Stormwater conveyance shall be allowed when it is conveyed through a high-density polyethylene stormwater pipe with fuse-welded joints and when no other stormwater conveyance alternative is available. The pipe shall be located on the surface of the ground and be properly anchored so that it will continue to function in the event of an underlying slide.
  2. **Utility Lines.** Utility lines will be permitted when no other conveyance alternative is available. The line shall be located above ground and properly anchored and/or designed so that it will continue to function in the event of an underlying slide.
  3. **Roads, Bridges, and Trails.** Roads, bridges, and trails shall be allowed when all of the following conditions have been met:
    - a. Mitigation measures are provided that ensure the roadway prism and/or bridge structure will not be susceptible to damage from landslide-induced ground deformation or impact/coverage by landslide debris. Mitigation measures shall be designed for static and seismic loading conditions in accordance with the most recent version of the American Association of State Highway and Transportation Officials ([AASHTO](#)) Manual.
    - b. The road is not a sole access for a development.
    - c. The removal or disturbance of vegetation, clearing or grading shall be prohibited during the wet season (November 1st to May 1st).

- B. Landslide Hazard Management Areas.** All regulated activities may be allowed in areas located within 300 feet of an active landslide hazard area subject to the following standards:
1. The Department reviews and approves a geological assessment - geotechnical report and determines that the potential landslide hazard area is stable.
  2. The proposed development is located outside of an active landslide hazard area and any required buffer, as set forth in 18D.80.050.
  3. The proposed recommendations and mitigation measures contained within the geotechnical report are adequate to reduce or mitigate risks to health and safety.
  4. The proposed development shall not decrease the factor of safety for landslide occurrence below the limits of 1.5 for static conditions and 1.2 for dynamic conditions. Analysis of dynamic (seismic) conditions shall be based on a minimum horizontal acceleration as established by the current version of the adopted Washington State Building Code.
  5. The removal and disturbance of vegetation, clearing or grading shall be limited to the area of the approved development and shall not be allowed during the wet season (November 1st through May 1st) unless adequate provisions for wet season erosion have been addressed in the geotechnical report and approved by the Department.
  6. Surface drainage from developed areas, including downspouts and runoff from paved or unpaved surfaces up slope, shall not be directed through an active landslide hazard area or its associated buffer unless it is conveyed in conformance with the provisions in 18D.80.030 A1 above.
  7. Stormwater retention facilities, including infiltration systems utilizing perforated pipe, are prohibited unless the slope stability impacts of such systems have been analyzed and mitigated by a geotechnical professional and the impacts have been determined to be negligible.
  8. The proposed development shall not create a need for larger landslide hazard area buffers and setbacks on neighboring properties unless approved through a notarized written agreement with the affected property owner(s).
  9. The proposed development shall be sited far enough from regressing slope faces to project 120 years of useful life for the proposed structure(s) or infrastructure.
  10. Any proposed lots must be completely located outside any identified active landslide hazard areas or their associated buffers.
  11. Stable landslide hazard areas that are directly adjacent to any riparian areas, or wetlands, may be subject to additional buffer requirements and standards as set forth in Chapter 18D.60 Critical Fish and Wildlife Habitat Areas or wetlands as set forth in Chapter 18D.30 Wetlands.

#### **18D.80.050 Buffer Requirements.**

**A. Determining Buffer Widths.**

1. The buffer width shall be measured on a horizontal plane from a perpendicular line established at the edge of the active landslide hazard area limits (both from the top and toe of the slope) (see 18D.80 Appendix D, and [Figure 18D.80-6](#)).
2. A buffer of undisturbed vegetation shall be required for an active landslide hazard area. The required buffer width is the greater amount of the following distances:
  - a. Fifty feet from all edges of the active landslide hazard area limits;
  - b. A distance of one-third the height of the slope at the top of the active landslide hazard area and a distance of one-half the height of the slope at the bottom of an active landslide hazard area; or



- c. The minimum distance recommended by the geotechnical professional, measured from the edges of the active landslide hazard area.
- B. **Modification of Buffer Widths.** The Department may require a larger buffer width than the buffer distance, as determined in A. above, if any of the following are identified:
  - 1. The adjacent land is susceptible to severe erosion and erosion control measures will not effectively prevent adverse impacts.
  - 2. The area has a severe risk of slope failure or downslope stormwater drainage impacts.

**18D.80.060 Appendices.**

- A. [Geological Assessment-Landslide Hazard Geotechnical Letter.](#)
- B. [Geological Assessment-Landslide Hazard Geotechnical Verification.](#)
- C. [Geological Assessment-Landslide Hazard Geotechnical Report.](#)

**18D.80.070 Figures.**

- Figure 18D.80-1 [Landslide Hazard Indicators.](#)
- Figure 18D.80-2 [Potential Landslide Hazard Areas.](#)
- Figure 18D.80-3 [Potential Landslide Hazard Areas – Slopes Greater than 20%.](#)
- Figure 18D.80-4 [Interim Areas Between Landslide Hazard Areas.](#)
- Figure 18D.80-5 [Landslide Hazard Area Review.](#)
- Figure 18D.80-6 [Required Buffers for Active Landslide Hazard Areas.](#)

## **18D.80.060 Appendices.**

### **APPENDIX A**

#### **GEOLOGICAL ASSESSMENT- LANDSLIDE HAZARD GEOTECHNICAL LETTER**

- A. A geotechnical letter shall include:
  - 1. The letter shall be labeled identifying the submittal as a “Landslide Hazard Geotechnical Letter.”
  - 2. The date when the geological assessment was performed and the date the letter was prepared.
  - 3. The parcel number(s) of the site.
  - 4. Site address, if the City has assigned one.
  - 5. A brief description of the project (including the proposed land use) and a description of the area to be developed. The appropriate professional preparing the Geotechnical Letter shall provide conclusions and recommendations as to slope stability for the proposed development.
  - 6. A paragraph that states the following specific language:

“I meet the qualifications contained in Section 18D.10.060 to prepare a landslide hazard geological assessment. I understand the requirements of the current Landslide Hazard Area Chapter 18D.80 and the definitions of the applicable terms contained within Chapter 18D.25 and Title 18D. I have performed a landslide hazard geological assessment, conducted a field investigation, and researched historic records on or in the vicinity of the above referenced site and determined that no active landslide hazard area exists within 300 feet of the site.”
  - 7. The name, mailing address, and telephone number of the engineering geologist who performed the geological assessment and prepared the letter.
  - 8. The name, mailing address, and telephone number of the property owner.
- B. The engineering geologist who prepared the letter shall stamp the letter with his or her license stamp/seal.
- C. Hold harmless clauses, disclaimers, and limitations are not allowed within a geotechnical letter.
- D. Geotechnical letters shall be in conformance with a format that is pre-approved by the Department.



## **18D.80.060 Appendices.**

### **APPENDIX B**

#### **GEOLOGICAL ASSESSMENT- LANDSLIDE HAZARD GEOTECHNICAL VERIFICATION**

- A. A geotechnical verification shall include:
1. The first page of the document shall be labeled identifying the submittal as a "Landslide Hazard Geotechnical Verification."
  2. The date when the geological assessment was performed. The date the verification document was prepared.
  3. The parcel number(s) of the site.
  4. Site address, if the City has assigned one.
  5. A detailed description of the project (including the proposed land use) and a description of the area to be developed.
  6. A description of the surface and subsurface geology, hydrology, soils, and vegetation at the site and a list of the landslide hazard area indicators, as set forth in Section 18D.80.020 A, that were found on or in the vicinity of the site.
  7. A summary of the results, conclusions, and recommendations resulting from the geological assessment of the landslide hazards on or in the vicinity of the site. This summary shall address all of the information required in Section 18D.80.030 B.
  8. An accurate site plan drawn at a scale of 1" = 20', 1" = 30', 1" = 50' (or other scale deemed appropriate by the Department) is required. The Department may require that the site plan information listed below be based on a field survey by a licensed surveyor. The site plan shall include:
    - a. The limits/location of the active landslide hazard area(s) set forth in Section 18D.80.020C1.
    - b. The limits/location of the required landslide hazard buffer based upon the requirements set forth in Section 18D.80.050 A.
    - c. The location of any existing and proposed structures, utilities, on-site septic systems, wells, and stormwater management facilities.
    - d. The full geographical limits of the proposed project area (area to be developed).
    - e. Dimension the closest distance between the identified active landslide hazard area boundary and the project area.
    - f. Existing topography on the site presented in two-foot contours.
    - g. Property lines for the site.
    - h. North arrow and plan scale.
  9. A paragraph that states the following specific language:

"I meet the qualifications contained in Section 18D.80.030 to prepare a landslide hazard geological assessment. I understand the requirements of the current Landslide Hazard Area Chapter 18D.80 and the definitions of the applicable terms contained within Chapter 18D.25 and Title 18D. I have performed a landslide hazard geological assessment, conducted a field investigation, and researched historic records on or in the vicinity of the above referenced site and determined that no active landslide hazard area exists within 300 feet of the proposed project area."

10. The name, mailing address, and telephone number of engineering geologist who performed the geological assessment and prepared the verification document.
  11. The name, mailing address, and telephone number of the property owner.
- B. The engineering geologist who prepared the verification document shall stamp the verification with his or her license stamp/seal.
  - C. Hold harmless clauses, disclaimers, and limitations are not allowed within geotechnical verification.
  - D. Geotechnical verifications shall be in conformance with a format that is pre-approved by the Department.

## 18D.80.060 Appendices.

### APPENDIX C

#### **GEOLOGICAL ASSESSMENT- LANDSLIDE HAZARD GEOTECHNICAL REPORT**

- A. At a minimum, a geotechnical report shall include the following:
1. The first page of the document shall clearly identify the submittal as a "Landslide Hazard Geotechnical Report."
  2. The date when the geological assessment was performed. The date the geotechnical report was prepared.
  3. The parcel number(s) of the site.
  4. Site address if the City has assigned one.
  5. A detailed description of the project (including the proposed land use) and a description of the area to be developed.
  6. A description of the surface and subsurface geology, hydrology, soils, and vegetation of the site and a list of the landslide hazard area indicators, as set forth in Section 18D.80.020 A, that were found on or in the vicinity of the site.
  7. A summary of the results, conclusions, and recommendations resulting from the geological assessment of the landslide hazards on or in the vicinity of the site. This summary shall address all of the information required in Section 18D.80.030 B.
  8. An accurate site plan drawn at a scale of 1" = 20', 1" = 30', 1" = 50' (or other scale deemed appropriate by the Department) is required. The Department may require that the site plan information listed below be based on a field survey by a licensed surveyor. The site plan shall include:
    - a. The limits/location of the active landslide hazard area(s) set forth in Section 18D.80.020C.1. Delineation of the active landslide hazard area limits shall differentiate between areas of historic landslide activity and adjacent unstable areas.
    - b. The limits/location of the required landslide hazard buffer based upon the requirements set forth in Section 18D.80.050 A.
    - c. The limits/location of any potential landslide hazard areas that have been designated as stable areas in accordance with Section 18D.80.020C2c.
    - d. The location of any existing and proposed structures, utilities, on-site septic systems, wells, and stormwater management facilities.
    - e. The full geographical limits of the proposed project area (area to be developed).
    - f. Location and unique identifier of geotechnical borings, [Cone Penetration Test](#) CPT Soundings or other surveys or explorations used to characterize subsurface conditions.
    - g. Extent of cross-section(s) used to evaluate the three-dimensional subsurface geologic and groundwater conditions at the site.
    - h. Extent of cross-section(s) used in the evaluation of slope instability.
    - i. Existing topography on the site presented in two-foot contours.
    - j. Property lines for the site.
    - k. North arrow and plan scale.
  9. Subsurface characterization data must be provided. The data shall be based on both existing and new information that may include soil borings, test pits, geophysical surveys, or other appropriate subsurface exploration methods, development of site-

specific soil and/or rock stratigraphy, and measurement of groundwater levels including variability resulting from seasonal changes, alterations to the site, etc.

a. Conventional geotechnical boring data shall be reported as a graphic log utilizing the following standards:

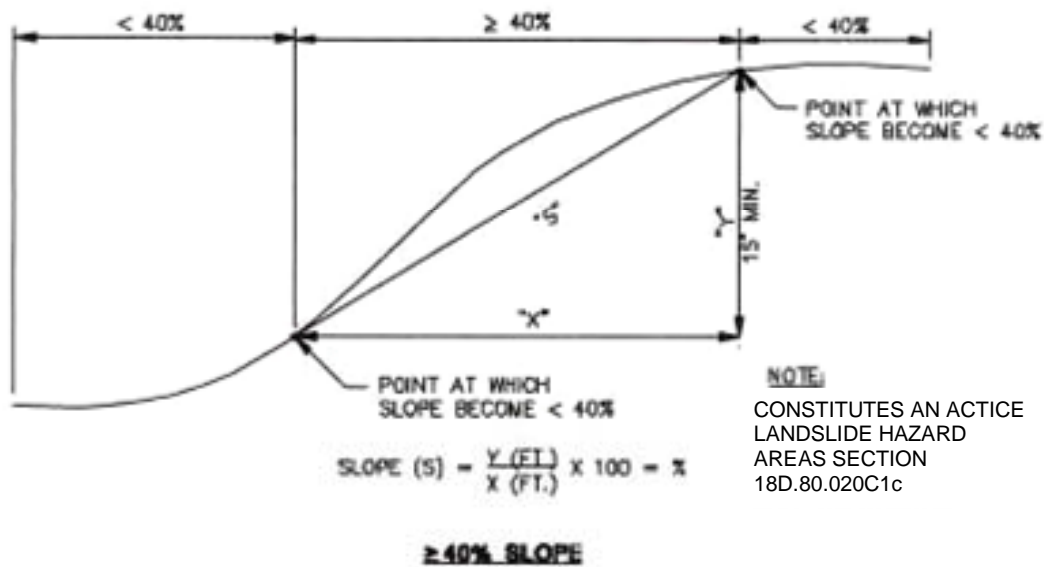
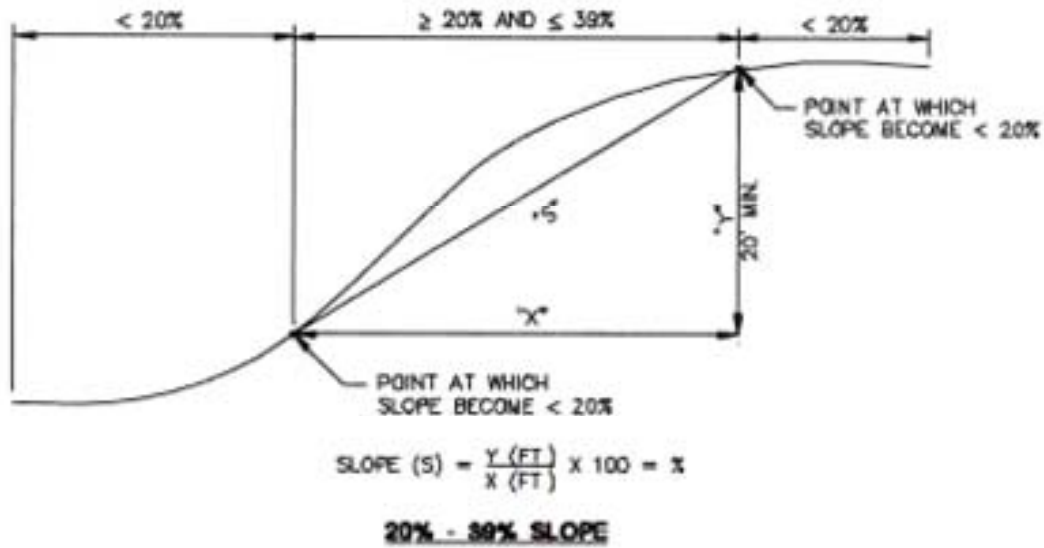
- (1) The vertical scale of the graphic log shall be such that 5 feet of drilled depth is scaled to range of 1" to 2" (1:60- or 1:30-scale), and shall include vertical columns that record depth in 1 ft. increments, [Standard Penetration Test](#) (SPT) value and incremental blow counts, a graphic pattern representation of the soil type encountered during drilling, and sample descriptions and other comments regarding drilling.
- (2) The graphic log shall have a header on the first page that includes a unique identifier for the boring, the times and dates of the start and completion of drilling, the manufacturer and model of the drilling rig, the company name of the drilling contractor, the name(s) of the site geologist(s) or engineer(s) overseeing the drilling activities, the details of the method used to advance the borehole (e.g., 4" i.d. hollow-stem auger), the type of drilling fluid used to stabilize the borehole, verification that the SPT followed all applicable ASTM standards including a description of the sampler, hammer weight, drop height, the type of hammer used to perform the SPT, number of turns of rope if a cathead is used to raise the hammer, condition of rope (i.e., new, used, frayed, oily, etc.), and the depth of static groundwater measured immediately prior to abandonment of the boring and the time and date of this measurement.
- (3) All subsequent pages of the graphic log shall have the unique identifier for the boring, the times and dates of the start and completion of drilling, and the number of the page and the total number of pages comprising the log.
- (4) Each SPT value will be reported in the appropriate column showing the blow counts recorded at each 6" interval, and the sum of the blow counts between penetration distances of 6" to 18", unless refusal conditions (50 or more blows with less than 6" of sampler penetration) are met anywhere in this interval. At refusal, the blow count shall be recorded as the number of blows with the corresponding sampler penetration, in inches.
- (5) SPT tests shall be performed every 5 feet during drilling, at a minimum. Additional undisturbed samples, collected following ASTM standards for undisturbed soil sampling, cannot be substituted for SPT testing.
- (6) The soil sample descriptions will include the total length of the recovered sample, the soil color, odor, the density or consistency (loose to very dense, very soft to very stiff), degree of water saturation (dry, moist, wet, saturated), and dilatancy. For granular (sand and gravel) soils, the description shall include a physical description of the soil sample, including size distribution (poorly or well graded), angularity, composition, amount and plasticity of the fines fraction. For fine soils (silt and clay), the description shall include a qualitative estimate of the proportion of the silt and clay size particles (e.g., silty clay, clay with some silt, etc.), plasticity, and amount and type of organic material. The sample description shall include a description of any bedding, laminations, slickensides, or other textural or deposition features, including contact between dissimilar soil types. The sample description shall also include a field classification of the soil sample using the Unified Soil Classification System where the classification is expressed in lower case letters (e.g., sp, ml, etc.). The

sample classification shall be expressed in upper case letters (e.g., SP, ML, etc.) where subsequent laboratory testing has been performed. This column of the graphic log will also include any other information relevant to the subsurface investigation, such as loss of drilling fluid, heaving, churning of the drill in gravelly soils, etc.

- b. CPT sounding data shall be reported as a graphic log utilizing the following standards:
    - (1) The vertical scale of the graphic log shall be such that 5 feet of penetrated depth is scaled to range of 1" to 2" (1:60- or 1:30-scale), and shall include vertical columns that record depth in 1 foot increments.
    - (2) The graphic log shall have a header on the first page that includes a unique identifier for the boring, the times and dates of the start and completion of the CPT sounding, the manufacturer and model of the CPT system, the company name of the CPT service contractor, the name(s) of the site geologist(s) or engineer(s) overseeing the CPT sounding, and any comments regarding the conduct of the testing, reaction of the CPT system during sounding, etc.
    - (3) All subsequent pages of the graphic log shall have the unique identifier for the boring, the times and dates of the start and completion of drilling, and the number of the page and the total number of pages comprising the log.
    - (4) The graphic log shall display, at a minimum, a continuous depth plot of the uncorrected tip resistance, the friction (sleeve) resistance, the friction ratio, and the measured pore pressure with an overlay of the calculated hydrostatic pore pressure. These curves shall be plotted so as to show the full variation of the measured quantities within the depth range of the sounding, and each curve shall have a visible scale with the minimum and maximum ranges labeled.
    - (5) All of the CPT data recorded for each sounding shall also be provided in either electronic or hardcopy format. Electronic data will be presented in an ASCII text file format.
  - c. Geotechnical borings or CPT soundings will be advanced to a depth sufficient to characterize geologic conditions within and below the existing or potential landslide mass.
  - d. Other methods used for subsurface characterization shall be assigned a unique identifier, and the basic data presented in appropriate graphical and/or tabular format.
  - e. The three-dimensional subsurface conditions at the site shall be presented using one or more cross-sections showing location and depth penetration of geotechnical borings, CPT soundings, or other subsurface characterization methods, interpretation of the geometry of major soil units, and projected location of the static groundwater surface determined from the subsurface exploration. The cross-sections shall be presented at a scale of 1" = 20', 1" = 30', 1" = 50' (or other scale deemed appropriate by the Department). Each cross-section shall have a legend with a description of the various major soil units.
10. Soil strength and index properties (i.e., unit weight, cohesion, etc.) shall be provided for each soil unit interpreted from the subsurface characterization of the site, and shall be presented in tabular format. Justification for the presented values of these soil parameters shall be based on one or more of the following approaches:
- a. Back analysis based on pre-landslide stability conditions.
  - b. Laboratory measurement of strength or other index properties made on soil samples.

- c. Correlation of soil strength index properties to other geotechnical indices (e.g., SPT blow counts, etc.), where the correlation relations are documented (e.g., published literatures, in-house empirical data set, etc.).
  - d. Soil strength and indices based on generic values must provide a clear justification for their use.
11. A detailed description of any prior grading activity, soil instability, or slope failure.
  12. Assessments and conclusions regarding slope stability for both the existing and developed conditions shall be presented and documented. These assessments and conclusions shall include:
    - a. Determination of the potential types of landslide failure mechanisms (e.g., debris flow, rotational slump, translational slip, etc.) that may affect the site.
    - b. Quantitative stability evaluation of slope conditions of the various failure mechanisms using state-of-the-practice modeling techniques. Limiting equilibrium methods of analysis shall state the stability conditions as a factor of safety. The most unstable failure geometry(ies) shall be presented in the form of a cross-section(s), with the least stable failure geometry for each failure mechanism clearly indicated. The stability evaluation shall also consider dynamic (earthquake) loading, and shall use a minimum horizontal acceleration as established by the current version of the Washington State Uniform Building Code.
    - c. An analysis of slope regression rate shall be presented in those cases where stability is impacted or influenced by erosional processes (e.g., wave cutting, stream meandering, etc.) acting on the toe of the slope.
  13. Mitigation recommendations using engineered measures to protect the proposed structure(s) and any adjacent structures, infrastructure, adjacent wetlands, or critical fish and wildlife habitat from damage or destruction as a result of proposed construction activities shall be designed by a professional engineer. The geotechnical report shall contain:
    - a. Design plans and associated design calculations for engineered structures or drainage systems (e.g., structural foundation requirements, retaining wall design, etc.).
    - b. Recommendations and requirements pertaining to the handling of surface and subsurface runoff in the developed condition.
    - c. Identification of necessary geotechnical inspections to assure conformance with the report mitigation and recommendations.
    - d. Proposed angles of cut and fill slopes, site grading requirements, final site topography (shown as 2' contours), and the location of any proposed structures, on-site septic systems, wells, and stormwater management features or facilities associated with the development detailed within the body of the report and shown on a site map at the same scale as that required in Section A-7 of this Appendix.
    - e. Soil compaction criteria and compaction inspection requirements.
    - f. An analysis that indicates how the proposal meets the standards outlined in Section 18D.80.040.
    - g. Structural foundation requirements and estimated foundation settlement shall be provided if structures are proposed.
    - h. Lateral earth pressures.
    - i. Suitability of onsite soil for use as fill.
    - j. Mitigation measures for building construction on each lot for short plats, large lots, or formal plats such that additional geotechnical professional involvement is minimized during building construction.

- B. The geotechnical report shall be prepared by an engineering geologist and shall be co-written by both an engineering geologist and professional engineer where both geological interpretations and engineering analyses and designs are necessary or prudent in the mitigation of the landslide hazard.
- C. The geotechnical professional(s) who prepared the geotechnical report shall stamp the report with his or her license stamp/seal.
- D. The Department may request a geotechnical professional to provide additional information in the geotechnical report based upon existing conditions, changed conditions, or unique circumstances occurring on a case by case basis.
- E. Hold harmless clauses, disclaimers, and limitations are not allowed to be included, neither expressly nor implied, within a geological assessment.
- F. Geotechnical reports shall be in conformance with a format that is pre-approved by the Department.



