

Chapter 24.35

SPECIAL REPORTS

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24.35.010 Purpose – Special reports.

The purpose of this chapter is to establish provisions governing the submittal requirements of special reports associated with development that impacts critical areas and/or their associated buffers.

24.35.012 Critical area report determination processes.

The sequence of review and determining whether critical area reports shall be required is described in TCC 24.05.027 and through the specific chapters of title 24.

24.35.015 Mitigation sequencing.

All proposals that require submittal of a mitigation plan due to impacts to a critical area or buffer shall employ the following sequence in order to reduce those impacts. Redesign, reconfiguration or relocation of a proposal to avoid impacts shall be preferable to submittal of a mitigation proposal. Mitigation actions associated with development proposals impacting critical areas shall adhere to the following mitigation sequence:

- A. Avoiding the impact altogether by not taking a certain action or parts of an action;
- B. 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;
- C. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- D. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;
- E. Compensating for the impact by replacing, enhancing, or providing substitute resources or environments; and/or
- F. Monitoring the impact and taking appropriate corrective measures.

24.35.017 Monitoring and contingency requirements.

- 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, undesirable vegetation, vandalism, damage due to wildlife grazing, grading errors, damage caused by erosion, settling, or other geomorphological processes, and hydro-regime problems. A financial guarantee shall be provided per chapter 24.70 TCC. Financial guarantees shall be based on an estimate submitted to the County detailing the work to be accomplished and the current cost.
- B. Requirements of monitoring programs 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 fish or wildlife biologist are to be submitted for department review. Monitoring reports generally will include discussions of wildlife utilization of the site, habitat structure establishment, water quality, and existing or potential degradation.
 3. Monitoring reports for wetland mitigation projects shall be prepared per the Monitoring Report Checklist in Appendix M of *Wetland Mitigation in Washington State, Part 2: Developing Mitigation Plans* (Version 1, Publication #06-06-011b, March 2006, as amended).
 4. For critical aquifer recharge areas, the approval authority may require water quality or quantity monitoring as a condition of approval and to document compliance with permit conditions. This may include establishment of baseline conditions for water quality and quantity. Said monitoring shall be performed by a qualified individual or entity, approved by the county. Monitoring may also be delegated to an appropriate county department and paid for by the applicant. The approval authority shall periodically review the need for continued monitoring and shall authorize termination of the monitoring if it is determined that it is no longer warranted.
 5. Monitoring may include, but is not limited to:
 - a. Evaluation of the project's status relative to the project's performance standards and goals in the approved mitigation plan.
 - b. Evaluation of vegetation plots to track changes in plant species composition and density over time;
 - c. Using photo stations to evaluate vegetation community response;
 - d. Sampling surface and subsurface waters to determine pollutant loading and changes from the natural variability of background conditions (e.g., pH, nutrients, heavy metals);

- e. Measuring base flow rates and stormwater runoff to model and evaluate water quality predictions, if appropriate;
 - f. Measuring sedimentation rates, if applicable;
 - g. Wildlife utilization of the site. If warranted, sampling fish and wildlife populations may be required to determine habitat utilization, species abundance and diversity;
 - h. Existing degradation; and
 - i. Hydric soil characteristics 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. The duration and extent of water on site can be approximated by periodic field visits to verify depth and extent of hydrology. Alternatively, continuous data loggers could be installed that monitor the hydroperiod.
6. Monitoring reports for mitigation projects specific to vegetative restoration or enhancement shall comply with the following:
- a. 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 (ten years for forested and scrub-shrub communities) and are to be submitted according to the following schedule:
 - i. At completion of construction of mitigation project (as-built report);
 - ii. Thirty days after completion;
 - iii. Early in the first growing season after construction;
 - iv. End of the first growing season after construction;
 - v. Twice the second year; and
 - vi. Once in years 3, 5, 7 and 10.
 - b. Deviation from this schedule may be allowed based upon project specific conditions.
7. Monitoring reports for mitigation projects whose goals are other than vegetative restoration or enhancement are to be submitted to the department for a period of time, and upon a schedule, appropriate for the species or habitat of concern. The specifics of such mitigation projects will be determined on a project by project basis.

- C. As a condition of approval for permits requiring monitoring, the County shall be provided the ability to enter property to verify monitoring reports and compliance with conditions of permit approval.
- D. Failures in the mitigation project shall be corrected as required by the County, such as, but not limited to:
 - 1. Replace dead or undesirable vegetation with appropriate plantings.
 - 2. Repair damage caused by erosion, settling, or other geomorphological processes.
 - 3. If necessary, redesign the mitigation project and implement the new design.
- E. Correction procedures shall be approved by the fish or wildlife biologist and the Director or designee.

24.35.020 Third party review.

Any submission made to the County as part of an application subject to this title may be subject to third party review, as outlined in TCC 24.05.022.

24.35.022 General qualifications for report preparers.

Special reports required by this chapter shall be prepared by professionals licensed, certified, or otherwise qualified to collect and analyze pertinent data and present a determination regarding the nature of a given critical area, its habitat value, threats posed to the critical area functions, threats posed to public safety, slope stability, or other relevant information, as determined by the director. Criteria for determining qualification are also found in specific sections of this chapter.

24.35.025 Critical aquifer recharge areas – Required reports.

Critical area review permits under chapter 24.40 TCC, where the underlying permit application requires a Type III review process (See chapter 20.60 TCC) within a CARA, shall provide the following special reports:

- A. Drainage and erosion control plan; and
- B. Hydrogeological report. In addition to the specific requirements for individual uses in chapter 24.10 TCC, the approval authority may require a hydrogeological report as part of other applications if:
 - 1. There is insufficient information regarding ground water to perform an adequate review to assure aquifer protection;
 - 2. The project is likely to possess, store, use, transport, or dispose of hazardous materials; or
 - 3. There is evidence of ground water degradation, or known ground water contamination, in the vicinity of the proposed project and the project would influence or be influenced by the water quality degradation. For example, where the identified quality degradation may render the proposed water source non-potable, or when the

proposed project may add to existing quality degradation in excess of 10% of the Assimilative Capacity standard (see TCC 24.10.030).

- C. The director may waive the hydrogeological report requirement or limit the scope of the report if the nature of the project and its impacts are generally known, or the impacts of the project have been mitigated by source control strategies.

24.35.030 Critical aquifer recharge areas – Special reports requirements.

Special report required in critical aquifer recharge areas shall include the following when relevant.

- A. Drainage and Erosion Control Plan. This plan shall address methods to minimize erosion and contain soil within the project boundaries during construction and to provide for stormwater management from the site and its surroundings during and after construction, consistent with the Drainage Design and Erosion Control Manual for Thurston County, as amended (chapter 15.05 TCC).
- B. Hydrogeological Report.
1. The hydrogeological report shall identify the proposed development plan and the risks associated with on-site septic systems and other on-site activities which may degrade the ground water beneath or down gradient from the site.
 2. The hydrogeological report shall be prepared by a licensed professional engineer or hydrogeologist, licensed in the State of Washington, qualified to analyze geological and hydrological information and ground water systems.
 3. The approval authority may waive the requirements of this section when there is persuasive evidence and reason that the issue(s) pertinent in a specific case, either site conditions or project mitigations, have been or can be adequately addressed in the technical report and supporting documentation.
 4. The hydrogeological report shall contain:
 - a. A description of the soil, geological and hydrological characteristics of the area under permit application consideration, including the relationships between ground water and surface water including stream flows and wetlands; the character of the unsaturated zone, the depth to groundwater and, if reasonably possible, direction of groundwater flow.
 - b. A site plan depicting the location of all existing and proposed structures; the boundaries of the property proposed to be developed; adjoining roads and site access; topography with 2-foot contours; the hydrogeologic context including water bodies, wetlands, springs, seeps, wells, ditches, culverts, stormwater facilities and other relevant features; and the location of all existing and proposed public and on-site utility structures and lines, including on-site sewage systems, sewer lines and water lines.
 - c. A discussion of how the characteristics described in subparagraph (a) above will influence drainage and the movement of water and contaminants in the

- ground water, and a discussion of how the proposed project will influence surface water including instream flows and wetlands;
- d. A description of conditions prior to project development, which may include baseline conditions for water quality and quantity;
 - e. A description of conditions as they are likely to exist after complete development of the proposed project, and their impact on ground water quality and quantity;
 - f. If determined to be necessary to evaluate the proposed activity or use, the approval authority may require the following information regarding the hydrogeologic characteristics of the site and the predicted behavior of contaminants: background water quality compiled over at least a one year period, contaminant transport modeling based on potential releases to ground water, and modeling to determine the effects of ground water withdrawals.
 - g. A list of those recommendations to be used to mitigate any of these potential ground water impacts. This shall include the effects of sewage disposal, lawn and yard activities, agricultural and animal husbandry, household chemical use, stormwater impacts and any other impacts reasonably associated with the project type described.
 - h. The post development description shall include the effects of the activities likely to occur as a result of the complete development and use of the project at final equilibrium.
5. Review and evaluation of the report may be delegated to other county departments and to qualified private consultants, at the applicant's expense, under the direction of the approval authority.
- C. Pier Foundations in critical aquifer recharge areas. The applicant shall submit the following information, certified by a qualified engineer, for foundations subject to review in accordance with TCC 24.10.170.
1. The proposed depth of the foundation below the ground surface.
 2. The depth to the aquifer that any well within two-hundred feet of the proposed foundation draws upon.
 3. If the aquifer drawn upon is less than fifty feet below the bottom of the hole proposed to be excavated to accommodate the foundation, then the applicant shall submit the following additional information.
 - a. The distance from the proposed foundation to the subject wells.
 - b. The foundation design and materials, including the concrete mix and the specific components of any additives, and the composition of any sealer/slurry proposed to be employed in construction of the foundation.

