

City of Longview



Critical Areas Ordinance Update Task 2: CAO Analysis & Best Available Science Review

June 2016

Prepared for:



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Introduction

Local jurisdictions in Washington are required to develop policies and regulations to designate and protect critical areas under the Growth Management Act Chapter 36.70A Revised Code of Washington (RCW). As defined by RCW 36.70A.030(5), critical areas include wetlands, areas with a critical recharging effect on aquifers used for potable water, fish and wildlife habitat conservation areas, frequently flooded areas, and geologically hazardous areas.

In designating and protecting critical areas under this chapter, jurisdictions include the best available science (BAS) in developing policies and development regulations to protect the functions and values of critical areas (RCW 36.79A.172(1)). In addition, jurisdictions shall give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries.

RCW 36.70A.130 requires local jurisdictions to review and evaluate their adopted critical area and natural land policies and development regulations. The City of Longview last updated its critical areas ordinance in 2009. In the current update cycle, the City is required to update its critical areas policies and regulations by June 30, 2017 (RCW 36.70A.130(5)(c)).

This summary report's purpose is two-fold:

1. To determine if best available science is being applied. BAS references, as appropriate, are identified in each section's analysis. Because no clearinghouse of technical references exists, this is not an exhaustive list of BAS references but identifies important key references by section or subsection. A more comprehensive bibliography, but again, not exhaustive list, is contained in the accompanying *References for Best Available Science* report prepared by Ecological Land Services, Inc. and Earth Engineers, Inc.
2. To review the City's existing critical areas ordinance (CAO) No. 3082 and analyze where existing regulations may not be consistent with BAS or the Growth Management Act for the following critical areas:
 - Wetlands;
 - Fish and Wildlife Habitat Conservation Areas;
 - Frequently Flooded Areas; and
 - Critical Aquifer Recharge Areas.
 - Geologically Hazardous Areas are addressed in an accompanying report prepared by Earth Engineers, Inc.

The following critical area ordinances were reviewed in preparing this CAO analysis:

TABLE 1. CRITICAL AREA ORDINANCES REVIEWED IN CAO ANALYSIS

Jurisdiction	Effective Date
City of Camas	2008
City of Ilwaco	2015
City of Vancouver	2007
Clark County	2006
Cowlitz County	2009
Lewis County	2008

In addition, the City's existing Shoreline Master Program (SMP), adopted in 2015, was reviewed to verify the suggested CAO changes are consistent with the SMP.

The main changes recommended to the City's existing CAO (Ordinance No. 3082) are as follows, with more detail provided by section or subsection in the critical areas analysis that proceeds this introduction.

- Update many of the definitions in 17.10.050 with new regulatory definitions and add new definitions, particularly related to wetland mitigation.
- Clarify what the term *technical assessments* means because it is not clear and varies throughout Chapters 17.10 and 17.12. We recommend defining what is meant by a technical assessment or eliminating the term in favor of calling out the specific reports, e.g. *critical areas report* and *wetland mitigation plan*.
- Combine 17.10.040, .090, and .240 into a single section to address relationship to regulatory agencies and regulations more concisely in one place.
- Group the exempted wetlands in 17.10.110.2 with the exempted activities in 17.10.070 to address all the exempted activities in a single section.
- Revise the exempted wetland language in 17.10.110.2 as it needs to be better defined by wetland category. See Ecology's *Wetland Guidance for CAO Updates* (Publication No. 16-06-001) for the latest guidance.
- Determine if it would be useful to provide partial exemptions for some activities in wetlands and buffers in 17.10.110.3 to allow more flexibility for activities that do not impact functions and values.
- Revise the wetland buffer averaging and wetland buffer width reduction subsections, 17.10.110.5 and 17.10.110.6, respectively, to more closely align with Ecology's *Wetland Guidance for CAO Updates* (Publication No. 16-06-011) or another CAO, such as Clark County, if it is determined that these two subsections can differ from the SMP.
- Add a mitigation sequencing section to Chapter 17.10 as it is missing.
- Update the wetland categories and habitat scores according to Ecology's latest wetland rating system (2014 update) and revise the wetland buffer tables.
- Add a section for functionally isolated buffers in 17.10.120 Fish and Wildlife Habitat Conservation Areas as it is missing.
- Move 17.10.160 Mitigation Plan Performance Standards to Chapter 17.12, to group all the report and plan requirements together.
- Add more details to wetland mitigation plan requirements, following Ecology's *Mitigation in Washington State* (Publication No. 06-06-011), to give the preparer more clarity on the mitigation plan requirements.
- Update the mitigation language in 17.10.110.9 to be consistent with 33CRF 332.
- Add a section for fish and wildlife habitat conservation plan assessments as it is missing.