## LANDSLIDE HAZARD INDICATORS

NTS



**City of Tenino**  
 Community Development Department  
 149 S. Hodgden  
 Tenino, WA 98589 (360) 264-2368

## LANDSLIDE HAZARD INDICATORS

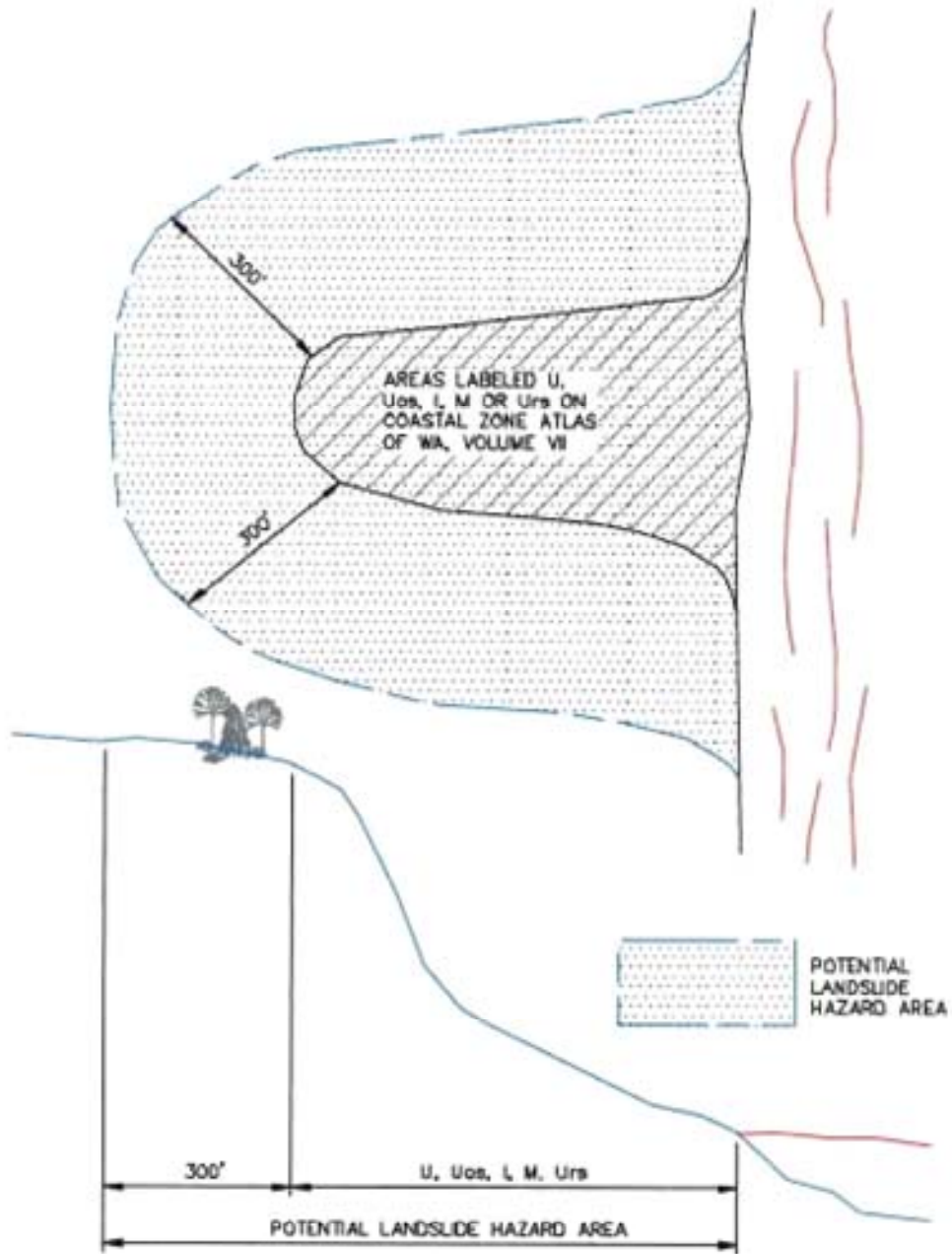
**Copied By:** DOC

**Adopted by:** Ord. No. 710

**Effective Date:** May 2, 2005

**FIGURE** 18D.80-1





**POTENTIAL LANDSLIDE HAZARD AREA -  
AREAS LABELED U, Uos, I, M OR Urs**

N.T.S.



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Community Development Department  
149 S. Hodgden  
Tenino, WA 98589 (360) 264-2368

**POTENTIAL LANDSLIDE HAZARD AREA AREAS  
LABELED U, Uos, I, M, or Urs**

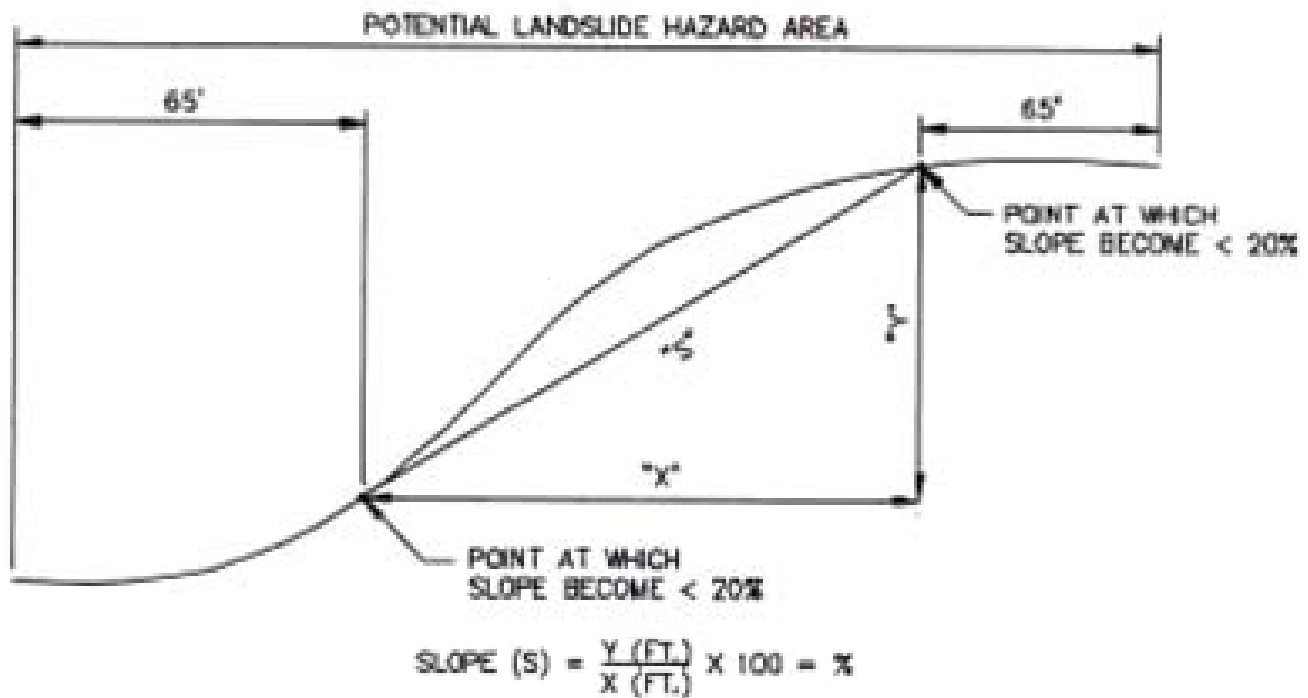
Copied By: DOC

Adopted by: Ord. No. 710

Effective Date: May 2, 2005

FIGURE

18D.80-2



**POTENTIAL LANDSLIDE HAZARD AREA - SLOPES  
GREATER THAN 20% WITH GREATER THAN 20'  
VERTICAL RELIEF**



**City of Tenino**  
Community Development Department  
149 S. Hodgden  
Tenino, WA 98589 (360) 264-2368

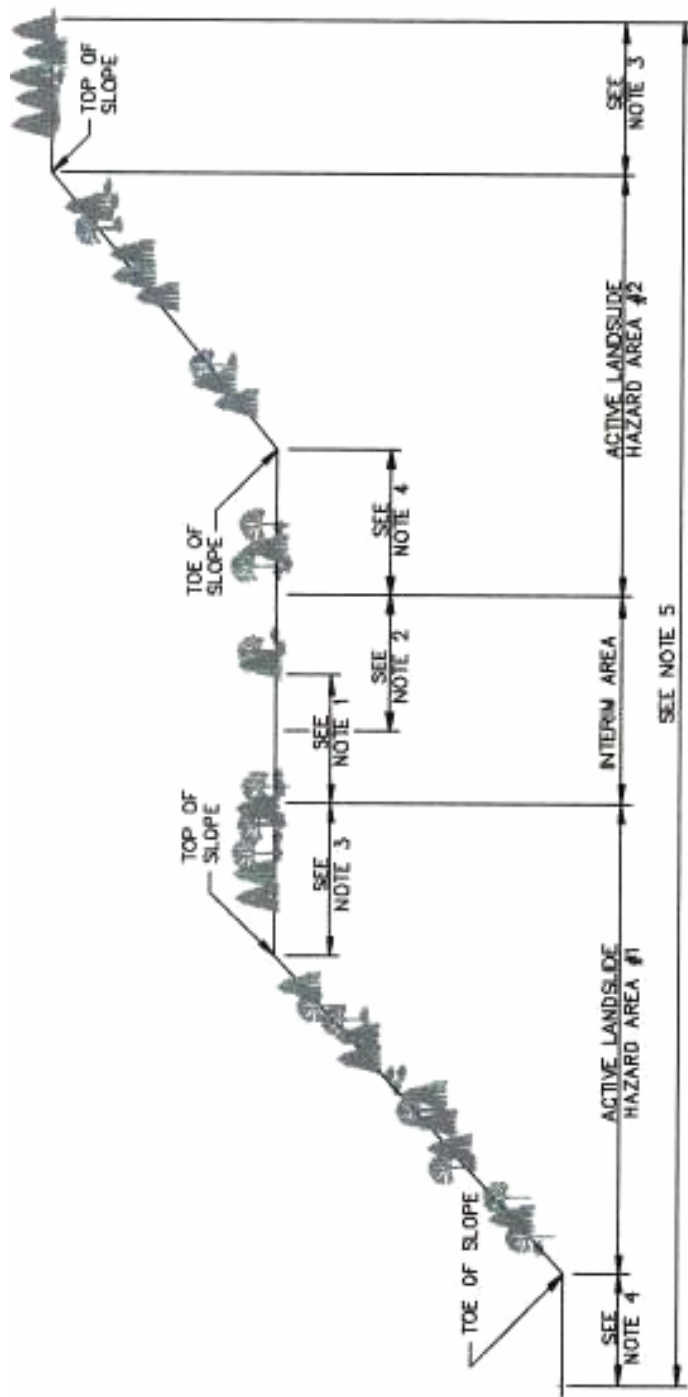
**SLOPES GREATER THAN 20% WITH  
GREATER THAN 20' VERTICAL RELIEF**

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Effective Date: May 2, 2005

FIGURE 18D.80-3



**NOTES:**

1. BUFFER FOR ACTIVE LANDSLIDE HAZARD AREA #1 AS PER SECTION 18E.80.050A.
2. BUFFER FOR ACTIVE LANDSLIDE HAZARD AREA #2 AS PER SECTION 18E.80.050A.
3. TOP OF SLOPE AREA THAT IS SUBJECT TO FAILURE AND SLIDING.
4. TOE OF SLOPE AREA SUBJECT TO DOWN SLOPE RUN-OUT.
5. ACTIVE LANDSLIDE HAZARD AREA #1, THE INTERIM AREA AND ACTIVE LANDSLIDE HAZARD AREA #2 SHALL BE COMBINED INTO ONE ACTIVE LANDSLIDE AREA WHEN THE BUFFERS FOR ACTIVE LANDSLIDE HAZARD AREA #1 AND #2 OVERLAP OR CONCOIDE.

**INTERIM AREAS BETWEEN LANDSLIDE HAZARD AREAS**

N.T.S.



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Community Development Department  
149 S. Hodgden  
Tenino, WA 98589 (360) 264-2368

**INTERIM AREAS BETWEEN LANDSLIDE HAZARD AREAS**

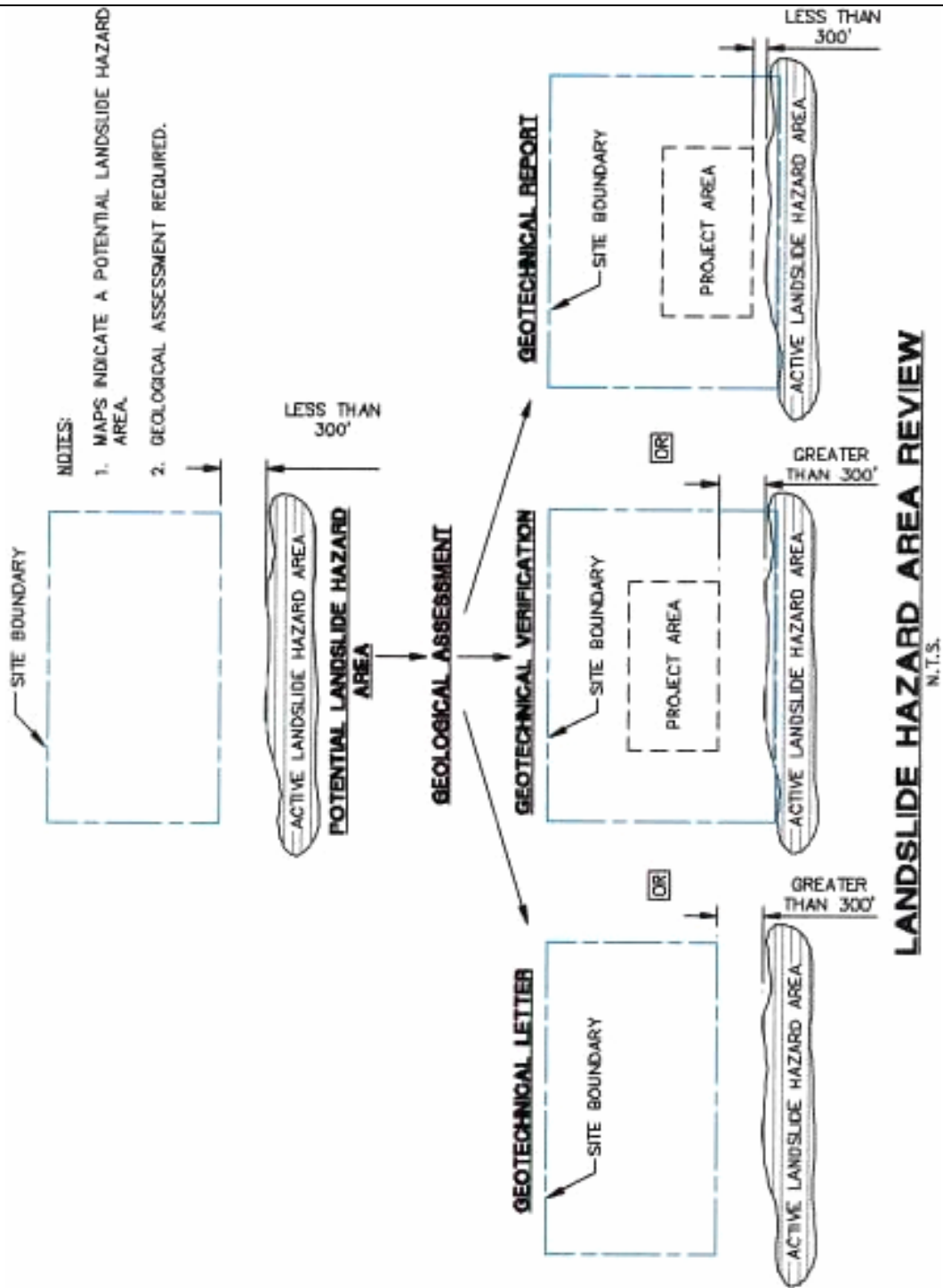
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FIGURE

