



San Juan County Community Development & Planning

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To: San Juan County Planning Commission
**From: Janice Biletznikoff, AICP
Planner III**
**Re: July 15, 2011 Public Hearing on Geologically Hazardous and Frequently
Flooded Critical Area Regulations**
Date: June 30, 2011

Issue

Update the existing SJCC Critical Areas Ordinance for Geologically Hazardous and Frequently Flooded Areas by amending sections 18.30.120 and 18.30.130, as required by RCW 36.70A.130.

Background and General Discussion

The Washington Growth Management Act (GMA) requires the periodic review and update of critical areas regulations. As part of that review, the County has considered and included the Best Available Science (BAS) regarding Geologically Hazardous and Frequently Flooded Areas and identified some portions of the existing regulations for these critical areas that are in need of updating. These include areas where the current regulations do not meet the minimum levels of protection found in the BAS (where applicable) as necessary to preserve the functions and values of critical areas. The proposal includes recommendations to address these deficiencies, as well as correcting some existing inaccuracies or errors in the text, and clarify existing terms and procedures. The proposal also includes language that will improve consistency and predictability for both the County and property owners.

For Geologically Hazardous Areas, the proposed ordinance:

1. clarifies the purpose;
2. refines the methods for measuring slope;
3. adds landform types for greater consistency with the WAC;
4. includes options for the characterization of hazard soil types;
5. classifies moderate to high liquefaction susceptibility areas as Category II;
6. prohibits new essential public facilities from Category I and II areas (with exceptions, including those provided in the existing code language regarding essential public facilities unable to meet some standards; see SJCC 18.80.190);
7. requires geotechnical reports for development applications in Category II areas;
8. includes options for addressing the discharge of water near high hazard areas;
9. includes options for addressing the threat of tsunami waves;
10. includes options for addressing the construction of bulkheads;
11. clarifies the project area and content for geotechnical reports;
12. defines the term qualified professional (in reference to geotechnical reports); and
13. clarifies when geotechnical reports are required and what considerations they must contain.

For Frequently Flooded Areas, the proposed ordinance:

1. prohibits new essential public facilities within flood hazard areas (with exceptions, including those provided in the existing code language regarding essential public facilities unable to meet some standards; see SJCC 18.80.190).

At the County Council workshop that was held June 13-14, 2011, Council members requested additional information about the context of those recommendations that include specific numbers as thresholds or distances. The following attempts to satisfy the inquiries regarding those items:

- **Measuring slope** - In section 18.30.120(A), the current regulations require that slope be measured over a minimum of 20 vertical feet of relief. Unfortunately, not all properties have 20 vertical feet of rise, especially those that are relatively flat and smaller in size. Even a larger parcel may not have a total rise of 20 vertical feet, but the development area could include some varied topography that should be addressed during the building process. Since the current code is silent on the method to be employed for properties that cannot meet this minimum requirement, the shorter rise will allow more properties to comply with the code requirement and for a more accurate determination of slope to be made. The recommendations also add explicit direction on how to measure slope when a property cannot meet the new minimum vertical rise requirement. The recommendation to reduce the minimum vertical distance originated from the Department of Commerce Example Code Provisions from the 2003 *Critical Areas Assistance Handbook* (and its Best Available Science) and from the expert opinion of Brendan Cowan, Director of the San Juan County-Friday Harbor Department of Emergency Management.

The current code also fails to explain where the slope is to be measured on the subject property. On a large property, the owner could choose any area with a 20-foot vertical rise to measure the slope. Considering the dramatic variations in topography that can occur across a given parcel, this approach would not give the information that is needed: the average slope across the area where development is to take place. The recommendations attempt to remedy this by stating that the slope is to be measured perpendicular to the contour of the land, which should give a more accurate profile. Also, the (later) recommendation that the geotechnical report define the project area as including all geologically hazardous areas [on the subject property] and all potentially affected areas within 200 feet of the proposed development ensures that the slope which is characteristic of the area to be developed will be included in the area being analyzed.