- c. Proposed construction techniques, such as use of a casing to mitigate potential groundwater contamination.

24.35.040 Critical aquifer recharge areas – Performance monitoring and reporting.

Monitoring requirements are established in TCC 24.35.017.

24.35.045 Critical aquifer recharge areas – Spill plan – Hazardous materials management plan.

Spill plans and hazardous materials management plans shall include, at a minimum, the following:

- A. A list of the locations, amounts, and types of hazardous materials/waste, stored on site;
- B. A description of inspection procedures for hazardous material storage areas and containers and the minimum inspection intervals. An inspection logbook shall be maintained for periodic review by the County;
- C. Provision of an appropriate spill kit with adequate spill supplies and protective clothing;
- D. Detailed spill cleanup and emergency response procedures identifying how the applicant will satisfy the requirements of the Dangerous Waste Regulations, chapter 173-303 WAC, in the event that hazardous material is released into the ground, ground water, or surface water;
- E. Procedures to report spills immediately to the Department of Ecology and the Environmental Health Division of the Thurston County Public Health and Social Services Department, in that order;
- F. A list of emergency phone numbers (e.g., the local fire district and ambulance);
- G. Procedures to ensure that all employees with access to locations where hazardous material are used or stored receive adequate spill training. A training logbook shall be maintained for periodic review by the County;
- H. Documentation of proper disposal, recycling, or onsite treatment of hazardous waste; and
- I. Additional information the approval authority determines to be necessary to demonstrate that the use or activity will not have an adverse impact on ground water quality.

24.35.050 Geologic hazards – Types of special reports.

The following special reporting requirements may apply to development proposals which contain a use or activity subject to Table 24.15-1 within a geologic hazard area and/or the associated buffer, as determined by the approval authority.

- A. Erosion hazard areas.
 - 1. Geological assessment.
 - 2. Drainage and erosion control plan.

3. Grading plan.
 4. Revegetation plan.
- B. Landslide hazard areas and marine bluff hazard areas.
1. Geological assessment.
 2. Drainage and erosion control plan.
 3. Grading plan.
 4. Revegetation plan.
 5. Structural mitigation plan.
- C. Mine hazard areas.
1. Geological assessment.
- D. Seismic hazard areas.
1. Geological assessment.

24.35.060 Geologic hazards – Waiver of special reports.

The director may waive the requirement for, or limit the scope of, any special reports upon a written finding in the Geological Assessment that the potential for landslide activity is low and that the proposed development would not cause significant adverse impacts, as determined by the director, or that there is adequate geological information available on the area proposed for development to determine the impacts of the proposed development and appropriate mitigating measures.

24.35.070 Geologic hazards – Minimum standards for special reports – Drainage and erosion control plan.

The Drainage and Erosion Control Plan shall comply with the requirements of the Drainage Design and Erosion Control Manual for Thurston County, as amended (chapter 15.05 TCC).

24.35.080 Geologic hazards – Minimum standards for special reports – Grading plan.

- A. The grading plan shall identify the proposed development project including the movement of material on-site along with the proposed and existing contours of the site and cross sections thereof.
- B. The grading plan shall be prepared by a registered design professional, as defined in TCC 14.37.020.
- C. The grading plan shall comply with the standards in chapter 14.37 TCC.

24.35.090 Geologic hazards – Minimum standards for special reports – Revegetation plan.

- A. The revegetation plan shall include a detailed site plan drawn to scale showing the placement of all plants to be used, the quantities of each species, distance on-center for planting, list of all species to be used with both botanical and common names, size of the nursery stock to be used, and any details for planting procedures including timing and maintenance. Once the revegetation plan has been installed, an as-built shall be submitted to the County that shows the results of the installation including any necessary modifications and reasons for those modifications.
- B. The revegetation plan shall be prepared by a person who is knowledgeable about regional soil and climatic conditions as well as native plant materials suitable for installation on or near an erosion, landslide, or marine bluff hazard area or associated buffers.
- C. The revegetation plan shall use a predominance of native, non invasive species, appropriate to the area. It shall document why the species chosen for the site will be appropriate, will function in the capacity as designed (i.e., soil and bluff stabilization, or runoff distribution), and will be likely to survive in the location with a minimum of maintenance once established.
- D. The approval authority may waive the requirement for the revegetation plan if it can be demonstrated that disturbance of the site is so minor that it will regenerate on its own within a reasonable time or that the size of the project does not necessitate such plan.

24.35.100 Geologic hazards – Minimum standards for special reports – Structural mitigation plan.

- A. The structural mitigation plan shall be prepared by a registered design professional, as defined in TCC 14.37, with demonstrated geotechnical experience, geologist, or engineering geologist licensed to practice in the State of Washington.
- B. The owner or agent shall provide for review, a minimum of two copies of a structural mitigation plan, including but not limited to, the following information:
 - 1. Project Information
 - a. Permit and/or application number,
 - b. Tax Parcel number,
 - c. Plan number or other identification of project.
 - 2. Registered Design Professional Information
 - a. Name, mailing address, and phone number of registered design professional,
 - b. Type of registration of the design professional,
 - c. Date the design was completed.

3. Project Site Plan Information
 - a. Existing and proposed topographic contours at 2 foot intervals,
 - b. Erosion control and drainage measures for the construction period and final disposition of the parcel,
 - c. Proposed slope stabilization methods consistent with chapter 24.15 TCC, if necessary.
4. Soils Investigation Report. The structural mitigation plan shall include a soils investigation report conforming to the provisions of the Thurston County Building Codes, as amended. The report shall include, but not be limited to, the following information:
 - a. A plot showing the location of test borings and/or excavations.
 - b. A complete record of the soil samples.
 - c. A record of the slope profile before and after construction drawn at an identifiable scale.
 - d. Elevation of the water table, if encountered.
 - e. Recommendations for foundation type and design criteria, including but not limited to: bearing capacity of natural or compacted soil; provisions to mitigate the effects of expansive soils; mitigation of the effects of liquefaction, differential settlement and varying soil strengths; and the effects of adjacent loads.
 - f. Expected total and differential settlement.
 - g. Pile and pier foundation information in accordance with TC building codes, as amended.
 - h. Special design and construction provisions for foundations located in adverse soils, as necessary.
 - i. Compacted fill material properties and testing in accordance with the TC building codes as amended.
5. Construction Drawings. Drawings submitted for review shall be annotated to call out and identify location of details, sections, and other specifics of the plan.
6. Details and Section Drawings. The registered design professional shall provide all details and sections needed to communicate the specific requirements of the structural mitigation plan to reviewers, inspectors, and field personnel responsible for installation of construction. All details and sections shall be clearly labeled.

7. **Materials and Specifications.** The registered design professional shall identify and provide specifications for all construction materials to be used.
8. **Method of Approval for Changes to Structural Mitigation Plan.** The registered design professional shall provide details of steps taken to review, submit, and approve changes.
9. **Special Inspections and Structural Observation Programs.** When applicable, the Building Official may require a P.E., Architect, or other qualified person to perform specific special inspections or structural observation programs.

24.35.120 Geologic hazards – Minimum standards for special reports – Flood elevation certificate.

- A. A Flood Elevation Certificate shall be required for a structure when a property lies within the one-hundred-year floodplain (flood hazard zone) of any river, lake, pond, wetland, or marine waters within Thurston County consistent with TCC 14.38.

24.35.130 Geologic hazards – Minimum standards for special reports – Geologic assessment.

A geologic assessment, as outlined below, shall be required when the Resource Stewardship Department's mapping, source documents, and/or field investigations indicate a proposed activity is located within or adjacent to an erosion, landslide, marine bluff, seismic, or mine hazard area.

- A. A geological assessment shall be submitted to the review authority for review and approval together with the appropriate permit application and associated fees.
- B. A geological assessment shall include a field investigation and may include review of available geologic hazard maps, historical air photo analysis, public records, and any other pertinent documentation, as required by the County.
- C. A geological assessment shall be prepared, signed, sealed, and dated by an appropriately licensed geotechnical professional, as defined in chapter 24.03 TCC and as applicable to the specific geologic hazard identified on or near the project site.
- D. A geological assessment shall be submitted in the form of a geotechnical letter, geotechnical evaluation, or geotechnical report, as determined in this chapter.
- E. After reviewing the geological assessment submitted by the applicant, the approval authority may request additional information or studies specific to the conditions of the development proposal site.
- F. 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. If any environmental surface or subsurface conditions associated with the site change during that five-year period, the applicant may be required to submit an amendment to the geological assessment.