18D.80-4



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Community Development Department  
149 S. Hodgden  
Tenino, WA 98589 (360) 264-2368

## LANDSLIDE HAZARD AREA REVIEW

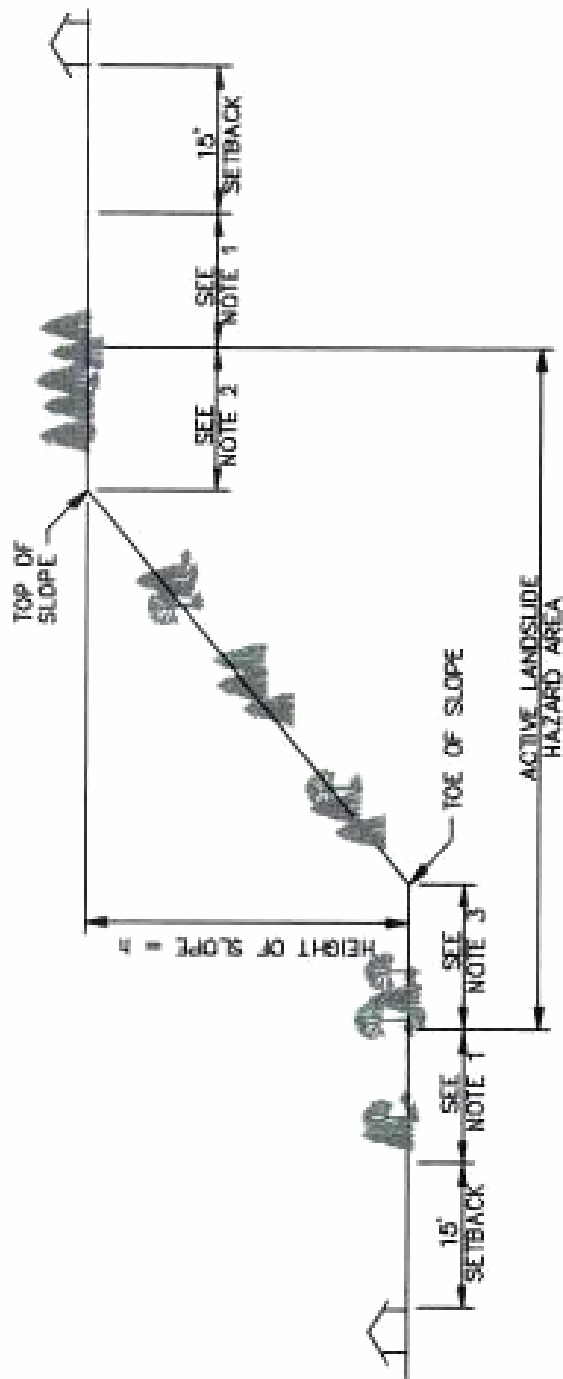
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Effective Date: May 2, 2005

FIGURE

18D.80-5



**NOTES:**

1. BUFFER DISTANCE AS PER SECTION 18E.80.050A
2. TOP OF SLOPE AREA THAT IS SUBJECT TO FAILURE AND SLIDING.
3. TOE OF SLOPE AREA SUBJECT TO DOWN SLOPE RUNOUT.

**REQUIRED BUFFERS FOR ACTIVE  
LANDSLIDE HAZARD AREAS**

N.T.S.



**City of Tenino**  
Community Development Department  
149 S. Hodgden  
Tenino, WA 98589 (360) 264-2368

**REQUIRED BUFFERS FOR ACTIVE  
LANDSLIDE HAZARD AREAS**

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FIGURE

18D.80-6

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## Chapter 18D.90

### SEISMIC (EARTHQUAKE) HAZARD AREAS

#### Sections:

- [18D.90.010](#) Purpose.
- [18D.90.020](#) Seismic Hazard Areas.
- [18D.90.030](#) Seismic Hazard Area Review Procedures.
- [18D.90.040](#) Seismic Hazard Area Standards.
- [18D.90.050](#) Buffer Requirements.
- [18D.90.060](#) Appendices.
  - A. Geological Assessment - Liquefaction or Dynamic Settlement Hazard Area.
  - B. Geological Assessment - Fault Rupture Hazard Area.
- [18D.90.070](#) Figures.
  - 14.90-1 Fault Rupture Hazard Areas.
  - 14.90-2 Seismic Hazard Area Review.
  - 14.90-3 Fault Rupture Hazard Area Buffers.

#### 18D.90.010 Purpose.

Earthquakes have historically occurred throughout the Puget Sound region. Large earthquakes have caused loss of life and billions of dollars in property damage. The purpose of this Chapter is to protect the public health, safety, and general welfare of the citizens of Tenino from the damaging effects of earthquakes. This Chapter provides standards to ensure life safety and minimize public and private losses that may occur within a seismic hazard area.

#### 18D.90.020 Seismic Hazard Areas.

- A. **General.** Seismic hazard areas are areas subject to severe risk of damage as a result of earthquake-induced landsliding, seismic ground shaking, dynamic settlement, fault rupture, soil liquefaction, or flooding caused by tsunamis and seiches.
- B. **Potential Seismic Hazard Areas.** Potential seismic hazard areas, as depicted on the Critical Areas Seismic Hazard Areas map, are those areas where the suspected risk of earthquake induced landsliding, dynamic settlement, fault rupture, and ground deformation caused by soil liquefaction or flooding is sufficient to require a further seismic hazard area review as set forth in Section 18D.90.030. These potential seismic hazard areas are determined using the following criteria:
  - 1. **Earthquake Induced Landslide Hazard Areas.** Areas identified as potential landslide hazard areas in Chapter 18D.80, Section 18D.80.020.
  - 2. **Liquefaction and/or Dynamic Settlement Hazard Areas.** Areas identified as *Moderate to High* and *High* liquefaction susceptibility areas as depicted on the Washington Department of Natural Resources, Division of Geology and Earth Resources Liquefaction Susceptibility Map of Thurston County, September 2004.
  - 3. [Fault Rupture Hazard Areas](#). (Reserved)
- C. **Seismic Hazard Area Categories.**
  - 1. **Earthquake Induced Landslide Hazard Areas.** Earthquake induced landslide hazard areas include slopes that can become unstable as a result of strong ground shaking, even though these areas may be stable under non-seismic conditions.
  - 2. **Liquefaction and/or Dynamic Settlement Hazard Areas.**

- a. Liquefaction hazard areas are areas underlain by unconsolidated (corrected Standard Penetration Test blow counts,  $[(N_1)_{60}]$  less than 30) sandy or silt soils (Unified Soil Classification System S or M soil-types) and a shallow groundwater table (static groundwater depth < 30') capable of liquefying in response to earthquake shaking.
  - b. Dynamic settlement hazard areas are areas underlain by a significant thickness (more than 10') of loose or soft soil not susceptible to liquefaction (e.g., peats or organic silts and clays, unsaturated loose sands or silts), but that could result in vertical settlement of the ground surface in response to earthquake shaking.
3. **Fault Rupture Hazard Areas.** Fault rupture hazard areas include:
- a. Active fault rupture hazard areas are areas where displacement (movement up, down, or laterally) of the ground surface has occurred during past earthquake(s) in the Holocene Epoch; and
  - b. Areas adjacent to the active fault rupture hazard area that may be potentially subject to ground surface displacement in a future earthquake (see [Figure 18D.90-1](#)).

### **18D.90.030 Seismic Hazard Area Review Procedures.**

#### **A. General Requirements.**

- 1. The City's Critical Areas Seismic Hazard Area map (Washington Department of Natural Resources, Division of Geology and Earth Resources Liquefaction Susceptibility Map of Thurston County, September 2004) provides an indication of where potential seismic hazard areas are located within the City.
- 2. The Department will complete a review of the Critical Areas Seismic Hazard Area map for any regulated activity to determine whether the site for a proposed regulated activity is located within a seismic hazard area.
- 3. When Department maps indicate that the site for a proposed regulated activity is located within a potential liquefaction or dynamic settlement hazard area, the Department shall require the submittal of a geological assessment as outlined in Section 18D.90.030 B. below (see [Figure 18D.90-2](#)).
- 4. When the Department's maps indicate that the site for a proposed regulated activity is located within a potential fault rupture hazard area, the Department shall require the submittal of a geological assessment as outlined in Section 18D.90.030 B. below. The requirement to submit a geological assessment may be waived at the Departments discretion when it is determined that the proposed project area for the regulated activity is located outside the potential fault rupture hazard area.
- 5. When the Department's maps indicate that the site for a proposed regulated activity is or may be located within a potential earthquake-induced landslide hazard area, the Department shall conduct a review pursuant to the requirements set forth in Section 18D.80.030.
- 6. Unless otherwise stated in this Chapter, the critical area protective measure provisions contained in Section 18D.10.080 shall apply.

#### **B. Geological Assessments.** A geological assessment is a site investigation process to evaluate the on-site geology affecting a subject property and define the extent and severity of potential seismic hazards.

- 1. A geological assessment shall be required when the Department's maps, sources, or field investigation indicate a site contains a potential liquefaction, dynamic settlement, or fault rupture hazard area. Geological assessments shall be submitted to the Department for review and approval together with a seismic hazard area application.



2. A geotechnical professional(s) shall complete a field investigation and geological assessment to determine whether or not the site for a proposed regulated activity is located within a liquefaction or dynamic settlement hazard area (see [Figure 18D.90-2](#)).
  - a. The geological assessment shall be submitted in the form of a geotechnical letter when the geotechnical professional(s) finds that no liquefaction or dynamic settlement hazard areas exist within the site. The geotechnical letter shall meet the requirements contained in 18D.90.060 Appendix A.
  - b. The geological assessment shall be submitted in the form of a geotechnical verification when the geotechnical professional(s) finds that a liquefaction or dynamic settlement hazard area exists on the site but is located outside the proposed project area. The geotechnical verification shall meet the requirements contained in 18D.90.060 Appendix A.
  - c. The geological assessment shall be submitted in the form of a geotechnical report when the geotechnical professional(s) finds that a liquefaction or dynamic settlement hazard area exists within the proposed project area. The geotechnical report shall meet the requirements contained in 18D.90.060 Appendix A.
3. An engineering geologist shall complete a field investigation and geological assessment presented in the form of a geotechnical report to determine whether or not the site for a proposed regulated activity is located within a fault rupture hazard area. The geological assessment shall meet the requirements contained in 18D.90.060 Appendix B. Any structural recommendations proposed to mitigate the fault rupture hazard that are included in the geotechnical report shall be prepared by an engineer.
4. All geological assessments for seismic hazards submitted under this Chapter shall include at a minimum, the following:
  - a. The dates when the geological assessment was conducted and when the assessment was prepared.
  - b. The parcel number(s) of the subject property.
  - c. Site address, if the City has assigned one.
  - d. A brief description of the project (including the proposed land use) and the area to be developed.
  - e. A map showing the property lines for the site, existing two-foot contours of the existing site topography, and the location of any existing structures, utilities, wells, stormwater or septic systems, or other developments.
  - f. A site plan delineating the limits of the proposed development and the location of all areas of the site subject to potential seismic hazards based on the Critical Areas Atlas-Seismic Hazard Areas Map and, if applicable, limits of associated buffers.
  - g. A description of the surface and subsurface geology, hydrology, soils, and vegetation of the site.
  - h. A detailed overview of the field investigations, published data and references, data and conclusions from past geological assessments or geotechnical investigations of the site, site-specific measurements, tests, investigations, or studies, as well as the methods of data analysis and calculations that support the determination regarding whether liquefaction and/or dynamic settlement hazards are present on the site.
  - i. The results, conclusions, and recommendations resulting from the geological assessment of the liquefaction and/or dynamic settlement hazards on the subject property as prepared by a geotechnical professional(s).

5. Geological assessments shall be prepared, signed, and dated by the appropriate geotechnical professional(s) (as defined in Section 18D.10.060 and established in this Chapter) and the format shall be pre-approved by the Department.
6. Geological assessments that do not contain the minimum required information will be returned to the geotechnical professional(s) for revision.
7. The Department shall review the geological assessment and either:
  - a. Accept the geological assessment and approve the application; or
  - b. Reject the geological assessment and require revisions or additional information.
8. A geological assessment for a specific site may be valid for a period of up to five years when the proposed land use activity and surrounding site conditions are unchanged. However, if any environmental conditions associated with the site change during that five-year period, the applicant may be required to submit an amendment to the geological assessment.