The critical areas analysis that follows is organized by section of the City's published CAO, Chapter 17.10 *Critical Area Ordinance* and Chapter 17.12 *Standards for Preparing Plans and Assessments for Critical Areas*. Any new sections are identified in the section or subsection heading name.

Editorial Note: The numbering in this summary report follows the sequence in the published code. When content changes are completed, the entire numbering/lettering formatting of Chapters 17.10 and 17.12 will need to be edited.

Limitations

The services described in this report were performed consistent with generally accepted professional consulting principles and practices. There are no other warranties, express or implied. The services performed were consistent with our agreement with the City of Longview. This report is prepared solely for the use of the City of Longview and may not be used or relied upon by a third party for any purpose. Any such use or reliance will be at such party's risk.

Chapter 17.10 Critical Area Ordinance

SUBSECTION	REVIEW COMMENT / RECOMMENDATION	BAS REFERENCES
17.10.010 Introduction and Background		
.010	<ul style="list-style-type: none"> ▪ Determine if this chapter should be called "Critical Areas" or "Critical Area Ordinance." Some jurisdictions omit "ordinance" from the title. Additionally, critical "area" is singular and other times it is "plural" in other codes. Determine the correct language. ▪ Re-order critical areas to match order followed in the chapter. ▪ Consider adding the following to the introduction and re-ordering/omitting some of the content to make it more concise: <ol style="list-style-type: none"> 1. This chapter implements the goals, policies, guidelines, and requirements of the Growth Management Act, as amended, and the city's comprehensive plan. 2. The purpose of this chapter is to identify and classify ecologically sensitive and hazardous areas and to protect these areas and their functions and values, while also allowing for reasonable use of private property. 3. The city finds that the beneficial functions, structure, and values of critical areas should be protected as identified in this chapter, and further that potential dangers or public costs associated with inappropriate use of such areas should be minimized by reasonable regulation of uses within, adjacent to, or directly affecting such areas. 4. This chapter establishes review procedures for development proposals in and adjacent to critical areas. <p>Best available science shall be used in the administration of this chapter.</p>	None
17.10.020 Title and Purpose		
.020	<ul style="list-style-type: none"> ▪ Re-order critical areas to match order followed in chapter. 	Critical Areas Assistance Handbook: Protecting Critical Areas, CTED 2007
17.10.030 Statutory Authorization		
.030	<ul style="list-style-type: none"> ▪ Add language from RCW 36.70A.172(1) and WAC 365-195-900 which states that Counties and cities must give "special consideration" to conservation or protection measures necessary to preserve or enhance anadromous fisheries. 	Wetland Guidance for CAO Updates, Ecology No.16-06-001
17.10.040 Applicability and Relationship to Other Regulatory Agencies		
.040	<ul style="list-style-type: none"> ▪ Consider adding the following so that can combine content in 17.10.040, .090, and .240: <ol style="list-style-type: none"> 1. These critical areas regulations shall apply as an overlay and in addition to zoning and other regulations adopted by the city. 	Critical Areas Assistance Handbook: Protecting Critical Areas, CTED 2007