- G. When a development has the potential to impact slope stability on, below, or above adjacent property, particularly where public health and safety are at risk, the geotechnical studies presented must comply with the guidelines defined as standard of practice under the Washington State Geology Licensing program, as presented in the Washington State Department of Licensing *"Guidelines for Preparing Engineering Geology Report in Washington"*, as amended. Such reports must include an assessment of each of the following parameters:
1. Slope gradient and existing slope stability conditions.
 2. Stratigraphy (affecting infiltration rates, transmissivity, and groundwater flow paths).
 3. Precipitation patterns (regional, seasonal and storm-related).
 4. Land cover (vegetation type and density as it affects water available for infiltration -- evapotranspiration and interception loss).
 5. Previous and proposed land use (affecting percent infiltration versus run-off).
 6. Specifically, a geologic assessment shall include analysis that addresses the following questions:
 - a. How will the project affect the stability of the slope?
 - b. What are the expected effects on groundwater levels during different seasons from development?
 - c. What specific mitigation actions will be used to minimize or avoid effects of the development?
 - d. What is the geologic/hydrologic basis for any proposed structural stabilization?
 - e. Do alternatives exist that would better protect the functions and values of the critical area?
- H. All geological assessments submitted under this chapter shall include the following information:
1. The dates when the geological assessment was conducted and when the assessment letter was prepared.
 2. The parcel number(s) of the subject property.
 3. Site address of the subject property.

4. The name, mailing address, and telephone number of the geotechnical professional who prepared the letter.
5. The name, mailing address, and telephone number of the property owner.
6. A description of the proposed project and the area to be developed.
7. A map showing the property lines for the site, existing two-foot contours of the existing topography, and the location of any existing structures, utilities, wells, stormwater or septic systems, or other development.
8. A site plan delineating the boundaries of the proposed development site and the location of all areas of the site subject to the potential geologic hazard, and if applicable, limits of associated buffers.
9. If a site plan is required pursuant to this title, the site plan shall be prepared at a scale of 1" = 50' (or other scale deemed appropriate by the Department). 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 geologic hazard area(s), including adjacent lots if necessary.
 - b. The location of any existing structures, utilities, on-site septic systems, wells, and stormwater management facilities.
 - c. The location of any 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 of the closest distance between the identified geologic hazard area boundary (and associated buffers, if applicable) and the proposed project area.
 - f. Existing contours on the site at two-foot intervals.
 - g. Property lines for the site.
 - h. North arrow and scale.
10. Detailed discussion of the technical information, best available science and site-specific data on which the determination of hazard was based, including background assumptions. References to any sources of best available science used shall be included.

11. A paragraph that states the following:
 - a. A statement that the assessment was prepared under the responsible charge of (Individual's Name) and that the individual meets the qualifications defined for a geotechnical professional in chapter 24.03 TCC to prepare a geological assessment for the specific type of geologic hazard.
 - b. A statement that a(n) (erosion, landslide, marine bluff, mine, or seismic) hazard geological assessment, including a field investigation, and research of available historic records, has been completed by the geotechnical professional on the subject site.
 - c. A statement that the scope of services completed for this project is adequate to meet the requirements of this title.
 - d. For geotechnical letters: A statement that it does not appear that a hazard area exists within the following areas adjacent to a development proposal.
 - i.) within 200 feet for erosion hazards areas;
 - ii.) within 300 feet for landslide, marine bluff, or mine hazard areas;
 - iii.) within the development proposal site for seismic hazard areas.
 - e. For geotechnical evaluations: A statement that it does not appear that a(n) (erosion, landslide, marine bluff, mine, or seismic) hazard area exists within 200 feet for erosion hazards areas; 300 feet for landslide, marine bluff, or mine hazard areas; within the proposed project area for seismic hazard areas of the proposed project area.
12. All geological assessments proposing infiltration or dispersion of storm water that are submitted under this chapter in relation to landslide and marine bluff hazards shall include the following additional information regarding the applicant's proposed solutions for handling storm water:
 - a. An estimate of the amount and percentage increase of added stormwater that will be infiltrated as a result of the proposed development, both during peak storm events and month-by-month over an average one-year period.
 - b. Detailed discussion of the science, site-specific data on which the estimate of infiltrated stormwater was based, including background assumptions regarding groundwater incorporated into analysis.
 - c. A professional estimate of where the added water is expected to flow under the ground, and where and in what volumes it will daylight on the slope or bluff during peak storm events.
 - d. Detailed discussion of the science and site-specific data on which the hypothesized stormwater flows were based, including background assumptions incorporated into the analysis.

- e. An analysis of whether the added stormwater daylighting the slope during peak storm events will increase the frequency, duration and severity of landslide events on the slope.
- f. Detailed discussion of the science and site-specific data on which the estimate of the landslide risk was made, including background assumptions incorporated into the analysis.
- g. A discussion of the alternative approaches to handling stormwater which were considered in the development process and discussion of why the proposed approach was chosen.
- h. A discussion of the long-term impacts of stormwater and other sources of added water due to development (e.g. onsite sewage treatment systems and underground springs altered by development).

24.35.140 Geologic hazards – Minimum standards for special reports – Third party review.

The approval authority may require a third party review of the geological assessment by a geotechnical professional at the applicant's expense.

- A. If a third party review is required, the approval authority will notify the applicant in writing of an intent to retain a qualified third-party to review the information provided by the applicant.
- B. At the time the applicant is notified of the requirement for third party review, the approval authority shall also provide written notice that the geotechnical report is available for review to property owners within one thousand (1,000) feet of the project site. The approval authority shall accept public comment during a 30 day period and shall forward the comments to the third party reviewer.
- C. Landslide and marine bluff hazard areas. The approval authority shall require third party review, at the applicant's expense, to assess the adequacy of the proposal and the cumulative impacts of stormwater infiltration on slope stability. This is accomplished by evaluating the applicant's proposal as well as previous geotechnical reports prepared for properties within one thousand (1,000) feet of the project site.

The approval authority may waive this requirement if the applicant demonstrates that the development proposal site is hydrologically disconnected to the landslide or marine bluff hazard area.

- D. Third party review – report requirements. Third party review reports submitted under this section shall include the following information:
 - 1. An analysis of the adequacy of methods used and the uncertainty and risk involved in the estimates.
 - 2. Review and comment on the applicant's proposed methods for handling stormwater.

3. In addition to paragraphs 1 and 2 above, third party review reports for landslide and marine bluff hazard areas shall include a thorough discussion of the cumulative stormwater impacts on the ground water flowing into the proposed development and the geologic hazard area from prior developments built or proposed to be built within one thousand (1,000) feet of the project site.
4. In light of these analyses, the third party reviewer shall answer the following question:
 - a. For landslide and marine bluff hazard areas: “In your professional opinion, does this development, as proposed, along with adjacent development within one thousand (1,000) feet, create a probable significant adverse impact from increased geological hazard risk.” If the answer is yes, the approval authority shall deny approval of the project, as proposed.
 - b. For seismic, volcanic, mine, or erosion hazard areas: “In your professional opinion, does the development, as proposed, create a probable significant adverse impact from increased geological hazard risk?” If the answer is yes, the approval authority will consider denial of the project, as proposed, based on the third party review findings.

24.35.150 Geologic hazards – Additional requirements for geologic assessments in erosion hazard areas.

In addition to the requirements in TCC 24.35.130, the following shall be required for geologic assessments in erosion hazard areas, as specified:

- A. The geological assessment shall be prepared by a geotechnical professional, such as an engineering geologist or geotechnical engineer, who is experienced and licensed to assess erosion hazard areas.
- B. The geological assessment shall be submitted in the form of a geotechnical letter when the geotechnical professional finds that no erosion hazard area exists within 200 feet of the development proposal site. A geotechnical letter shall, at a minimum, include the following:
 1. The letter shall be labeled identifying the submittal as an “Erosion Hazard Geotechnical Letter” and shall include all mandatory elements listed in TCC 24.35.130.
- C. The geological assessment shall be submitted in the form of a geotechnical evaluation when the geotechnical professional finds that an erosion hazard area exists, but is located more than 200 feet away from the proposed project area, and in their opinion, will not impact the subject site. A geotechnical evaluation shall, at a minimum, include the following:
 1. The cover letter for the document shall clearly identify the submittal as an “Erosion Hazard Geotechnical Evaluation” and shall include all mandatory elements listed in TCC 24.35.130.
 2. A site plan, as defined in TCC 24.35.130(H)(9).

- D. The geological assessment shall be submitted in the form of a geotechnical report when the geotechnical professional finds that 1) an erosion hazard area exists within 200 feet of the proposed project area or 2) an erosion hazard area is located more than 200 feet away from the proposed project area, but in their opinion, will impact the subject site. A geotechnical report shall, at a minimum, include the following:
1. The cover letter for the document shall clearly identify the submittal as an “Erosion Hazard Geotechnical Report” and shall include all mandatory elements listed in TCC 24.35.130.
 2. A description of the surface and subsurface geology, hydrology, soils, and vegetation on the site; conclusions and recommendations regarding the effect of geologic conditions on the proposed development; assessments and conclusions regarding the stability or instability of the site for the existing conditions and the developed conditions over the life of the project.
 3. A detailed description of any previous grading activity, soil instability, or slope failure.
 4. A site plan, as defined in TCC 24.35.130(H)(9).