#### **18D.90.040 Seismic Hazard Area Standards.**

- A. **Earthquake Induced Landslide Hazard Areas.** All standards set forth in Chapter 18D.80 shall apply to earthquake induced landslide hazard areas.
- B. **Liquefaction and/or Dynamic Settlement Hazard Areas.**
  1. **Buildings.** All building structures shall conform to the standards set forth in TMC Title 15, Building and Construction.
  2. **Utility Lines.** Utility lines, except for gas pipelines, which are prohibited, will be permitted when no other conveyance alternative is available. The line shall be located above ground and properly anchored and/or designed so that it will continue to function in the event of seismically induced ground deformation. Provision for automatic shut-off of utilities in a ground-rupturing event will be required.
  3. **Roads, Bridges, and Trails.** Roads, bridges, and trails shall be allowed when mitigation measures are provided that ensure the roadway prism and/or bridge structure will not be susceptible to damage from seismic induced ground deformation. Mitigation measures shall be designed for static and seismic loading conditions in accordance with the most recent version of the American Association of State Highway and Transportation Officials ([AASHTO](#)) Manual and also for an estimated range of ground surface offset presented in the geotechnical report.
- C. **Fault Rupture Hazard Areas.** Any development, encroachment, filling, grading, or building structures shall be prohibited within fault rupture hazard areas and associated buffers except as specified in the following standards:
  1. **Utility Lines.** Utility lines, except for gas pipelines, which are prohibited, will be permitted when no other conveyance alternative is available. The line shall be located above ground and properly anchored and/or designed so that it will continue to function in the event of seismically-induced ground deformation. Provision for automatic shut-off of utilities in a ground-rupturing event will be required.
  2. **Roads, Bridges, and Trails.** Roads, bridges, and trails shall be allowed when all of the following conditions have been met:
    - a. Mitigation measures are provided that ensure the roadway prism and/or bridge structure will not be susceptible to damage from seismically-induced ground deformation. Mitigation measures shall be designed for static and seismic loading conditions in accordance with the most recent version of the American Association of State Highway and Transportation Officials ([AASHTO](#)) Manual and also for an estimated range of ground surface offset presented in the geotechnical report.

- b. The road is not a sole access for a development.

#### **18D.90.050 Buffer Requirements.**

##### **A. Determining Buffer Widths.**

1. The buffer width shall be measured on a horizontal plane from a perpendicular line established at the edge of the fault rupture hazard area limits (see [Figure 18D.90-3](#)).
2. A buffer is an area that is adjacent to a fault rupture hazard area that may be potentially subject to ground surface displacement in a future earthquake. No development shall be permitted within a fault rupture hazard area and its associated buffer. The required buffer width is the greater amount of the following distances:
  - a. Fifty feet from all edges of a fault rupture hazard area, except for high occupancy or essential facilities, where the minimum buffer distance shall be 100'; or
  - b. The required buffer width is the minimum distance recommended by the geotechnical professional(s).

- B. Modification of Buffer Widths.** The Department may require a larger buffer width than the buffer distance, as determined in A. above, if the Department determines the standard or proposed buffer is not adequate to protect the health, safety, or welfare of any proposed development.

#### **18D.90.060 Appendices.**

- A. [Geological Assessments - Liquefaction or Dynamic Settlement Hazard Areas.](#)
- B. [Geological Assessments - Fault Rupture Hazard Areas.](#)

#### **18D.90.070 Figures.**

- 18D.90-1 [Fault Rupture Hazard Areas.](#)  
18D.90-2 [Seismic Hazard Area Review.](#)  
18D.90-3 [Fault Rupture Hazard Area Buffers.](#)

## **18D.90.060 Appendices.**

### **APPENDIX A GEOLOGICAL ASSESSMENTS LIQUEFACTION OR DYNAMIC SETTLEMENT HAZARD AREAS**

#### **I. GEOTECHNICAL LETTER**

- A. A geotechnical letter shall, at a minimum, include the following:
1. The letter shall be labeled identifying the submittal as a "Liquefaction or Dynamic Settlement Hazard Geotechnical Letter," and will include all mandatory items listed in Section 18D.90.030 B.4.
  2. The geological assessment must include a determination an evaluation that no portion of the subject property [site] includes a liquefaction and/or dynamic settlement hazard.
  3. A paragraph that states the following specific language:

"The services described in this report were completed under the responsible charge of (Individual's Name). (Individual's Name) meets the qualifications contained in Section 18D.90.030 to prepare this geological assessment. (Individual's Name) understands the requirements of the current Seismic (Earthquake) Hazard Areas Chapter 18D.90 and the definitions of the applicable terms contained within Title 18D. Individuals under my responsible charge have conducted an investigation in general accordance 18D.90.060 - Appendix A. Geotechnical Letter - Liquefaction or Dynamic Settlement Hazard Areas. In my opinion, the scope of services completed for this project is adequate to meet the requirements of the Department and it does not appear that a liquefaction and/or dynamic settlement hazard area exists within the boundaries of the proposed site."

4. The name, mailing address and telephone number of geotechnical professional(s) who prepared the letter.
  5. The name, mailing address, and telephone number of the property owner.
- B. The Geotechnical Letter shall be prepared under the responsible charge of an appropriately licensed geotechnical professional(s) and be signed, sealed and dated by the geotechnical professional(s) (as defined in Section 18D.10.160) and the format shall be pre-approved by the Department.

#### **II. GEOTECHNICAL VERIFICATION EVALUATION**

- A. A geotechnical evaluation verification shall, at a minimum, include the following:
- B. The first page of the document shall be labeled identifying the submittal as a "Liquefaction or Dynamic Settlement Hazard Geotechnical Verification Evaluation," and will include all mandatory items listed in Section 18D.90.030 B.4.
- C. The geological assessment must include a determination an evaluation that a liquefaction and/or dynamic settlement hazard exists on the site, but is located outside the proposed project area.
- D. The verification Geotechnical Evaluation shall include an accurate site plan drawn at a scale of 1" = 20', 1" = 30', 1" = 50' (or other scale deemed appropriate by the Department) is required.

The Department may require that the site plan information be based on a field survey by a licensed surveyor. The site plan shall include:

- E. Property lines for the site, and the location of any existing structures.
- F. The existing site topography presented in two-foot contours.
- G. The limits/location of any liquefaction and/or dynamic settlement hazard area(s) as set forth in Section 18D.90.020C2.
- H. The full geographical limits of the proposed project area (i.e., area to be developed) and the location of any proposed structures, on-site septic systems, wells, and stormwater management features or facilities associated with the development.
- I. The limits of any setbacks from the defined locations of the liquefaction and/or dynamic settlement hazard areas determined by the geotechnical professional(s) as necessary to protect any portion of the proposed development activity from damage caused by liquefaction-induced ground displacement.
- J. A paragraph that states the following specific language:

"The services described in this report were completed under the responsible charge of (Individual's Name). (Individual's Name) meets the qualifications contained in Section 18D.90.030 to prepare this geological assessment. (Individual's Name) understands the requirements of the current Seismic (Earthquake) Hazard Areas Chapter 18D.90 and the definitions of the applicable terms contained within Chapter 18D.10. Individuals under my responsible charge have conducted an investigation in general accordance 18D.90.060 - Appendix A Geotechnical Evaluation - Liquefaction or Dynamic Settlement Hazard Areas. In my opinion, the scope of services completed for this project is adequate to meet the requirements of the Department and it does not appear that a liquefaction and/or dynamic settlement hazard area exists within the boundaries of the proposed site."
- K. The name, mailing address, and telephone number of geotechnical professional(s) who prepared the letter.
- L. The name, mailing address, and telephone number of the property owner.
- M. The geotechnical report shall be prepared under the responsible charge of an appropriately licensed geotechnical professional(s) and be signed, sealed and dated by the geotechnical professional(s) and the format shall be pre-approved by the Department.
- N. Hold harmless clauses, disclaimers, and limitations are not allowed within a geotechnical verification.

### **III. GEOTECHNICAL REPORT**

- A. A geotechnical report shall, at a minimum, include the following:
  - 1. The first page of the document shall be labeled identifying the submittal as a "Liquefaction or Dynamic Settlement Hazard Geotechnical Report," and will include all mandatory items listed in Section 18D.90.030B4. The report shall be prepared by an engineer and shall be co-written by an engineering geologist where geological interpretations and conclusions critical to the assessment of liquefaction and/or dynamic settlement hazard and potential effects are necessary or prudent. The introductory section of the report shall specify the desired performance level of the structures and other development facilities (e.g., safety to building occupants, minimal damage to structure, post-earthquake serviceability for pre-earthquake operations, no damage, etc.).

2. The results, conclusions, and recommendations resulting from the geological assessment of the liquefaction and/or dynamic settlement hazards on the subject property as prepared by the geotechnical professional(s).
3. The geological assessment-geotechnical report shall include:
  - a. A statement that the proposed project area falls within a liquefaction and/or dynamic settlement hazard area.
  - b. A detailed engineering evaluation of expected ground displacements or other liquefaction and/or dynamic settlement effects (e.g., bearing failures, floatation of buried tanks, etc.) and proposed mitigation measures to ensure an acceptable level of risk for the proposed structure type or other development facilities, as well as, the proposed land use type (i.e., occupancy category). The minimum level of acceptable risk for any proposed structure or development facility shall ensure the life safety of any occupant. Designs shall evaluate the range of alternatives for achieving limited structural damage to no structural damage based on the proposed use intended for the structure.
4. The report shall include an accurate site plan drawn at a scale of 1" = 20', 1" = 30', 1" = 50' (or other scale deemed appropriate by the Department) is required. The Department may require that the site plan information be based on a field survey by a licensed surveyor. The site plan shall include:
  - a. Property lines for the site and the location of any existing structures.
  - b. The existing site topography presented in two-foot contours.
  - c. The limits/location of any liquefaction and/or dynamic settlement hazard area(s) as set forth in Section 18D.90.020C2.
  - d. The full geographical limits of the proposed project area (i.e. area to be developed) and the location of any proposed structures, on-site septic systems, wells, and stormwater management features or facilities associated with the development.
  - e. The limits of any set-backs from the defined locations of the liquefaction and/or dynamic settlement hazard areas determined by the geotechnical professional(s) as necessary to protect any portion of the proposed development activity from damage caused by liquefaction-induced ground displacement.
  - f. Location and unique identifier of geotechnical borings and/or CPT soundings used to characterize subsurface conditions.
5. The field investigation shall require the following elements:
  - a. Subsurface characterization using conventional geotechnical borings and Standard Penetration Testing (SPT) or using Cone Penetration Testing (CPT).
  - b. Conventional geotechnical boring data shall be reported as a graphic log utilizing the following standards:
    - (1) The vertical scale of the graphic log shall be such that 5 feet of drilled depth is scaled to range of 1" to 2" (1:60- or 1:30-scale), and shall include vertical columns that record depth in 1-foot increments, SPT value and incremental blow counts, a graphic pattern representation of the soil type encountered during drilling, and sample descriptions and other comments regarding drilling.
    - (2) The graphic log shall have a header on the first page that includes a unique identifier for the boring, the times and dates of the start and completion of drilling, the manufacturer and model of the drilling rig, the company name of the drilling contractor, the name(s) of the site geologist(s) or engineer(s) overseeing the drilling activities, the details of the method used to advance the borehole (e.g., 4" i.d. hollow-stem auger), the type of drilling fluid used to stabilize the borehole, verification that

the SPT followed all applicable ASTM standards including a description of the sampler, hammer weight, drop height, the type of hammer used to perform the SPT, number of turns of rope if a cathead is used to raise the hammer, condition of rope (i.e., new, used, frayed, oily, etc.), and the depth of static groundwater measured immediately prior to abandonment of the boring and the time and date of this measurement.

- (3) All subsequent pages of the graphic log shall have the unique identifier for the boring, the times and dates of the start and completion of drilling, and the number of the page and the total number of pages comprising the log.
  - (4) Each SPT value will be reported in the appropriate column showing the blow counts recorded at each 6" interval, and the sum of the blow counts between penetration distances of 6" to 18", unless refusal conditions (50 or more blows with less than 6" of sampler penetration) are met anywhere in this interval. At refusal, the blow count shall be recorded as the number of blows with the corresponding sampler penetration, in inches.
  - (5) SPT tests shall be performed every 5 feet during drilling, at a minimum. Additional undisturbed samples, collected following ASTM standards for undisturbed soil sampling, cannot be substituted for SPT testing.
  - (6) The soil sample descriptions will include the total length of the recovered sample, the soil color, odor, the density or consistency (loose to very dense, very soft to very stiff), degree of water saturation (dry, moist, wet, saturated), and dilatancy. For granular (sand and gravel) soils, the description shall include a physical description of the soil sample, including size distribution (poorly or well graded), angularity, composition, amount and plasticity of the fines fraction. For fine soils (silt and clay), the description shall include a qualitative estimate of the proportion of the silt and clay size particles (e.g., silty clay, clay with some silt, etc.), plasticity, and amount and type of organic material. The sample description shall include a description of any bedding, laminations, slickensides, or other textural or deposition features, including contact between dissimilar soil types. The sample description shall also include a field classification of the soil sample using the Unified Soil Classification System where the classification is expressed in lower case letters (e.g., sp, ml, etc.). The sample classification shall be expressed in upper case letters (e.g., SP, ML, etc.) where subsequent laboratory testing has been performed. This column of the graphic log will also include any other information relevant to the subsurface investigation, such as loss of drilling fluid, heaving, churning of the drill in gravelly soils, etc.
- c. CPT sounding data shall be reported as a graphic log utilizing the following standards:
- (1) The vertical scale of the graphic log shall be such that 5 feet of penetrated depth is scaled to range of 1" to 2" (1:60- or 1:30-scale), and shall include vertical columns that record depth in 1 ft. increments.
  - (2) The graphic log shall have a header on the first page that includes a unique identifier for the boring, the times and dates of the start and completion of the CPT sounding, the manufacturer and model of the CPT system, the company name of the CPT service contractor, the name(s) of the site geologist(s) or engineer(s) overseeing the CPT sounding, and any comments regarding the conduct of the testing, reaction of the CPT system during sounding, etc.