- **Discharge of surface water** – Sections 18.30.120(B)(1)(c) and 18.30.120(B)(2)(c) include an option that would add new text regarding the discharge of concentrated runoff within 50 feet of a landslide or erosion hazard area in Category I and II hazard areas. Sources of added water, such as the concentrated discharge of runoff, can alter the site hydrology and greatly exacerbate these types of hazards. When runoff is discharged in close proximity to sensitive landforms, small changes can have large impacts and therefore the potential impacts must be more carefully analyzed. This recommendation originated from the best management practices found in the *Stormwater Management Manual for Western Washington* (Ecology, 2005).
- **Tsunami waves** - Section 18.30.120(B)(2)(h) includes an option that would add new text to address the risk of tsunami waves. This option is to elevate the habitable portion of structures along marine shorelines 10 feet above the ordinary high water mark. This figure originated from the tsunami modeling done for Port Townsend, which is the most similar comparison to San Juan County. (San Juan County does not currently have a tsunami hazard map). The model estimates that a large Cascadia subduction earthquake would result in a wave of approximately ten feet, reaching up to 20 feet at the head of long, narrow inlets. Recent tsunami modeling for this area from Fisheries and Oceans Canada concurs with this projected wave height. Such a tsunami would likely manifest as the rising and falling of tidal waters, as opposed to a large cresting wave. A wave or tidal surge of this height would be accommodated by the recommendation to elevate habitable areas 10 feet above the ordinary high water mark, with

anchoring to prevent flotation, collapse, or lateral movement. Planning for a tsunami event considers inundation factors as well as reinforcement against lateral forces in order to allow for the safe passage of water into and out of the structure without collapse or other structural damage.

- **Project area for geotechnical reports** - Section 18.30.120(C) includes suggested text that defines the project area for the geotechnical report as including all geologically hazardous areas [on the subject property] and all potentially affected areas within 200 feet of the proposed development. The current code does not specify the project area for geotechnical reports. The suggested distance of 200 feet is to ensure that geological features that might affect the proposal (or might be affected by the proposal) are considered in the analysis of the geotechnical report. Geologic hazards need not be immediately beneath a structure to threaten it, and increasing distance increases the degree of safety. The necessary distance between a Geologically Hazardous Area and a proposed development is best determined on a site-specific basis in the geotechnical report, and 200 feet out is the minimum area that should be assessed for any potential threats to be avoided (or any impacts that may be caused by the subject development). In some cases, a distance of 200 feet from the proposed development may extend beyond the subject property's boundaries. In such a situation, the use of various maps, soils surveys, aerial imagery, and other existing resources should provide adequate information, when used in concert with more detailed investigation on the subject property. This recommendation originated from the State Example Code (and its Best Available Science). The concept of looking well beyond the proposed development to assess any threats or areas that could be impacted, however, is found throughout much of the BAS.

Risk Analysis

WAC 365-195-915(1)(c)(i-iii) requires that the review and update of critical areas regulations include consideration of the Best Available Science (BAS), and a risk analysis of any departure of the recommended regulations from the minimum thresholds identified in the science for the protection of functions and values of critical areas. The following is a description of some areas of potential departure in the proposed ordinance.

Geologically Hazardous Areas

- **LiDAR** - The Best Available Science (BAS) recommends the use of LiDAR technology to better identify hazard areas such as landslides. Mapping technologies have improved to the point where it can, for example, reveal the full extent of historic landslides that were previously not detectable. The use of LiDAR technology would be helpful in interpreting Geologically Hazard Areas for future development assessment in San Juan County. However, the data set is incomplete, as the imagery has not yet been obtained for the County's outer islands. It is staff's understanding that the use of LiDAR technology for all individual applications is not feasible in the near future.

Using LiDAR to augment staff analysis of all applications with Geologically Hazardous Areas is a policy, not regulatory, decision. While this technology can enhance the understanding of conditions on a property, much of the information it would yield will likely already be included in the content of geotechnical reports (when they are required). Between constraints on staff time for interpreting LiDAR information and the incomplete data set, the current recommendation is to use LiDAR to assist in analysis on an as-needed basis for the time being, for more complex cases. Considering that the most needed information will already be provided in the geotechnical report, this slight departure from BAS results, then, in an overall negligible level of risk to the functions and values of the critical area and to safety. Staff continues to recommend its regular use on an as-needed basis as often as is practicable.

- **Tsunami waves** – The BAS includes projections that were taken from tsunami wave modeling done for Port Townsend; specifically, for a tsunami resulting from a large Cascadia subduction earthquake. Unfortunately, San Juan County does not yet have an official tsunami hazard map or modeling of wave height and run-up zones. While awaiting the creation of detailed local modeling for San Juan County, our Department of Emergency Management is using the Port Townsend model in the interim. The scientific data shows the likely inundation height to be approximately 10 feet above mean high water.

The current code does not include any language regarding tsunami waves but the GMA requires it be considered for Geologically Hazardous Areas. The recommended option is to elevate the habitable portion of structures 10 feet above the ordinary high water mark, with anchoring to prevent flotation, collapse, or lateral movement. This will allow a small additional measure of safety in the absence of a more detailed local model. It is anticipated that the mapping could be completed within the next several years and that the projected wave height would likely not change very much. Therefore, the recommended option is supported by the existing BAS, in regard to safety and the functions and values of Geologically Hazardous Areas. The other option, providing only educational and informational materials about tsunami waves, is also supported by the BAS, but may be less effective in increasing the safety of structures. Even with this slight difference, the increased risk to the functions and values of Geologically Hazardous Areas would be negligible.