24.35.160 Geologic hazards – Additional requirements for geologic assessments in landslide hazard areas.

In addition to the requirements in TCC 24.35.130, the following shall be required for geologic assessments in landslide hazard areas, as specified:

- A. The geological assessment for a landslide hazard area shall be prepared by a geotechnical professional who is licensed as a professional engineer or engineering geologist with a minimum of four years of relevant professional employment, as determined by the director.
- B. The geological assessment shall be submitted in the form of a geotechnical letter when the geotechnical professional finds that no landslide hazard area exists within 300 feet of the development proposal site. A geotechnical letter shall, at a minimum, include the following:
 1. The letter shall be labeled, identifying the submittal as a “Landslide Hazard Geotechnical Letter” and shall include all mandatory elements listed in TCC 24.35.130.
 2. The geotechnical letter shall be prepared under the responsible charge of a geotechnical professional(s) and be signed, sealed and dated by the geotechnical professional(s).
- C. The geological assessment shall be submitted in the form of a geotechnical evaluation when the geotechnical professional finds that a landslide hazard area exists, but is located more than 300 feet away from the proposed project area, and in their opinion, will not impact the subject site. A geotechnical evaluation shall, at a minimum, include the following:

1. The cover letter for the document shall clearly identify the submittal as a "Landslide Hazard Geotechnical Evaluation" and shall include all mandatory elements listed in TCC 24.35.130.
 2. A site plan, as defined in TCC 24.35.130(H)(9).
 3. A description of the surface and subsurface geology, hydrology, soils, and vegetation on the site, conclusions and recommendations regarding the effect of geologic conditions on the proposed development, the effect of the proposed development on geologic conditions, and opinions and recommendations on the stability or instability of the site over the life of the project.
- D. The geological assessment shall be submitted in the form of a geotechnical report when the geotechnical professional finds that 1) a landslide hazard area exists within 300 feet of the proposed project area; or 2) a landslide hazard area is located more than 300 feet away from the proposed project area, but in their opinion, will impact the subject site. A geotechnical report shall, at a minimum, include the following:
1. The cover letter for the document shall clearly identify the submittal as a "Landslide Hazard Geotechnical Report" and shall include all mandatory elements listed in TCC 24.35.130.
 2. A site plan, as defined in TCC 24.35.130(H)(9).
 3. A description of the surface and subsurface geology, hydrology, and soils on the site; a list of the landslide hazard indicators; conclusions and recommendations regarding the effect of geologic conditions on the proposed development and the effect of the proposed development on geologic conditions;
 4. Assessment of the role of existing vegetation on maintaining slope stability on site;
 5. Subsurface characterization data must be provided. The data shall be based on both existing and new information that may include soil borings (SPT or other appropriate driven sample collection methods), test pits, geophysical surveys, or other appropriate subsurface exploration methods, as approved by the director, development of site-specific soil and/or rock stratigraphy, and measurement of groundwater levels including variability resulting from seasonal changes, alterations to the site, and other factors as determined by the director.
 6. The geotechnical or boring data shall provide sufficient information for the geotechnical professional to determine slope stability. A written explanation shall be provided and include the logs outlining how the work was performed (equipment, company, drillers, etc.), weather, classification systems, and other information that incorporates all of the variables related to project performance.
 7. The soil classification shall meet the requirements of title 14 TCC, Buildings and Construction.

8. The three-dimensional subsurface conditions at the site shall be included in the report.
9. 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.
10. A detailed description of any prior grading activity, soil instability, or slope failure.
11. 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. Evaluation 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 as determined by the director. 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 title 14 TCC, Buildings and Construction.
 - 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.
12. Mitigation recommendations using engineered measures and any relevant best available science 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 required by the review authority.

- e. Soil compaction criteria and compaction inspection requirements.
- f. An analysis that indicates how the proposal meets the standards outlined in TCC 24.15.030-240.
- 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.

24.35.170 Geologic hazards – Additional requirements for geologic assessments in marine bluff hazard areas.

In addition to the requirements in 24.35.130 TCC, the following shall be required for geologic assessments in marine bluff hazard areas, as specified:

- A. The geological assessment for a marine bluff hazard area shall be prepared by a geotechnical professional who is licensed as a professional engineer or engineering geologist with a minimum of four years of relevant professional employment, as determined by the director.
- B. The geological assessment shall be submitted in the form of a geotechnical letter when the geotechnical professional finds that no marine bluff hazard area exists within 300 feet of the development proposal site (i.e. legal lot). A geotechnical letter shall, at a minimum, include the following:
 - 1. The letter shall be labeled, identifying the submittal as a “Marine Bluff Hazard Geotechnical Letter” and shall include all mandatory elements listed in 24.35.130 TCC.
 - 2. The geotechnical letter shall be prepared under the responsible charge of a geotechnical professional(s) and be signed, sealed and dated by the geotechnical professional(s).
- C. The geological assessment shall be submitted in the form of a geotechnical evaluation when the geotechnical professional finds that a marine bluff hazard area exists, but is located more than 300 feet away from the proposed development, and in their opinion, will not impact the subject site. A geotechnical evaluation shall, at a minimum, include the following:
 - 1. The cover letter for the document shall clearly identify the submittal as a “Marine Bluff Hazard Geotechnical Evaluation” and shall include all mandatory elements listed in 24.35.130 TCC.

2. A site plan, as defined in TCC 24.35.130(H)(9).
 3. A general description of the on-site geology and shoreline processes affecting the subject property as well as a detailed discussion of how the site could be developed without the use of a bulkhead along the shoreline.
 4. Assessments and conclusions of the stability or instability of the site including past slope failures if any, their timing, size, frequency, and mechanism; assessment of the likelihood of future failures, and identification of those aspects of the potential development that may contribute to future failures.
- D. The geological assessment shall be submitted in the form of a geotechnical report when the geotechnical professional finds that 1) a marine bluff hazard area exists within 300 feet of the proposed project area; or 2) a marine bluff hazard area is located more than 300 feet away from the proposed project area, but in their opinion, will impact the subject site. A geotechnical report shall, at a minimum, include the following:
1. The cover letter for the document shall clearly identify the submittal as a “Marine Bluff Hazard Geotechnical Report” and shall include all mandatory elements listed in 24.35.130 TCC.
 2. A site plan, as defined in TCC 24.35.130(H)(9).
 3. A description of the surface and subsurface geology, hydrology, and soils on the site, as well as a detailed discussion of how the site could be developed without the use of a bulkhead along the shoreline.
 4. Assessment of the role of existing vegetation on maintaining slope stability on site.
 5. Subsurface characterization data must be provided. The data shall be based on both existing and new information that may include soil borings (SPT or other appropriate driven sample collection methods), test pits, geophysical surveys, or other appropriate subsurface exploration methods, as approved by the director, development of site-specific soil and/or rock stratigraphy, and measurement of groundwater levels including variability resulting from seasonal changes, alterations to the site, and other factors as determined by the director.
 6. 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. Refer to requirements under TCC 24.35.160.
 7. Shoreline processes including an evaluation of erosion and bluff retreat over the past decade, and an estimate of probable rate of erosion over the useful life of the development (normally fifty years).
 8. A detailed description of any prior grading activity, soil instability, or slope failure.

9. 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. Evaluation of the potential types of landslide or bluff 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 title 14 TCC, Buildings and Construction.
 - c. An analysis of the 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.
10. Assessments and conclusions of the stability or instability of the site including past slope failures if any, their timing, size, frequency, and mechanism; assessment of the likelihood of future failures, and identification of those aspects of the potential development that may contribute to future failures.
11. Evaluation of site development alternatives that use nonstructural erosion control measures such as vegetation alone or in combination with rock at the toe of the marine bluff, beach berm, an earthen berm, logs anchored at the toe of the slope or beach nourishment.
12. 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 required by the review authority.

- e. Soil compaction criteria and compaction inspection requirements.
- f. An analysis that indicates how the proposal meets the standards outlined in TCC 24.15.030-240.
- 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.

24.35.180 Geologic hazards – Additional requirements for geologic assessments in mine hazard areas.

In addition to the requirements in chapter 24.18 TCC and TCC 24.35.130, the following shall be required for geologic assessments in mine hazard areas, as specified:

- A. The geological assessment for a mine hazard area shall be prepared by a geotechnical professional who is licensed as a professional engineer or engineering geologist with a minimum of four years of relevant professional employment, as determined by the director.
- B. The geological assessment shall be submitted in the form of a geotechnical letter when the geotechnical professional finds that no mine hazard area exists within 300 feet of the development proposal site. A geotechnical letter report shall, at a minimum, include the following:
 - 1. The letter shall be labeled, identifying the submittal as a “Mine Hazard Geotechnical Letter” and shall include all mandatory elements listed in TCC 24.35.130.
 - 2. The geotechnical letter shall be prepared under the responsible charge of a geotechnical professional(s) and be signed, sealed and dated by the geotechnical professional(s).
 - 3. A description of historical data and information required by chapter 24.18 TCC and other information used in the assessment.
- C. The geological assessment shall be submitted in the form of a geotechnical evaluation when the geotechnical professional finds that a mine hazard area exists, but is located more than 300 feet away from the proposed project area, and in their opinion, will not impact the subject site. A geotechnical evaluation report shall, at a minimum, include the following:

1. The cover letter for the document shall clearly identify the submittal as a “Mine Hazard Geotechnical Evaluation” and shall include all mandatory elements listed in TCC 24.35.130.
 2. A site plan, as defined in TCC 24.35.130(H)(9).
 3. A description of the surface and subsurface geology, hydrology, soils and vegetation of the site and a list of the mine hazard indicators found on or in the vicinity of the site.
 4. A summary of the results, conclusions, and recommendations resulting from the geological assessment of the mine hazards on or in the vicinity of the site.
 5. A summary of the data and methods of analysis used to support the conclusions and recommendations presented in the geotechnical evaluation.
 6. The review authority may waive the requirement for this report if it can be proven that the mine hazard no longer exists.
 7. The geotechnical evaluation shall be prepared under the responsible charge of a geotechnical professional(s) and be signed, sealed and dated by the geotechnical professional(s).
 8. A description of historical data and information required by chapter 24.18 TCC and other information used in the assessment.
- D. The geological assessment shall be submitted in the form of a geotechnical report when the geotechnical professional finds that a mine hazard area exists within 300 feet of the proposed project area or when the results of the site investigation by the geotechnical professional indicate that mitigation measures are necessary in order to construct or develop within a mine hazard area. A geotechnical report shall, at a minimum, include the following:
1. The cover letter for the document shall clearly identify the submittal as a “Mine Hazard Geotechnical Evaluation” and shall include all mandatory elements listed in TCC 24.35.130.
 2. A site plan, as defined in TCC 24.35.130(H)(9).
 3. A description of the surface and subsurface geology, hydrology, soils and vegetation of the site and a list of the mine hazard indicators found on or in the vicinity of the site.
 4. A description of the analytical tools and processes used to develop the geotechnical report.
 5. A detailed description of any prior grading activity, soil instability, or ground failure.