- (3) All subsequent pages of the graphic log shall have the unique identifier for the boring, the times and dates of the start and completion of drilling, and the number of the page and the total number of pages comprising the log.
  - (4) The graphic log shall display, at a minimum, a continuous depth plot of the uncorrected tip resistance, the friction (sleeve) resistance, the friction ratio, and the measured pore pressure with an overlay of the calculated hydrostatic pore pressure. These curves shall be plotted so as to show the full variation of the measured quantities within the depth range of the sounding, and each curve shall have a visible scale with the minimum and maximum ranges labeled.
  - (5) All of the CPT data recorded for each sounding shall also be provided in either electronic or hardcopy format. Electronic data will be presented in an ASCII text file format.
- d. All SPT or CPT testing will be conducted to a minimum depth of 50 feet below the existing ground surface or lowest proposed finished grade, except where a minimum thickness of 10 feet of consolidated soils are encountered where the  $(N_1)_{60}$  is greater than 30, or CPT corrected tip resistance ( $q_{cIN}$ ) is greater than 175. In addition, SPT or CPT testing should extend a minimum of 20 feet below the lowest expected foundation level, including the lowest elevation of piling support.
6. The three-dimensional subsurface conditions at the site shall be presented using one or more cross-sections showing location and depth penetration of borings or CPT soundings, interpretation of the geometry of major soil units, and projected location of the static groundwater surface determined from the subsurface exploration. The cross-sections shall be presented at a scale of 1" = 20', 1" = 30', 1" = 50' (or other scale deemed appropriate by the Department). Each cross-section shall have a legend with a description of the various major soil units.
  7. All assessments of liquefaction and/or dynamic settlement hazards and effects will be based on a design earthquake using ground motion parameters consistent and equivalent to those specified in the Uniform Building Code. The choice of moment magnitude used in the determination of the magnitude-scaling factor, as well as the scaling relations used in the analysis, shall be justified in the report narrative. These assessments shall use the shallowest groundwater table observed during or inferred from subsurface exploration and characterization (e.g., the measured depth of static groundwater immediately prior to abandonment of borings, observation of iron-oxide mottling of soils samples, etc.).
  8. Results of laboratory testing of samples retrieved during drilling and sampling shall be presented in order to support the values of fines contents used in subsequent analysis of liquefaction and/or dynamic settlement hazard. Where only CPT methods are used in site assessment, the correlation between fines content and CPT measurements will be discussed and documented. This documentation will require rigorous correlation of CPT and fines content measurements from similar geological deposits within the Puget Sound region.
  9. The geotechnical report shall include a detailed assessment of the liquefaction and/or dynamic settlement hazard based on analysis of all available SPT or CPT data using state-of-the-practice methodologies, such as provided in Youd and Idriss (1997) or subsequent technical publications. The methodology used in the analysis shall be documented, and all results of intermediate and final calculations and results, including factors of safety, shall be included.
  10. The geotechnical report shall contain an assessment of the potential for large lateral spreads or flow failures, bearing failures, settlement, limited lateral displacement, and floatation of



buried facilities. The methodologies used must be, at a minimum, state-of-the-practice, and where applicable should employ more than one method of analysis. All results of intermediate and final calculations and conclusions regarding the potential and severity of the possible liquefaction- and/or dynamic settlement- induced failure modes shall be presented.

11. Alternative mitigative measures including structural and foundation design options and/or soil improvement techniques shall be evaluated and compared for their effectiveness in reaching the level of performance specified in the report introduction. Final designs and specifications and plans for structural and/or foundation design shall be included if applicable. Effectiveness of soil improvement techniques shall be specified in terms of post-treatment densification or strength improvement as measured by appropriate subsurface investigation and testing. The extent of the post-treatment verification testing shall be provided on a site map at the same scale as the map presented in Section 4 above.
  12. The name, mailing address, and telephone number of geotechnical professional(s) who prepared the letter.
  13. The name, mailing address, and telephone number of the property owner.
- B. The geotechnical professional(s) who prepared the geotechnical report shall stamp the report with his or her license stamp/seal.
- C. Hold harmless clauses, disclaimers, and limitations are not allowed within a geotechnical report.

## **18D.90.060 Appendices.**

### **APPENDIX B**

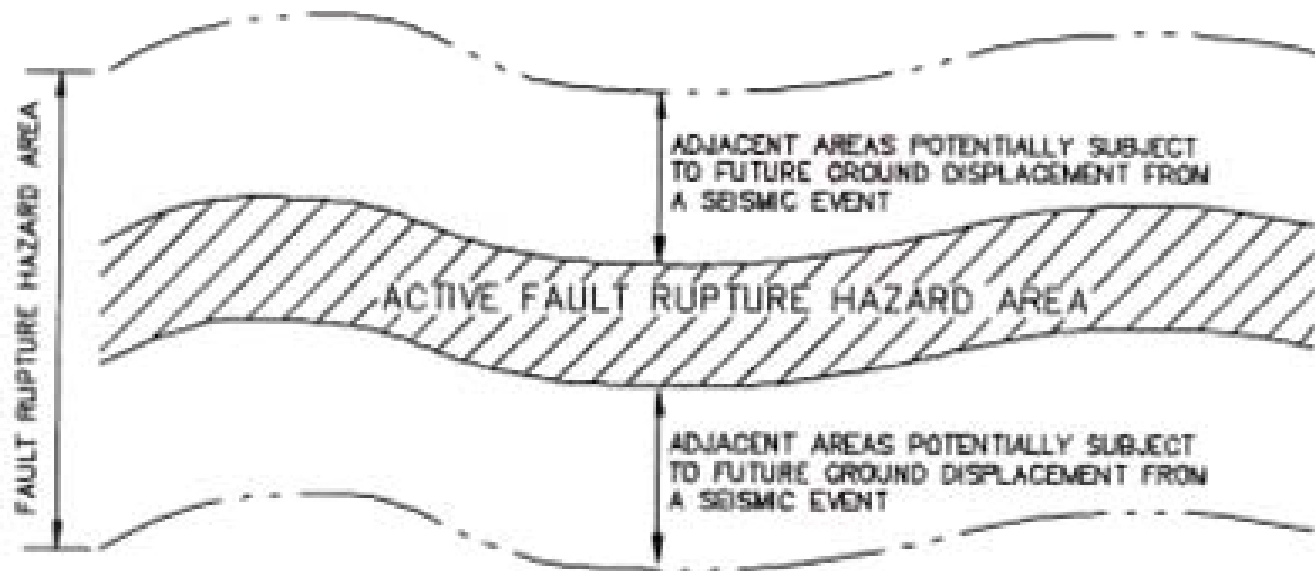
#### **GEOLOGICAL ASSESSMENTS FAULT RUPTURE HAZARD AREA GEOTECHNICAL REPORT**

- A. A geotechnical report shall, at a minimum, include the following:
1. The first page of the document shall be labeled identifying the submittal as a "Fault Rupture Hazard Geotechnical Report," and will include all mandatory items listed in Section 18D.90.030B4. The report shall be prepared by an engineer and shall be co-written by an engineering geologist where geological interpretations and conclusions critical to the assessment of liquefaction and/or dynamic settlement hazard and potential effects are necessary or prudent.
  2. The geological assessment for fault rupture hazards shall include the minimum requirements specified in Section 18D.90.030B4.
  3. The following topics should be considered and addressed in detail where essential to support opinions, conclusions, and recommendations in any geologic report on faults. It is not expected that all the topics or investigative methods would be necessary in a single investigation. In specific cases, it may be necessary to extend some of the investigative methods well beyond the site or property being investigated.
    - a. Purpose and scope of investigation; description of proposed development.
    - b. Geologic and tectonic setting. Include seismicity and earthquake history.
    - c. Site description and conditions, including dates of site visits and observations. Include information on geologic units, graded and filled areas, vegetation, existing structures, and other factors that may affect the choice of investigative methods and interpretation of data.
    - d. Methods of investigation.
      - (1) Review of published and unpublished literature, maps, and records concerning geologic units, faults, groundwater barriers, and other factors.
      - (2) Stereoscopic interpretation of aerial photographs and other remotely sensed images to detect fault-related topography (geomorphic features), vegetation and soil contrasts, and other lineaments of possible fault origin. The area interpreted usually should extend beyond the site boundaries.
      - (3) Surface observations, including mapping of geologic and soil units, geologic structures, geomorphic features and surfaces, springs, deformation of engineered structures due to fault creep, both on and beyond the site.
      - (4) Subsurface investigations.
        - (a) Trenching and other excavations to permit detailed and direct observation of continuously exposed geologic units, soils, and structures; must be of adequate depth and be carefully logged (Taylor & Cluff 1973, Hatheway & Leighton 1979, McCalpin 1996b).
        - (b) Borings and test pits to permit collection of data on geologic units and groundwater at specific locations. Data points must be sufficient in number and spaced adequately to permit valid correlations and interpretations.
        - (c) Cone penetrometer testing (CPT) (Grant et al 1997, Edelman et al 1996). CPT must be done in conjunction with continuously logged borings to correlate CPT results with on-site materials. The number of borings and spacing of CPT

- soundings should be sufficient to adequately image site stratigraphy. The existence and location of a fault based on CPT data are interpretative.
- (5) Geophysical Investigations. These are indirect methods that require a knowledge of specific geologic conditions for reliable interpretations. They should seldom, if ever, be employed alone without knowledge of the geology (Chase & Chapman 1976). Geophysical methods alone never prove the absence of a fault nor do they identify the recency of activity. The types of equipment and techniques used should be described and supporting data presented (California Board of Registration for Geologists and Geophysicists 1993).
    - (a) High-resolution seismic reflection (Stephenson et al 1995, McCalpin 1996b).
    - (b) Ground penetrating radar (Cai et al 1996).
    - (c) Other methods include: seismic refraction, magnetic profiling, electrical resistivity, and gravity (McCalpin 1996b).
  - (6) Age-dating techniques are essential for determining the ages of geologic units, soils, and surfaces that bracket the time(s) of faulting (Pierce 1986, Birkeland et al 1991, Rutter & Catto 1995, McCalpin 1996a).
    - (a) Radiometric dating (especially <sup>14</sup>C).
    - (b) Soil-profile development.
    - (c) Rock and mineral weathering.
    - (d) Landform development.
    - (e) Stratigraphic correlation of rocks/minerals/fossils.
    - (f) Other methods – artifacts, historical records, tephrochronology, fault scarp modeling, thermoluminescence, lichenometry, paleomagnetism, dendrochronology, etc.
  - (7) Other methods should be included when special conditions permit or requirements for critical structures demand a more intensive investigation.
    - (a) Aerial reconnaissance overflights.
    - (b) Geodetic and strain measurements.
    - (c) Microseismicity monitoring.
- e. Conclusions.
- (1) Location and existence (or absence) of hazardous faults on or adjacent to the site; ages of past rupture events.
  - (2) Type of faults and nature of anticipated offset, including sense and magnitude of displacement, if possible.
  - (3) Distribution of primary and secondary faulting (fault zone width) and fault-related deformation.
  - (4) Probability of, or relative potential for, future surface displacement. The likelihood of future ground rupture seldom can be stated mathematically, but may be stated in semiquantitative terms such as low, moderate, or high, or in terms of slip rates determined for specific fault segments.
  - (5) Degree of confidence in, and limitations of data and conclusions.
- f. Recommendations.
- (1) The recommended increase from the standard buffer distance (50 feet) of proposed structures from fault rupture hazard areas. The recommended buffer distance generally will depend on the quality of data and type and complexity of fault(s) encountered at the site and the proposed land use type (i.e. occupancy). In order to establish an appropriate buffer distance from a fault located by indirect or interpretative methods (e.g., borings or cone penetrometer testing), the area between

data points also should be considered underlain by a fault unless additional data are used to more precisely locate the fault. Additional measures (e.g., strengthened foundations, engineering design, and flexible utility connections) to accommodate warping and distributive deformation associated with faulting (Lazarte and others, 1994).