Frequently Flooded Areas

- **Sea Level Rise** – The BAS provides a great deal of information about predicted sea level rise. Models vary for San Juan County coastlines, but the general consensus is that the historically rising levels will continue to increase in the future. Because inundation areas and run-up zones that extend beyond the existing coastline will vary based on site-specific topography, it is staff's belief that the existing requirement for site-specific flood elevations determined by the U.S. Army Corps of Engineers (which includes an additional recommended elevation to expressly accommodate sea level rise- two vertical feet above base flood elevation) adequately address safety concerns regarding inundation under rising waters. To augment this, County staff will be providing educational and informational materials on anticipated sea level rise to land owners developing coastal properties, so that they can determine if additional vertical rise is warranted. The recommended policy will not adversely impact the functions and values of Frequently Flooded Areas.

Findings

- The proposed recommended amendments will satisfy the requirements of the Growth Management Act.
- Clarifying the purpose of the regulations will enhance consistency with the WAC.
- Reducing the minimum required vertical rise and clarifying the method for measuring slope will allow for broader compliance and improve the accuracy of the slope characterization, reducing confusion for both staff and property owners (and their agents).
- Adding previously omitted landforms listed in the WAC will enhance consistency with state regulations.
- Due to the conflict between the new and old soil naming conventions, explicitly listing soils with a subclass suffix of "e" (those with a high risk of erosion) will replace the existing incorrect reference to individual soil types and include the hazardous soils as Category II hazard areas. Their inclusion as Category II will ensure that the necessary geotechnical information will be provided to the County with development applications.
- Including all areas that are mapped as having a moderate to high susceptibility to liquefaction as Category II will ensure that the necessary geotechnical information will be provided to the County with development applications.

- Updating the name of the seismic rating class will enhance consistency with the International Building Code and the International Residential Code.
- Prohibiting essential public facilities from hazard areas and flood zones (with exceptions) will enhance consistency with the adopted policies of the San Juan County Comprehensive Plan.
- Requiring geotechnical reports for the discharge of concentrated runoff within 50 feet of hazard areas in Category I and II areas will ensure that the necessary geotechnical information will be provided to the County with development applications.
- Requiring geotechnical reports for development applications within Category I and II areas will ensure that the County will receive the site-specific, detailed geotechnical information necessary in order to determine if a project meets the required criteria- or qualifies for a waiver or modified requirements (as provided in the code).
- Elevating the habitable portions of coastal structures above the anticipated inundation zone for tsunami waves will enhance safety.
- Correcting the building code title will enhance consistency with the current International Building Code.
- Requiring geotechnical reports for the construction of new bulkheads will provide the County with the necessary information to determine if a project will have potential adverse impacts to nearby properties, and if less engineered options exist to address erosion problems on the site.
- Clarifying the project area, content, and author of geotechnical reports will allow for a more comprehensive view of potential geological threats and allow for the site-specific determination of any necessary buffers or setbacks. This will also ensure that an experienced and licensed individual is authoring the report (i.e., that the information contained therein can be relied upon).

Documents provided to County Council for the workshops held June 13-14, 2011:

- State laws and regulations associated with the protection of critical areas
- San Juan County Comprehensive Plan Goals and Policies associated with critical areas
- Review and recommendations on General CAO regulations (SJCC 18.30.110)
- Review and recommendations on Frequently Flooded Areas
- Review and recommendations on Geologically Hazardous Areas
- Review and recommendations on Wetlands
- Review and recommendations on Upland Fish and Wildlife Habitat Conservation Areas
- Review and recommendations on Marine Fish and Wildlife Habitat Conservation Areas
- Three documents on Reasonable Use Exceptions from the Prosecuting Attorney's office
- June 3, 2009 draft Upland Fish and Wildlife Habitat Conservation Areas critical area regulations prepared by former CAO Citizen Review Committee (Note: this previous draft will be considered along with all other input on the regulations and it is not the current proposal.)
- Minority reports from former CAO Citizen Review Committee on June 3, 2009 draft

New enclosures:

- Draft ordinance for hearing of July 15, 2011 – In this draft, the existing code is shown with strikethroughs to indicate text that is to be removed and underlines to indicate amendatory text that is to be added. Where multiple options are presented, the option recommended by staff is shown in bold.
- CAO Policy Direction (notes/decision summary) from County Council
- SEPA checklist
- Planning Goals of the Growth Management Act