6. Data from surface exploration such as borings, drill holes, test pits, wells, geologic reports, and other relevant reports or site investigations that may be useful in making conclusions or recommendations about the site under investigation.
7. A description of historical data and information required by chapter 24.18 TCC and other information used in the evaluation, together with sources, to include:
 - a. Topographic maps at a scale and contour interval of sufficient detail to assess the site. The site boundaries and proposed development site shall be overlain with the mine plan view map.
 - b. Aerial photography, as appropriate.
 - c. Geologic cross-sections and other illustrative data, as appropriate.
8. A summary of the results, conclusions, and recommendations resulting from the geological assessment of the mine hazards on or in the vicinity of the site.
9. The review authority may waive the requirement for this report if it can be proven that the mine hazard no longer exists.
10. The geotechnical report shall be prepared under the responsible charge of a geotechnical professional(s) and be signed, sealed and dated by the geotechnical professional(s).

24.35.190 Geologic hazards – Additional requirements for geologic assessments in seismic hazard areas.

In addition to the requirements in TCC 24.35.130, the following shall be required for geologic assessments in seismic hazard areas, as specified:

- A. The geological assessment for a seismic hazard area shall be prepared by a team that includes a geotechnical professional who is licensed as an engineering geologist specializing in seismic hazards with a minimum of four years of relevant professional employment, as determined by the director.
- B. The geological assessment shall be submitted in the form of a geotechnical letter when the geotechnical professional finds that no seismic hazard areas exist within the development proposal site. A geotechnical letter shall, at a minimum, include the following:
 1. The letter shall be labeled identifying the submittal as a “Seismic Hazard Geotechnical Letter” and shall include all mandatory elements listed in TCC 24.35.130.
 2. The geotechnical letter shall be prepared under the responsible charge of a geotechnical professional(s) and be signed, sealed and dated by the geotechnical professional(s).
- C. The geological assessment shall be submitted in the form of a geotechnical evaluation when the geotechnical professional finds that a seismic hazard area exists but is located outside the

proposed project area. A geotechnical evaluation shall, at a minimum, include the following:

1. The cover letter for the document shall clearly identify the submittal as a "Seismic Hazard Geotechnical Evaluation" and shall include all mandatory elements listed in TCC 24.35.130.
 2. A site plan, as defined in TCC 24.35.130(H)(9).
 3. Verification that a seismic hazard exists on the property, but is located outside the proposed project site.
 4. A description of the geology of the site, conclusions and recommendations regarding the effect of geologic conditions on the proposed development, and opinions and recommendations for compensating for the seismic hazards present.
 5. The geotechnical evaluation shall be prepared under the responsible charge of a geotechnical professional(s) and be signed, sealed and dated by the geotechnical professional(s).
- D. The geological assessment shall be submitted in the form of a geotechnical report when the geotechnical professional finds that a seismic hazard area exists within the proposed project area. A geotechnical report shall, at a minimum, include the following:
1. The cover letter for the document shall clearly identify the submittal as a "Seismic Hazard Geotechnical Report" and shall include all mandatory elements listed in TCC 24.35.130.
 2. A site plan, as defined in TCC 24.35.130(H)(9). The site plan shall also include any set-backs from the defined locations of the seismic hazard area, as determined by the geotechnical professional(s), to protect any portion of the proposed development activity from damage caused by liquefaction-induced ground displacement.
 3. Verification that the proposed project site falls within a seismic hazard area.
 4. The field investigation shall include subsurface characterization using conventional geotechnical borings and Standard Penetration Testing (SPT) or using Cone Penetration Testing (CPT).
 5. The geotechnical report shall include a detailed assessment of the liquefaction and/or dynamic settlement hazard based on an analysis of all available SPT or CPT data using state-of-the-practice methodologies, such as provided by 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.
 6. 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.

7. Alternative mitigation 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. 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 post-treatment verification testing shall be provided on a site map at the same scale as required by the approval authority.
8. A description of the geology of the site, conclusions and recommendations regarding the effect of geologic conditions on the proposed development, and opinions and recommendations for compensating for the seismic hazards present.
9. The geotechnical report shall be prepared under the responsible charge of a geotechnical professional(s) and be signed, sealed and dated by the geotechnical professional(s).

24.35.200 Frequently flooded areas – Special reports.

The following special reports are required for uses and activities proposed to be located within flood or channel migration hazard areas, including the NDZ and RDZ associated with high ground water hazard areas: drainage and erosion control plan; topographic survey of the site plan; and flood elevation certificate from a licenced surveyor. If the subject site contains a channel migration zone identified pursuant to TCC 24.20.045 and .055, the applicant shall submit a 100-year channel migration hazard area report.

24.35.210 Frequently flooded areas – Drainage and erosion control plan.

The applicant shall submit a Drainage and Erosion Control Plan which addresses methods to minimize erosion and contain soil within the project boundaries during construction and to provide for stormwater management from the site and its surroundings during and after construction, consistent with the Drainage Design and Erosion Control Manual for Thurston County, as amended (chapter 15.05 TCC).

24.35.220 Frequently flooded areas – Grading plan.

- A. An applicant shall submit a grading plan which identifies the proposed development project including the movement of material on-site along with the proposed and existing contours of the site, and cross sections thereof.
- B. This report shall be prepared by a civil engineer licensed in the state of Washington, consistent with title 14 TCC.

24.35.230 Frequently flooded areas – Topographic survey.

- A. An applicant shall submit a topographic survey when development on the subject property lies within the 100-year floodplain of any river, lake, wetland or marine waters within Thurston County pursuant to chapter 14.38 TCC, as amended; or within a high ground water hazard area/NDZ/RDZ; or in a 100-year channel migration hazard area. The survey shall indicate the 100-year floodplain elevation above mean sea level of the site or BFE, as applicable (see chapter 24.03 and TCC 24.20.015) and the location and first floor elevation of any proposed structures as required by TCC 14.38, as amended or above the BFE consistent with TCC 24.20.015-035.
- B. Where elevation data is not available from the Flood Insurance Rate Maps a licensed surveyor shall establish an approximate flood elevation based upon other sources of information as described in TCC 14.38.040, as amended.

24.35.240 Frequently flooded areas – Channel migration hazard area report.

If the approval authority determines that a proposed project is in an historic channel migration zone of a Type S or F stream and the 100-year channel migration hazard area has not been mapped for the site, the applicant shall identify the location of the 100-year channel migration hazard area on the site as follows:

- A. A determination as to whether the 100-year channel migration hazard area is located on site and, if so, the extent of its location, shall be made by a qualified professional proficient in fluvial geomorphology (e.g., possess a graduate degree in Geology or Physical Geography with specialization in fluvial geomorphology, and have at least two years of professional experience) using a reliable methodology to determine channel migration accepted by the Resource Stewardship Department (e.g., as described in Forest Practices Board Manual, Standard Methods for identifying Channel Migration Zones and Bankfull Channel Features, dated 8/2001, as amended, or as described in “A Framework for Delineating Channel Migration Zones,” Washington Department of Ecology, 2003 as amended). Maps delineating the 100-year channel migration zone shall be of a scale and format specified by the Department.
- B. The following areas shall be considered outside of the 100-year channel migration hazard area:
 1. Areas separated from the stream channel by a legally established structure that the approval authority, in consultation with a qualified professional, determines will block channel migration. This may include, but is not limited to, dikes and public roads that extend above the 100-year flood elevation which are constructed to remain intact through a 100-year flood. Constraints to channel migration that do not extend above the 100-year flood elevation shall not be considered to limit channel migration unless demonstrated otherwise based on scientific and technical information; and
 2. Areas separated from the stream channel by a natural geologic feature, such as a rock outcrop, that the approval authority, in consultation with a qualified professional, determines will stop channel migration.