- (2) Risk evaluation relative to the proposed development.
  - (3) Limitations of the investigation; need for additional studies.
  - g. References.
    - (1) Literature and records cited or reviewed; citations should be complete.
    - (2) Aerial photographs or images interpreted -- list type, data, scale, source, and index numbers.
    - (3) Other sources of information, including well records, personal communications, and other data sources.
  - h. Illustrations. The following illustrations should be provided:
    - (1) A location map that identifies site locality, significant faults, geographic features, regional geology, seismic epicenters, and other pertinent data; 1:24,000 scale is recommended.
    - (2) A site development map that shows site boundaries, existing and proposed structures and limits of the proposed project area, graded areas, streets, exploratory trenches, borings geophysical traverses, locations of faults, and other data; recommended scale is 1:2,400 (1 inch equals 200 feet), or larger.
    - (3) A geologic map that shows the distribution of geologic units (if more than one), faults and other structures, geomorphic features, aerial photo graphic lineaments, and springs; on topographic map 1:24,000 scale or larger; can be combined with h(1) or (2).
    - (4) Geologic cross sections, if needed, to provide three-dimensional picture.
    - (5) Logs of exploratory trenches and borings that show details of observed features and conditions (note: these should not be generalized or diagrammatic). Trench logs should show topographic profile and geologic structure at a 1:1 horizontal to vertical scale; scale should be 1:60 (1 inch = 5 feet) or larger.
    - (6) Geophysical data and geologic interpretations.
  - i. Appendix. Attach any supporting data not included above (e.g., water well data, photographs, aerial photographs).
4. The geotechnical professional who prepared the geotechnical shall stamp the report with his or her license stamp/seal.
  5. The Department may request a geotechnical professional to provide additional information in the geotechnical report based upon existing conditions, changed conditions, or unique circumstances occurring on a case by case basis.
- B. Hold harmless clauses, disclaimers, and limitations are not allowed to be included, neither expressly nor implied, within a geological assessment.



## FAULT RUPTURE HAZARD AREAS



**City of Tenino**  
Community Development Department  
149 S. Hodgden  
Tenino, WA 98589 (360) 264-2368

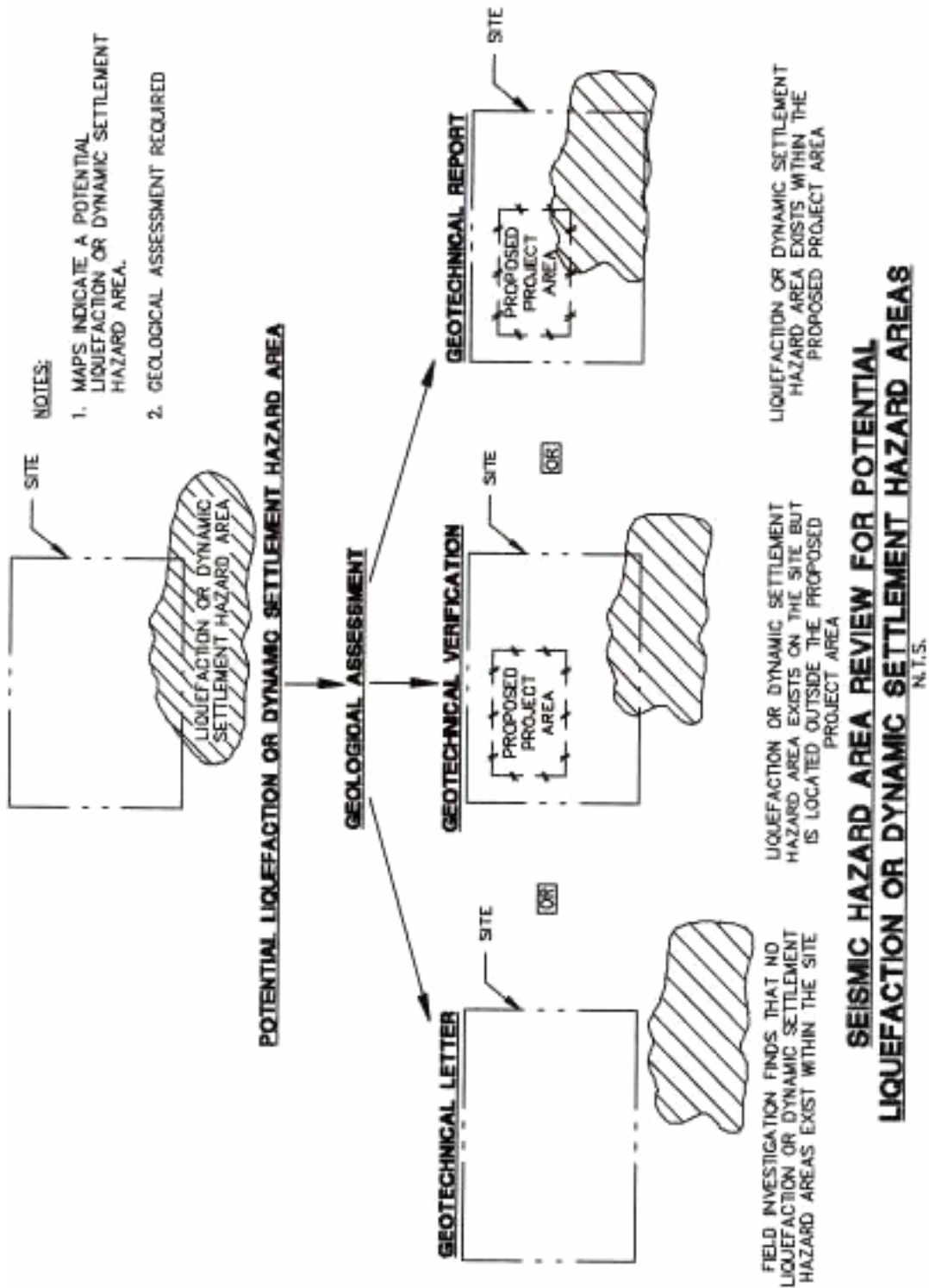
## **FAULT RUPTURE HAZARD AREAS**

Copied By: DOC

Adopted by: Ord. No. 710

Effective Date: May 2, 2005

FIGURE 18D.90-1



**City of Tenino**  
Community Development Department  
149 S. Hodgden  
Tenino, WA 98589 (360) 264-2368

## SEISMIC HAZARD AREA REVIEW FOR POTENTIAL LIQUEFACTION OR DYNAMIC SETTLEMENT HAZARD AREA

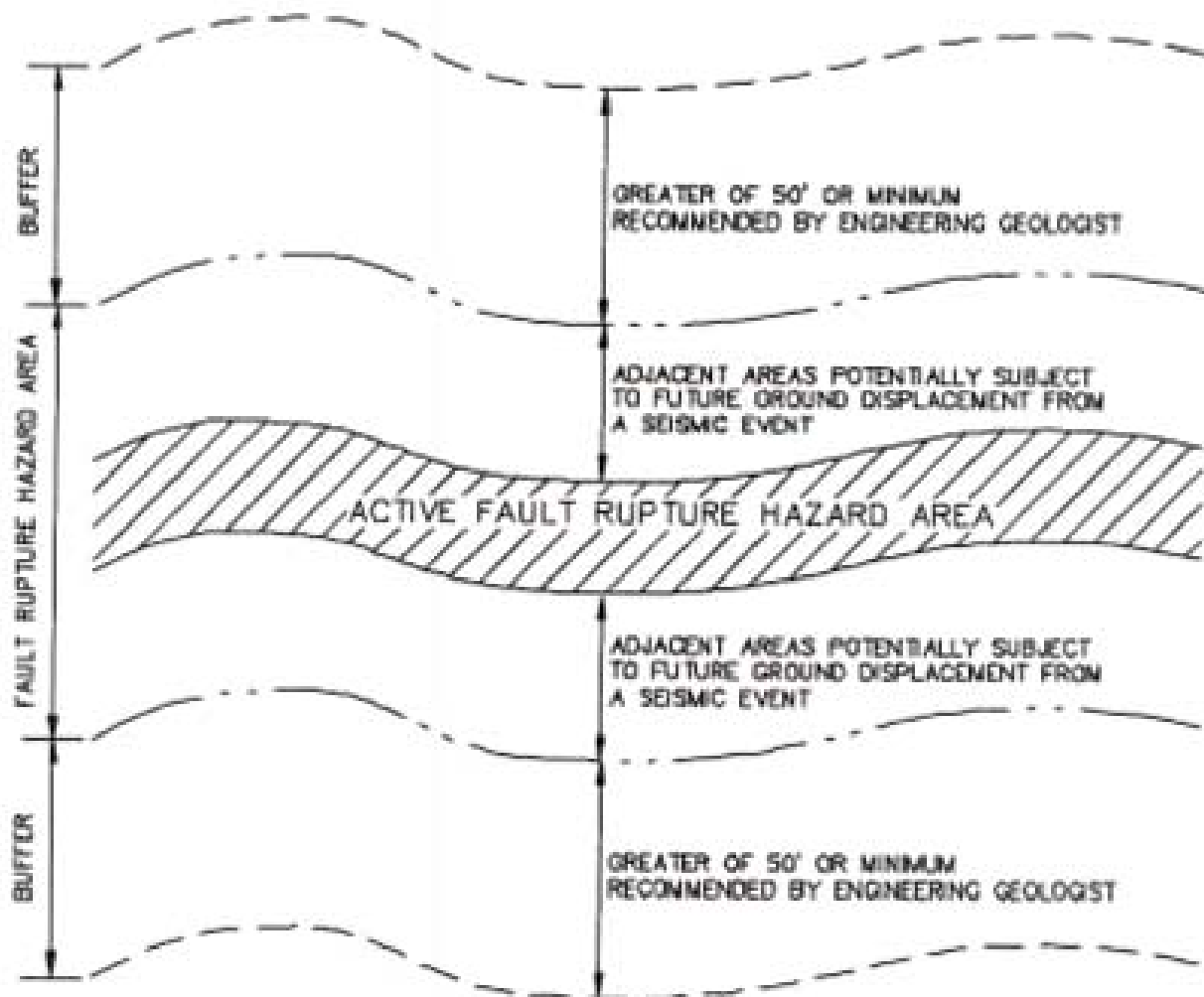
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Adopted by: Ord. No. 710

Effective Date: May 2, 2005

FIGURE

18D.90-2



## **FAULT RUPTURE HAZARD AREA BUFFERS**



**City of Tenino**  
Community Development Department  
149 S. Hodgden  
Tenino, WA 98589 (360) 264-2368

## **FAULT RUPTURE HAZARD AREA BUFFERS**

Copied By: DOC

Adopted by: Ord. No. 710

Effective Date: May 2, 2005

FIGURE

18D.90-3

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## **Chapter 18D.110**

### **EROSION HAZARD AREAS**

#### **Sections:**

**[18D.110.010](#) Statement.**

#### **18D.110.010 Statement.**

The City of Tenino adopts the definition of Erosion Hazards pursuant to WAC 365-190-080, which state that erosion hazard areas are those areas identified by the United States Department of Agriculture Soil Conservation Service as having a "severe" rill and inter-rill erosion hazard. The City of Tenino does not have lands within the City that possess these characteristics, and shall therefore regulate any potential erosion hazards through Grade and Fill regulations pursuant to TMC Title 15 - Building and Construction, Stormwater Management TMC Title 18F, and TMC Title 18G Shoreline Master Program. Erosion control relating to shorelines areas is also addressed in TMC 18D.40.040 Critical Fish and Wildlife Habitat Area Standards.

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## Chapter 18D.500

### NATURAL RESOURCE LANDS

#### Sections:

[18D.500.010](#) Purpose.

[18D.500.020](#) Intent.

[18D.500.030](#) Applicability.

[18D.500.040](#) Natural Resource Lands Noticing Requirements.

[18D.500.050](#) Current Use Assessment.

[18D.500.060](#) Review Process.

[18D.500.070](#) Title, Plat, and Regulated Activities Notification.

[18D.500.080](#) Permitted Uses.

[18D.500.090](#) Appendices.

A. Property Adjacent to Resource Lands.

B. Agriculture Lands Noticing.

C. Mineral Resource Lands Noticing.

#### **18D.500.010 Purpose.**

This Chapter establishes requirements and regulations to protect natural resource lands and is established pursuant to [WAC 197-11-908](#) and [RCW 36.70A.170](#) and [36.70A.060](#). The City therefore designates agricultural lands and mineral resource lands and all associated buffers as natural resource lands. By regulating development, within, adjacent to or abutting natural resource lands, this Title seeks to implement the following goals and policies to:

- A. Inform the public of the existence, location and potential incompatibility impacts of development on, or adjacent to, these environmentally sensitive areas within the City.
- B. Encourage the retention of open space, development of recreational opportunities, conserve priority habitat, increase access to natural resource lands and water, and develop parks.
- C. Assure the conservation of resource lands and related activities by limiting encroachment of incompatible development thereon.
- D. Promote the conservation of mineral resource lands through inclusion of known deposits of minerals and materials.
- E. Assure that undeveloped mineral and material resources will not be forever lost by prior development of the land for other purposes.
- F. Allow for the necessary mineral processing to convert such minerals and materials into marketable products.
- G. Protect the environment and enhance the State's high quality of life, including air and water quality and the availability of water.
- H. Maintain and enhance the biological and physical functions and values of wetlands.

**18D.500.020 Intent.** Resource lands are of special concern to the citizens, the City, and the State. The intent of this chapter is to conserve resource lands by establishing standards for development of sites which contain, or are adjacent to, resource lands to promote the public health, safety, and welfare by:

- A. Noticing of property on, or within, natural resource land areas;
- B. Mitigating unavoidable impacts by regulating development;
- C. Protecting from development impacts;
- D. Protecting the public against losses from:

1. Costs of public emergency rescue and relief operations where the causes are avoidable;
2. Degradation of the natural environment and the expense associated with repair or replacement;
- E. Preventing adverse impacts on water availability, water quality, wetlands, and streams;
- F. Protecting unique, fragile, and valuable elements of the environment, including fish and wildlife habitat;
- G. Providing sufficient information to show that critical areas are adequately protected prior to approving, conditioning, or denying public or private development activity;
- H. Providing the public with sufficient information and notice of potential risks associated with development in critical and sensitive areas;
- I. Implementing the goals and requirements of the Growth Management Act, the State Environmental Policy Act, the City of Tenino Comprehensive Plan, and all updates and amendments, functional plans, and other land use policies formally adopted or accepted by the City.