24.35.250 Fish and wildlife habitat conservation areas – Special reports.

Applications for development proposals on property containing an important species or habitat shall provide: a critical area report; a drainage and erosion control plan; and a grading plan as indicated in this chapter. Applications for development proposals that are within 600 feet of a point location of an important species may be required to submit special reports described in this chapter if the approval authority determines that the project location and nature may have an impact on an important species. If restoration is proposed in exchange for reduced habitat area width, the applicant shall submit a habitat restoration plan consistent with TCC 24.35.310.

24.35.260 Fish and wildlife habitat conservation areas – Critical area reports required.

All applications for projects requiring a Critical Area Review Permit (see chapter 24.40 TCC) on sites containing important habitats and species areas or associated buffers shall include a critical area report as specified in this section. The critical area report for important habitats and species may also be referred to as a habitat management plan. If the use or activity is proposed to be located within an important habitat area or an associated buffer, a mitigation plan shall also be submitted.

- A. Critical area reports shall be prepared by a qualified professional biologist with experience preparing reports for the relevant species or type of habitat. The report shall be prepared in consultation with staff from the appropriate state agency, such as WDFW or DNR.
- B. The approval authority shall verify compliance with the applicable standards contained in chapters 24.01, 24.25, 24.65 TCC, and 24.70, prior to authorizing the proposed use or activity.
- C. All proposals for land development activities, including land clearing, on a prairie soil type shown in Table 24.25-6 (chapter 24.25 TCC), or in an area that could be classified as a prairie or oak habitat under this Chapter, or are within six hundred feet of those habitats, shall be subject to the requirements of this chapter, except where one of the following conditions exist:
 1. Proposals for which there is no expansion of the structural footprint of an existing structure, or where there is no change in the location and area of existing impervious surfaces; or
 2. Minor road and street improvements (refer to WAC 197-11-800(2)(c)); or
 3. Developed parcels less than one (1) acre in size for which an accessory structure or an addition to the primary structure is proposed, and which are surrounded by similarly sized and similarly developed lots, where developed means the presence of a primary structure(s), with associated paving, lawns, or non-native landscaping; or
 4. New development is proposed on vacant parcels less than one half (0.5) acre in size surrounded by similar sized developed lots, where developed means the presence of a primary structure(s), with associated paving, lawns or non-native landscaping.

For the purposes of this section, a structure shall not include sheds, agriculture buildings, buildings less than two-hundred (200) square feet, or similar structures as determined by the approval authority.

24.35.270 Fish and wildlife habitat conservation areas – Waiver of special reports.

The director may waive the submittal of any and all of the fish and wildlife habitat conservation areas special reporting requirements identified in this chapter under the following conditions:

- A. The removal of vegetation is minimal and will not impact the values or functions of an important habitat area or associated buffer;
- B. Project activities will not impact the values or functions of an important habitat area or associated buffer; and
- C. In the judgment of the director, any waived special reporting requirements would not be required to adequately address the potential critical area impacts and required mitigation.

24.35.280 Fish and wildlife habitat conservation areas – Critical Area Reports – Minor Projects.

- A. A Critical Area Report for Minor Projects shall be submitted for:
 - 1. Small scale projects with less than 5,000 square feet of impervious surface that will not encroach into an important habitat area or associated buffer; and
 - 2. Other projects on sites containing important habitat areas where all of the proposed development would be located at least 400 feet from all important habitat areas, as verified in the field. This does not include priority species conservation areas or intensive uses identified in TCC 24.25.220.
- B. Applicants for projects that do not qualify under this section must comply with TCC 24.35.290.
- C. The Critical Area Report for Minor Projects shall contain the following information, as applicable:
 - 1. The applicant's name, address, and contact information;
 - 2. The name, contact information, and qualifications of the report's primary author;
 - 3. The site address and tax parcel number;
 - 4. A vicinity map with driving directions;
 - 5. A site map including:
 - i. A north arrow;
 - ii. Scale;

- iii. The approximate location of the important habitat area on site and an approximate delineation of the other critical areas and associated buffers onsite and within 300 feet of the site;
 - iv. Topographic contours at two-foot intervals;
 - v. Existing physical features, including, but not limited to, buildings, fences and other structures, roads, parking lots, utilities, and water bodies, etc.;
 - vi. Property lines, rights-of-way, and easements; and
 - vii. The location of the proposed activity or use, including proposed structures, grading and clearing limits, and any other site development and modifications.
6. Text outlining, as applicable:
- i. Site acreage and general site characteristics; and
 - ii. A description of the proposal.
- D. Based on the quality and detail of information provided, the site's complexity or the use's potential to impact important habitat areas or associated buffers, the approval authority may require additional information listed in TCC 24.35.290 as necessary to make a decision regarding the proposal.

24.35.290 Fish and wildlife habitat conservation areas – Requirements for critical area reports.

Applicants for projects that do not qualify for a Critical Area Report-Minor Projects shall submit a report and accompanying plan/data sheets containing, at a minimum, the relevant information specified in this section.

- A. Maps. The report shall contain a vicinity map with detailed driving instructions to the subject site and site map setting forth the following, as applicable:
- 1. A north arrow and scale;
 - 2. The location of important habitat areas and any marine or riparian management zones on-site, the point location of an important species within 600 feet of the development proposal site, and other critical areas that extend onto the property proposed for development and within 300 feet of the project area. The important habitat areas and any established and proposed buffers shall be staked and flagged in the field. A professional land surveyor shall survey the boundary of the important habitat area or, if applicable, associated buffer after the approval authority has determined that it is located correctly. The habitat area and management zone delineations shall be submitted to the approval authority in a format acceptable to the Resource Stewardship Department.
 - 3. Property lines, rights-of-way, and easements;

4. Topographic contours at two-foot intervals;
 5. Patterns of surface water movement and, if relevant (e.g., for streams, lakes, ponds, Puget Sound, and riparian habitats), known subsurface water movement into, through, and out of the site;
 6. All existing physical features including, but not limited to, buildings, fences and other structures, roads, parking lots, utilities, and water bodies;
 7. A depiction of the proposed activity or use and other proposed modifications to the site including the grading and clearing limits and proposed stormwater management facilities.
- B. The important habitat area, associated buffer, and any management zone boundary shall be identified on all grading, landscaping, site, utility or other development plans submitted for the project.
- C. Text. The report shall contain the following information, as applicable:
1. The applicant's name and contact information;
 2. The name, contact information, and qualifications for the primary report author(s);
 3. The site address and tax parcel number;
 4. A description of the proposal;
 5. Identification of all the local, state, and federal permit(s) required for the project;
 6. Assessment of existing conditions including, as relevant, vegetative types and complexity, hydrology, soil conditions, general site conditions, acreage and identification and characterization of the important wildlife habitat and any other critical areas onsite;
 7. If a stream, Puget Sound, pond or lake is affected, a hydrological analysis, including existing surface and known significant sub-surface flows into and out of the important habitat area;
 8. Identification of the important habitat area's functions and documentation of fieldwork and literature reviewed pertaining to functional assessments;
 9. An analysis of site development alternatives and a discussion of measures proposed to avoid impacts and preserve the important habitat area/buffer and associated functions; and
 10. A description of the nature and extent of the proposed use or activity's potential direct or indirect impacts to the important habitat area and associated buffer,

including a description of impacted vegetation, hydrology, soil conditions, and other relevant factors.

24.35.300 Fish and wildlife habitat conservation areas – Requirements for mitigation plans.

If important habitat areas or associated buffers would be impacted, a mitigation plan shall be submitted with the critical area report. The mitigation plan shall identify proposed measures to avoid, minimize and mitigate the proposed project's impacts to the important habitat areas and associated buffers. The mitigation plan shall include, as applicable:

- A. Mitigation proposal. The general mitigation scheme and justification that provides for restoration or mitigation of the projects impacts, approximate project sequencing and schedule, proposed plant selection, and maintenance program;
- B. Performance standards. Performance standards for evaluating whether or not mitigation is successful. These standards shall address all of the relevant habitat functions being mitigated including, but not limited to, water quality, habitat diversity, establishment of viable plant communities, vegetative complexity, and vegetative survival rates;
- C. Monitoring and contingency measures. Proposed monitoring and contingency measures shall be provided per TCC 24.35.017.

24.35.310 Fish and wildlife habitat conservation areas – Requirements for restoration plans.

Habitat restoration plans shall be prepared by a qualified biologist or other qualified professional and shall identify all measures needed to improve the habitat functions. Priority and locally important habitats and species, if present, shall be addressed in the plan. The restoration plan shall be prepared, consistent with best available science, by the applicant's qualified biologist. Restoration measures shall include, as applicable, but are not limited to, the following:

- A. Planting a mix of conifers and other native trees in degraded riparian habitat areas that will provide structural diversity and a source of large woody debris (e.g., fallen trees) for the stream, marine areas, and productive upland habitat. The trees shall be appropriate to the habitat, field grown, at least two feet in height, and planted between October 1 and April 1. The applicant shall provide a watering plan indicating how the trees will be watered during the first two years following planting to ensure survival.
- B. Replacing invasive or nonnative plant species with native vegetation that occurs in the habitat.
- C. Replacing rip-rap, concrete, tires or similar stream bank armoring along a Type F or S stream with anchored logs or another appropriate form of bioengineering consistent with the latest edition of WDFW's Integrated Stream bank Protection Guidelines. (Also see chapter 24.20 TCC, Frequently Flooded Areas).
- D. Planting vegetation appropriate and consistent with the surrounding habitat to increase root density along stream banks that are eroding or are vulnerable to erosion, as determined by the approval authority. Unless otherwise recommended by a qualified professional, such vegetation shall be planted between October 1 and April 1. The applicant shall provide a

watering plan indicating how the plants will be watered during the first two years following planting to ensure survival.

- E. Off channel habitat restoration or enhancement (e.g., sloughs) that significantly improves the productivity of a stream section.
- F. Installing rot free, slow decomposing tree trunks with root balls (e.g., red cedar, Douglas fir, big leaf maple) and/or large rocks in appropriate locations in Type F or S streams that lack such structure, as determined by the approval authority in consultation with the WDFW and others with expertise. The approval authority may require that a qualified engineer review the proposal to assure that it will function as intended without exacerbating flooding risks. Also see chapter 24.20 TCC, Frequently Flooded Areas.

Unless otherwise recommended by a qualified professional consistent with best available science, logs placed in streams between 16 and 32 feet wide shall be at least 22 inches in diameter. Trees placed in streams wider than 32 feet shall be at least 26 inches in diameter.

Large woody debris shall not be installed in the following locations unless it is anchored:

1. Streams that have a history or high potential for debris torrents or other mass wasting;
2. Within 50 feet upstream from culverts or bridges;
3. Confined streams where the width of the valley floor is less than twice the bankfull width;
4. In areas that have a known history of log jams that threaten structures or roads.

(For guidance on tree selection and placement, see the Forest Practices Board Manual, Section 26, dated August 2001, Guidelines for Large Woody Debris Placement Strategies, as amended).

- G. Removal of roads within the habitat area and revegetation of the roadbeds with appropriate native vegetation. The approval authority may require soil amendment to enable plant survival and drainage in restored roadbeds.
- H. Removal of structures within the habitat area and revegetation of the building sites with appropriate native vegetation. The approval authority may require soil amendment on the compacted building site to enable plant survival and drainage.
- I. Removal or replacement of culverts or facilities that are a barrier to fish migration.
- J. Elimination of channels and ditches in a habitat area or buffer that convey stormwater to a waterbody and installation of a device (e.g., a perforated pipe) to induce sheet flow of stormwater at the outer edge of the habitat area or buffer, as applicable.
- K. Planting native vegetation appropriate and consistent with the surrounding habitat in degraded habitat areas that will provide structural diversity for the habitat and associated

species. The plants shall be appropriate to the habitat, native to the area and planted between October 1 and April 1. The applicant shall provide a watering plan indicating how the plants will be watered during the first two years following planting to ensure survival.

24.35.320 Fish and wildlife habitat conservation areas – Requirements for drainage and erosion control plans.

The applicant shall submit a Drainage and Erosion Control Plan that addresses methods to minimize erosion and contain soil within the project boundaries during construction. The plan shall also provide for stormwater management from the site and its surroundings during and after construction consistent with the chapter 17.15 TCC, Drainage Design and Erosion Control Manual for Thurston County, as amended (chapter 15.05 TCC).

24.35.330 Fish and wildlife habitat conservation areas – Requirements for grading plans.

The applicant shall submit a Grading Plan. This plan shall identify the proposed development project including the movement of material on-site along with the proposed and existing contours of the site, and cross sections thereof. The report shall be prepared by a civil engineer licensed in the state of Washington, consistent with chapter 14.37 TCC.

24.35.340 Wetlands – Length of wetland report validity.

Wetland reports shall be valid for a period of five years, or the duration of the underlying permit. This excludes subdivisions, which are regulated under title 18 TCC and chapter 58.17 RCW. A wetland report may be submitted for other types of permits if the report is less than five years old. The approval authority may require the wetland report to be updated if site conditions or regulatory requirements have changed.

24.35.350 Wetlands – Special reports.

A wetland critical area report is required as part of the application for projects proposed to be located on sites containing wetlands and/or associated buffers. If the use or activity is proposed to be located within a wetland or buffer, the applicant shall also submit a wetland mitigation plan (see TCC 24.35.380). The director may waive, or limit the scope of, any special reports with a written finding that the potential for wetland or buffer impacts are low and that the proposed development would not cause significant adverse impacts, or that there is adequate biological/ecological information available on the area proposed for development to determine the impacts of the proposed development and appropriate mitigating measures.

24.35.360 Wetlands – Critical area report – Minor projects.

- A. A wetland Critical Area Report - Minor Projects shall be submitted for:
1. Projects with less than 5,000 square feet of impervious surfaces that will not encroach into a wetland or buffer; and
 2. Other projects on sites containing wetlands or buffers where all of the proposed development would be located at least 400 feet from all wetlands, as verified in the field. This does not include intensive uses identified in TCC 24.30.200.
- B. Applicants for projects exceeding the size limits in this section, involving intensive uses, or all projects that would encroach upon a wetland or associated buffer must comply with TCC 24.35.370.

- C. The wetland Critical Area Report - Minor Projects shall contain the following information as applicable:
1. The applicant's name and contact information.
 2. The submitting wetland scientist's name, contact information, and qualifications.
 3. The site address and tax parcel number.
 4. A vicinity map with driving directions.
 5. A site map including:
 - a. A north arrow and scale;
 - b. For projects at least 400 feet from a wetland: The wetland's category, if known, and its approximate location and the approximate location of other critical areas and their buffers onsite and within 300 feet offsite;
 - c. For projects within 400 feet of a wetland: identification of the wetland's category, delineation of the wetland boundary and the recommended buffer consistent with Ecology's Wetland Rating System for Western Washington;
 - d. Topographic contours at two-foot intervals;
 - e. All existing physical features, including, but not limited to, buildings, fences and other structures, roads, parking lots, utilities, and water bodies;
 - f. Property lines, rights-of-way, and easements; and
 - g. The location of the proposed activity or use, including proposed structures, grading and clearing limits, and any other site modifications.
 6. Text outlining:
 - a. Site acreage and general characteristics;
 - b. A description of the proposal;
 - c. For projects within 400 feet of a wetland: the wetland's hydrogeomorphic class, category, and function scores consistent with Ecology's Wetland Rating System for Western Washington; and the proposed wetland buffer and reasoning; and
 - d. A description of the wetland review process including when field work was conducted, data that was used, and general observations.

- D. Based on the quality and detail of information provided, the site's complexity or the use's potential to impact wetlands and buffers, the approval authority may require additional information listed in TCC 24.35.370 as necessary to make a decision regarding the proposal.

24.35.370 Wetlands – Critical area report.

Applicants for projects that do not qualify under TCC 24.35.360 shall submit a report and accompanying plan/data sheets containing, at a minimum, the information specified in this section.

- A. Preparation by a qualified professional. Certified professional wetland scientists or non-certified professional wetland scientists with a minimum of five years experience in the field of wetland science, including experience preparing wetland reports, shall prepare wetland critical area reports. The wetland report shall be signed and dated by the primary author.
- B. Maps. The report shall contain a vicinity map with detailed driving instructions to the subject site and site map setting forth the following, as applicable:
1. A north arrow and scale;
 2. Property lines, rights-of-way, and easements;
 3. All existing physical features including, but not limited to, buildings, fences and other structures, roads, parking lots, utilities, and water bodies;
 4. The location of wetlands and associated buffers on-site, consistent with TCC 24.30.020. The wetland boundaries shall be staked and flagged. A professional land surveyor shall survey the wetland boundary after the approval authority has determined that it is located correctly. The final wetland and buffer delineations shall be submitted to the approval authority in a format acceptable to the Resource Stewardship Department;
 5. Wetlands and buffers offsite within 300 feet of the site boundaries in as much detail as possible;
 6. Topographic contours at two-foot intervals;
 7. Patterns and direction of surface water movement and known subsurface water movement into, through, and out of the site;
 8. A depiction of the proposed activity or use and other proposed modifications to the site, including grading and clearing limits and proposed stormwater management facilities, including outlets;
 9. Identification of areas where proposed impacts to the wetland and buffer would occur, the size of the impacted wetland and buffer in square feet, and discussion of potential impacts, including any anticipated hydro period alterations;

10. The wetland boundary, wetland buffer, and all critical area tracts and easements on the subject site shall be identified on all grading, landscaping, site, utility or other development plans submitted for the project.

C. Text. The report shall contain the following information, as applicable:

1. The applicant's name and contact information;
2. The name, qualifications, and contact information for the primary report author(s);
3. A description of the proposal;
4. Identification of all the local, state, and federal wetland related permit(s) required for the project;
5. The site address and tax parcel number;
6. General site conditions and size;
7. Identification and characterization of all wetlands and buffers onsite and within 300 feet of the site proposed for development. If the affected property owner does not grant access to the area within 300 feet of the project site, the wetland scientist shall estimate the site conditions using the best available information;
8. For each wetland on-site, the wetland's hydrogeomorphic classification, category, and function scores, consistent with the Wetland Rating System for Western Washington, the recommended wetland buffer, consistent with TCC 24.30.035-065, and the rationale;
9. Documentation of any fieldwork performed on the site such as field data sheets for delineations and functional assessments;
10. A hydrological analysis, including existing surface and known sub-surface flows into and out of the subject wetland(s), the location and condition of inlet/outlets (if they can be legally accessed), estimated water depths within the wetland, and estimated hydroperiod patterns based on visual cues such as algal mats, drift lines, and flood debris;
11. Identification and evaluation of all wetland and buffer functions at the subject site (e.g., removing sediment, excess nutrients and pollutants from water; storing floodwater; moderation of stormwater impacts; providing cover, refuge, foraging and breeding habitat for fish and wildlife; sustaining sensitive plant species; and providing shade that moderates water temperature and produces micro-climate effects), consistent with Ecology's Wetland Rating System for Western Washington;
12. A description of the proposed use or activity's potential direct or indirect impacts to the wetland(s), associated buffer(s) and related functions, including stormwater-related impacts to wetland hydrology; and the size of the impacted area;

13. Demonstration of compliance with applicable provisions of this chapter.

24.35.380 Wetlands – Special reports – Wetland mitigation plan.

Wetland impacts shall be mitigated consistent with an approved mitigation plan. The applicant shall submit a conceptual wetland mitigation plan generally containing the information listed below, as applicable. The county may require use of a standardized wetland mitigation report format.