**18D.500.030 Applicability.** This chapter shall apply to all properties designated as resource lands (Agricultural Lands or Mineral Resource Lands) or properties adjacent to designated resource lands within the City Tenino or adjacent to unincorporated land within Thurston County. When the requirements of this Title are more stringent than those of other local, State or Federal law, codes, or regulations, the requirements of this Title shall apply.

- A. **Agricultural Lands.** Lands that are not already characterized by urban growth that have long-term significance for the commercial production of food or other agricultural products. In addition to the classification criteria stated in WAC 365-190-050, agricultural lands Agricultural Lands are those lands meeting all of the following criteria:
  1. Lands in parcels which are ten acres or larger in size;
  2. Lands which are on prime or unique soils as identified in:
    - a. Soil Survey of Thurston County, Washington, Soil Conservation Service, United States Department of Agriculture (USDA), June 1990 or updated additions; or
    - b. Lands which are primarily devoted to the commercial production of horticultural, viticultural, floricultural, dairy, apiary, vegetable, or animal products or of berries, grain, hay, straw, turf, seed, Christmas trees not subject to the excise tax imposed by [RCW 84.33.100 through 84.33.140](#), or livestock, and which have long-term commercial significance for agricultural production;
    - c. Lands which are not adjacent to lots of record of one acre or less on more than 50 percent of the perimeter of the parcel; and
    - d. Are voluntarily placed in the program.
- B. **Mineral Resource Lands.** Lands that have long-term significance for the extraction of minerals.
  1. Any area under this Chapter presently operating under a valid Washington State Department of Natural Resources (DNR) surface mining permit.
  2. Any other area shall be classified Mineral Resource Lands when:
    - a. A surface mining permit is granted by the DNR; and
    - b. A Conditional Use Permit is granted pursuant to TMC 18.50.040, Conditional Use Permit, provided all of the additional criteria are met:
      - (1) The site does not contain prime agricultural soils;
      - (2) The site is not a registered or designated historic or archeological site; and
      - (3) The site is not within a shoreline of the State or have statewide significance designated Natural.

- C **Forest Resource Lands.** There are no forest resource lands within the current city limits of Tenino or the Urban Growth Area and forest resource lands are not anticipated to be designated in Tenino's jurisdictional limits in the future. However, if unincorporated County lands are designated forest resource lands in the future and are adjacent to lands within the City limits, the requirements of 18D.500.030D below will apply.
- D **Property adjacent to resource lands.** All plats, short plats, development permits, and building permits issued for development activities within 500 feet of lands designated as Natural Resource Lands by the City or in unincorporated County lands adjacent to lands under the jurisdiction of Tenino shall contain a notice that a variety of commercial activities may occur that are not compatible with residential development for certain periods of limited duration.

#### **18D.500.040 Natural Resource Lands Noticing Requirements.**

Pursuant to [RCW 36.70A.060](#), the City shall require that all plats, development applications, or permits issued for development activities on, abutting, or within 500 feet of lands designated as natural resource lands contain a notice (see Appendix A-C).

- A. **General.** If more than one natural resource land subject to the provisions of this Title intersects the subject parcel, then one notice addressing all of the natural resource areas shall be sufficient.
- B. **Title Notification.**
  - 1. When the City determines that activities not exempt from this Title are proposed, the owner shall file a notice with the Thurston County Auditor (Appendix A-C). The notice shall provide a public record of the presence of the sensitive area(s); the application of this Title to the property; and any limitations on activity in or affecting such sensitive area.
  - 2. The notice shall be notarized and recorded with the Thurston County Auditor before approval of any regulated use or activity on the site.
- C. **Plat Notification.** For all proposals requiring a plat within sensitive areas, the applicant shall note the face of the plat consistent with the language set forth in Appendices A-C.
- D. **Permit Notification.** The Department shall require that all permits issued for regulated activities within or adjacent to natural resource lands contain a notice as set forth in Appendices A-C.

**18D.500.050 Current use assessment.** Pursuant to 18D20.070 Current Use Assessment Program.

#### **18D.500.060 Review Process.**

- A. The Department shall review any permit or application requested for any regulated activity, including, but not limited to, those set forth in section 18D.500.010 on a site to determine if a site is adjacent to or abuts one or more of the resource lands identified above to ascertain the need of Title, Plat or Regulated Activities notification, unless otherwise provided in this Title.
- B. As part of all development applications:
  - 1. The Department shall review the information submitted by the applicant to:
    - a. Confirm the nature and type of the resource land and evaluate any required title, plat, and/or regulated activity notification;
    - b. Determine whether the development proposal is consistent with this Title; and
    - c. Determine whether any proposed alterations to the site containing resource lands are necessary.

- C. The City may approve, approve with conditions, or deny any development proposal in order to comply with the requirements and carry out the goals, purposes, objectives, and requirements of this Title.
- D. Approval of a development proposal does not discharge the obligation of the applicant to comply with the provisions of this Title.

**18D.500.070 Title, Plat, and Regulated Activities Notification.**

- A. If more than one resource land subject to the provisions of this Title exists on or adjacent to the site of application, then one notice that addresses all of the resource lands shall be sufficient.
- B. Notification shall be approved by the Department and shall be consistent with the forms set forth in Chapter 18D.130 Appendices A-C as applicable.
- C. Title notifications shall be notarized and recorded with the Thurston County Auditor prior to approval of any regulated use or activity for the site.

**18D.500.080 Permitted Uses.** Uses permitted on designated resource land sites shall be the same as those permitted in the zone classifications shown on the City zoning map.

**18D.500.090 Appendices.**

- A. [Property Adjacent to Resource Lands.](#)
- B. [Agriculture Lands Noticing.](#)
- C. [Mineral Resource Lands Noticing.](#)

**18D.500.090 Appendices.**

**APPENDIX A  
PROPERTY ADJACENT TO RESOURCE LANDS**

**A. TITLE NOTIFICATION**

Parcel Number: \_\_\_\_\_ Site Address: \_\_\_\_\_

**NOTICE:** This parcel lies within 500 feet of land designated Resource Lands by the City of Tenino or Thurston County. A variety of commercial and industrial activities occur in the area that may be inconvenient or cause discomfort to area residents. This may arise from the use of chemicals, or from spraying or extraction which occasionally generates dust, smoke, noise, and odor. The City has established resource uses as priority uses on productive resource lands, and residents of adjacent property should be prepared to accept such inconveniences or discomfort from normal, necessary commercial resource lands operations.

Signature of Owner \_\_\_\_\_  
(NOTARY ACKNOWLEDGMENT) \_\_\_\_\_

**B. PLAT NOTIFICATION.** The owner of any site within 500 feet of land designated as Resource Lands on which a large lot, short subdivision or formal subdivision is submitted, shall record a notice on the face of the plat. Such notification shall be in the form as set forth below:

**PROPERTY ADJACENT TO RESOURCE LANDS PLAT NOTIFICATION.** This property lies within 500 feet of land designated Resource Lands by the City of Tenino or Thurston County. A variety of commercial and industrial activities occur in the area that may be inconvenient or cause discomfort to area residents. This may arise from the use of chemicals, or from spraying or extraction which occasionally generates dust, smoke, noise, and odor. The City has established resource uses as priority uses on productive resource lands, and residents of adjacent property should be prepared to accept such inconveniences or discomfort from normal, necessary commercial resource lands operations.

**C. REGULATED ACTIVITIES NOTIFICATION.** The Department shall require that permits issued for regulated activities, as defined in section 18D.500, within 500 feet of lands designated as Resource Lands, contain a notice as set forth below.

**REGULATED ACTIVITIES NOTIFICATION.** This property lies within 500 feet of land designated Resource Lands by the City of Tenino or Thurston County. A variety of commercial and industrial activities occur in the area that may be inconvenient or cause discomfort to area residents. This may arise from the use of chemicals, or from spraying or extraction which occasionally generates dust, smoke, noise, and odor. The City has established resource uses as priority uses on productive resource lands, and residents of adjacent property should be prepared to accept such inconveniences or discomfort from normal, necessary commercial resource lands operations.

**18D.500.090 Appendices.**

**APPENDIX B  
AGRICULTURAL LANDS NOTICING**

**A. TITLE NOTIFICATION.**

Parcel Number: \_\_\_\_\_

Site Address: \_\_\_\_\_

**NOTICE:** This parcel lies within an area identified as Agricultural Lands by the City of Tenino or Thurston County. A variety of commercial agricultural activities occur in the area that may be inconvenient or cause discomfort to area residents. This may arise from the use of agricultural chemicals, including herbicides, pesticides, and fertilizers; or from spraying, pruning, and harvesting which occasionally generate dust, smoke, noise, and odor. Tenino has established agriculture as a priority use on productive Agricultural Lands, and residents of adjacent property should be prepared to accept such inconveniences or discomfort from normal, necessary farm operations.

Signature of Owner \_\_\_\_\_

Signature of Owner \_\_\_\_\_

(NOTARY ACKNOWLEDGMENT) \_\_\_\_\_

**B. PLAT NOTIFICATION.** The owner of any site within this designation on which a large lot, short subdivision, or formal subdivision is submitted, shall record a notice on the face of the plat. Such notification shall be in the form as set forth below.

**AGRICULTURAL LANDS PLAT NOTIFICATION.** This parcel lies within an area identified as Agricultural Lands by the City of Tenino or Thurston County. A variety of commercial agricultural activities occur in the area that may be inconvenient or cause discomfort to area residents. This may arise from the use of agricultural chemicals, including herbicides, pesticides, and fertilizers; or from spraying, pruning, and harvesting which occasionally generate dust, smoke, noise, and odor. The City has established agriculture as a priority use on productive Agricultural Lands, and residents of adjacent property should be prepared to accept such inconveniences or discomfort from normal, necessary farm operations.

**C. REGULATED ACTIVITIES NOTIFICATION.** The Department shall require that all permits issued for regulated activities, as defined in section 18D.500, within this zone classification contain a notice as set forth below.

**REGULATED ACTIVITIES NOTIFICATION.** This parcel lies within an area identified as Agricultural Lands by the City of Tenino or Thurston County. A variety of commercial agricultural activities occur in the area that may be inconvenient or cause discomfort to area residents. This may arise from the use of agricultural chemicals, including herbicides, pesticides, and fertilizers; or from spraying, pruning, and harvesting which occasionally generate dust, smoke, noise, and odor. The City has established agriculture as a priority use on productive Agricultural Lands, and residents of adjacent property should be prepared to accept such inconveniences or discomfort from normal, necessary farm operations.



**APPENDIX C  
MINERAL RESOURCE LANDS NOTICING**

**A. TITLE NOTIFICATION**

Parcel Number: \_\_\_\_\_

Site Address: \_\_\_\_\_

**NOTICE:** This parcel lies within an area of land designated Mineral Resource Lands by the City of Tenino or Thurston County. A variety of commercial mineral extraction activities occur in the area that may be inconvenient or cause discomfort to area residents. This may arise from the use of heavy equipment, chemicals, and spraying which may generate dust, smoke, and noise associated with the extraction of mineral resources. The City of Tenino has established mineral resource extraction as a priority use on productive Mineral Resource Lands, and residents of adjacent property should be prepared to accept such inconveniences or discomfort from normal, necessary mineral resource extraction operations.

Signature of Owner \_\_\_\_\_  
(NOTARY ACKNOWLEDGMENT) \_\_\_\_\_

**B. PLAT NOTIFICATION.** The owner of any site within this overlay district on which a large lot, short subdivision, or formal subdivision is submitted, shall record a notice on the face of the plat. Such notification shall be in the form as set forth below:

**MINERAL RESOURCE LANDS PLAT NOTIFICATION.** This property lies within an area of land designated Mineral Resource Lands by the City of Tenino or Thurston County. A variety of mineral resource extraction activities occur in the area that may be inconvenient or cause discomfort to area residents. This may arise from the use of heavy equipment, chemicals, and spraying which may generate dust, smoke, and noise associated with the extraction of mineral resources. The City of Tenino has established mineral resource extraction as a priority use on productive Mineral Resource Lands, and residents of adjacent property should be prepared to accept such inconveniences or discomfort from normal, necessary mineral resource extraction lands.

**C. REGULATED ACTIVITIES NOTIFICATION.** The Department shall require that all permits issued for regulated activities, as defined in section 18D.500, within this designation contain a notice as set forth below:

**REGULATED ACTIVITIES NOTIFICATION.** This property lies within an area of land designated Mineral Resource Lands by the City of Tenino or Thurston County. A variety of mineral resource extraction activities occur in the area that may be inconvenient or cause discomfort to area residents. This may arise from the use of chemicals and extraction of minerals, which occasionally generates dust, smoke, noise, and odor. The City has established mineral resource extraction as a priority use on productive Mineral Resource Lands, and residents of adjacent property should be prepared to accept such inconveniences or discomfort from normal, necessary mineral resource extraction lands.

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