If the approval authority approves the conceptual mitigation plan, the applicant shall submit a detailed mitigation plan to the approval authority for review and approval, consistent with the provisions of this section. Prior to submitting detailed wetland mitigation plan, the applicant shall meet with the approval authority to discuss the submittal requirements.

- A. Demonstrate qualifications. A professional wetland scientist shall prepare the mitigation plan. This scientist shall be knowledgeable of wetland conditions within Thurston County and have experience designing wetland mitigation projects, at least some of which have been installed and monitored for a minimum of two years. The design team may include other participants as needed.

Applicants proposing a wetland mitigation project shall demonstrate that the individuals designing, constructing, and monitoring the project have sufficient expertise, supervisory capability, and financial resources to carry out the proposed project. A project manager shall be named, and the qualifications of each team member involved in preparing the mitigation plan and implementing and supervising the project shall be provided, including educational background, areas of expertise, training, and experience with comparable projects. The approval authority, in consultation with Ecology, shall verify the success of the mitigation

- B. Report. Wetland mitigation plans shall include a written report and a site plan, commensurate with the scope of the development proposal, including the relevant components listed below: (Also see the Draft Guidance on Wetlands Mitigation in Washington State, Washington State Department of Ecology publication number 04-06-013B Part 2, 2004).
 1. The applicant's name and contact information;
 2. The name, qualifications, and contact information for the primary report author(s);
 3. The location and parcel number of proposed mitigation area;
 4. Identification of all the local, state, and federal wetland related permits required for the project;
 5. A description of the impacted wetland including, at a minimum:
 - a. The wetland's landscape position and the geomorphology of the impacted site;
 - b. The wetland's category, consistent with TCC 24.30.030;

- c. The wetland's hydrogeomorphic class;
 - d. A characterization of existing wetland and buffer functions;
 - e. Existing wetland acreage;
 - f. Vegetative communities, affected Cowardin classes;
 - g. Hydrologic characteristics;
 - h. Soil and substrate conditions; and
 - i. Topography.
6. A description of the compensation site, if different from the impacted wetland site, including at a minimum:
- a. Site size;
 - b. Plant communities/Cowardin classes present on site, including any invasive plants or noxious weeds;
 - c. Existing wetland and buffer functions;
 - d. Soil and substrate conditions; and soils (e.g., soil pit data – hand dug or mechanically trenched, soil boring data; not soil survey data);
 - e. Topography;
 - f. General hydrologic patterns on the site including identification of groundwater availability; frequency, depth, duration, and timing of flooding; the field data collected to document existing conditions on which future condition assumptions will be based for the hydroperiod; the site's relationship to the watershed/water bodies and demonstration that the site will have an hydrogeomorphic class appropriate for its position in the landscape. Hydrologic monitoring and analysis may be required to document that the proposed source of water and predicted hydroperiod are attainable and suitable for the site and will not adversely impact an existing wetland. If the proposed project could affect Category I wetlands, the approval authority may require computer modeling in determining the hydroperiod;
 - g. For those sites that have been recently altered or degraded, a description of historic conditions;
 - h. The adjacent site conditions and any known proposed use;

7. An estimate of future conditions at the proposed compensation site if the compensation actions are not undertaken (i.e., how would this site progress through natural succession);
8. A summary of the proposed wetland and buffer impacts and the proposed compensation concept, including:
 - a. Site selection criteria;
 - b. Demonstration that the proposed mitigation replaces all lost and diminished wetland and buffer functions;
 - c. A complete description of the structure and functional relationships sought in the new wetland and buffer;
 - d. For years 1, 3, 5, 10 and 25, and post-installation, conditions expected from the proposed actions on the compensation site including future hydrogeomorphic types, vegetation community types by dominant species (wetland and upland), and including the succession of vegetation community types and dominants expected;
 - e. An assessment of the potential changes in wetland hydroperiod due to the proposed project and how the design has been modified to avoid, minimize or reduce adverse impacts to the wetland hydroperiod;
 - f. The successional sequence of expected changes in hydroperiod for the compensation site(s) for years 1,3,5,10,25 and post installation;
 - g. The change in habitat characteristics expected over the same 25-year time period;
 - h. An analysis of the likelihood of persistence of the created or restored wetland based on such factors as surface and groundwater supply and flow patterns, dynamics of the wetland ecosystem, sediment or pollutant influx and/or erosion, periodic flooding and drought, presence of invasive flora or fauna, and potential human or animal disturbance.
9. Identification of the mitigation goals, objectives, and the performance standards that will be used to evaluate whether the mitigation is achieving the project goals and objectives.

Identification of the reference wetland used to develop the project goals, objectives and performance standards.

The performance standards shall provide a measurable benchmark for determining whether the project is meeting the mitigation goals and objectives at various stages in the project and establish thresholds for triggering remedial action or contingency measures. At a minimum, performance standards shall address the following:

- a. Wetland size;
 - b. The water regime, (e.g., establishment of wetland hydrology, permanently ponded, seasonally inundated); designed hydroperiods; and water quality. Including identification of the proposed method by which the hydroperiod will be evaluated;
 - c. Vegetative structure and establishment of viable plant communities (e.g., percent cover with wetland species, area of various Cowardin classes, multi-species, mixed canopy community comprised of emergent, scrub-shrub, and tree species); and survival rates of planted vegetation and coverage for each vegetative stratum;
 - d. Hydric soil formation;
 - e. If relevant, wildlife habitat (species abundance and diversity targets, habitat diversity indices), or other ecological, geological or hydrological factors;
10. The dates for beginning and completing the project;
 11. For wetland restoration and creation projects, a review of the available literature and/or experience to date in restoring or creating the type of wetland proposed;
 12. Maintenance plan. A maintenance plan shall be submitted that describes proposed management practices that will protect the wetland and buffer after the project site has been developed. Maintenance includes, but is not limited to, the removal and control of invasive vegetation and noxious weeds, replacement of dead or dying planted vegetation and trash and debris removal;
 13. Monitoring and contingency plans. Monitoring and contingency plans shall be submitted consistent with TCC 24.35.017.
- C. Construction plans. If the detailed mitigation plan is approved, the applicant shall submit construction plans consistent with the approved mitigation plan, and a sequence of construction activities. Wetland mitigation shall occur consistent with a schedule approved by the approval authority.

Written specifications and descriptions of compensation techniques shall be provided including, but not limited to, the proposed construction sequence, grading and excavation details, erosion and sediment control features needed for wetland construction and long-term survival, a planting plan specifying plant species, quantities, locations, size, spacing, and density; source of plant materials, propagules, or seeds; water and nutrient requirements for planting; where appropriate, measures to protect plants from predation; irrigation requirements; specification of substrate stockpiling techniques and planting instructions; descriptions of water control structures and water-level maintenance practices needed to achieve the necessary hydrocycle/hydroperiod characteristics;

These written specifications shall be accompanied by detailed site diagrams, scaled cross-sectional drawings, and topographic maps showing slope percentage and final grade elevations, and any other drawings appropriate to show construction techniques or the

anticipated final outcome. The plan shall provide for elevations which are appropriate for the desired habitat type(s) and which provide sufficient tidal prism and circulation data. The scaled plan sheets for the compensatory mitigation must contain, at a minimum:

1. Existing wetland and buffer boundaries, proposed areas of wetland and/or buffer impacts, location of proposed wetland and/or buffer compensation actions;
 2. Approximated site topography before and after alteration at one-foot contour intervals in the zone of the proposed compensation actions if any grading activity is proposed to create the compensation area(s).
 3. A planting plan prepared by a wetland specialist including plant selection, planting densities, placement, planting instructions, water and nutrient requirements, and provision for an irrigation system, if necessary, until plants are established.
- D. Construction monitoring. The wetland scientist who designed the mitigation project shall be onsite to provide construction oversight as warranted to ensure that the project is constructed as designed.
- E. As-built. Upon completion of construction for the wetland mitigation project, the applicant shall submit an as-built report to the county for review and approval.
- F. Budget. A detailed budget for implementing the mitigation plans, including construction, monitoring, maintenance, and contingency phases shall be submitted.
- G. Surety. A surety estimate for the entire compensatory mitigation including the following elements: site preparation, plant materials, construction materials, installation oversight, maintenance twice/year for up to five years, annual monitoring field work and reporting, and contingency actions for a maximum of the total required number of years for monitoring. Separate estimates shall be prepared for the installation phase and monitoring and maintenance phase of the project; a surety consistent with chapter 24.70 TCC is required for the duration of the monitoring period.