SUBSECTION	REVIEW COMMENT / RECOMMENDATION	BAS REFERENCES
	<p>2. In the event of any conflict between this chapter and any other city regulations, the regulation that provides more protection for the critical area shall apply.</p> <p>3. Compliance with the provisions of this chapter does not constitute compliance with other federal, state, and local regulations and permit requirements that may be required. The applicant is responsible for complying with other requirements apart from the requirements of this chapter.</p> <ul style="list-style-type: none"> Confirm that the final sentence of this section is necessary "In addition to the provisions established in this chapter..." 	
17.10.XXX New Section(s): Interpretation, Authority, and/or Fees		
	<ul style="list-style-type: none"> Determine if need to add section(s) for Interpretation, Authority, or Fees. Sample text is below from the City of Ilwaco CAO. <p>Interpretation. In the interpretation and application of this chapter, its provisions shall be considered to be the minimum requirements necessary, shall be liberally construed to serve the purposes of this chapter, and shall be deemed to neither limit nor repeal any other provisions under state statute.</p> <p>Authority.</p> <ol style="list-style-type: none"> The director or his or her designee(s) shall be the administrator of this chapter and is given the authority to interpret and apply, and the responsibility to enforce, this chapter to accomplish the stated purposes. The city may withhold, condition, or deny development permits or approvals to ensure that the proposed action is consistent with this chapter. 	None
	<ol style="list-style-type: none"> The director and other applicable city officials may develop and implement administrative rules and regulations that are consistent with and effectuate the purposes of this chapter, and prepare and require the use of such forms as necessary for its administration. <p>Fees.</p> <ol style="list-style-type: none"> The applicant shall be responsible for the initiation, preparation, submission, and expense of any required reports, assessments, studies, plans, and other work prepared in support of or necessary to review the application. 	
17.10.040 Definitions		
.050	<ul style="list-style-type: none"> Eliminate one of the "unless the context clearly appears otherwise" from the opening paragraph of this section. Determine if need to revise some of the definitions to match those in Ecology's CAO Update guidance, WAC 365-190-030, and RCW 36.70A.030; see edits on definition section of CAO. In particular, need to confirm BAS definition is accurate as the language isn't consistent with WAC 365-195-900 through -925. 	Wetland Guidance for CAO Updates, Ecology No. 16-06-001 and WDFW Management Recommendations

SUBSECTION	REVIEW COMMENT / RECOMMENDATION	BAS REFERENCES
	<ul style="list-style-type: none"> ▪ Revise and add <i>Preservation, Enhancement, Re-establishment, Rehabilitation, and Restoration</i> to match 33 C.F.R. § 332 definition. ▪ Add <i>Volcanic Hazard Area</i>. ▪ Considering adding <i>Biodiversity Areas and Corridors, Isolated Wetland, Out-of-Kind Mitigation, Project area, Threatened Species, Sensitive Species, Endangered Species, Stream, Soil Survey, and Wetland Mitigation Bank</i> to definitions. ▪ Possibly combine definitions for <i>Wetland Functions</i> and <i>Wetland Values</i> and update definition. ▪ Determine if need to update <i>Oak Woodlands</i> definition as doesn't match WDFW PHS exactly. The definition by WDFW is: "Priority Oregon white oak woodlands are stands of pure oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%; or where total canopy coverage of the stand is <25%, but oak accounts for at least 50% of the canopy coverage present. In non-urbanized areas west of the Cascades, priority oak habitat is stands 0.4 ha (1 ac) in size. In urban or urbanizing areas, single oaks, or stands of oaks <0.4 ha (1 ac), may also be considered priority habitat when found to be particularly valuable to fish and wildlife (i.e., they contain many cavities, have a large diameter at breast height [dbh], are used by priority species, or have a large canopy)." ▪ Determine if should add specific requirements under <i>Qualified Expert</i> for habitat or geologic expert. 	
17.10.060 Applicability/Regulated Activities		
.060	<ul style="list-style-type: none"> ▪ Re-order critical areas to match order in chapter. ▪ Omit sentence about the more restrictive requirements being applied because it is already stated in 17.10.040. ▪ Confirm that this sentence's language is correct: "Any development or use that requires approvals under existing or subsequently adopted development codes of the City of Longview." 	None
17.10.070 Exemptions		
.070	<ul style="list-style-type: none"> ▪ Edit and update some of the definitions per the Ecology CAO Update guidance. See specific edits on code. ▪ Add the following exemptions: <ul style="list-style-type: none"> ▪ Trails ▪ Enhancement of wetland vegetation ▪ Stormwater management facilities ▪ Determine if can group the "ongoing maintenance" and/or "clearing" exemptions together to be more concise. 	Wetland Guidance for CAO Updates, Ecology No. 16-06-001

SUBSECTION	REVIEW COMMENT / RECOMMENDATION	BAS REFERENCES
17.10.071 Exception – Reasonable Use		
.071	<ul style="list-style-type: none"> ▪ Determine if need to define <i>accessory structure</i> and the type of home, e.g. single-family, manufactured home? 	None
17.10.072 Critical Area Permits – Applications and Approvals		
.072	<ul style="list-style-type: none"> ▪ Confirm that City wants to call the reports “technical assessments.” The paragraph reads as if talking about critical area reports and mitigation plans. The language for the technical assessments, reports, summaries, mitigation plans needs to be better defined and made consistent in this section, other parts of this chapter, and Chapter 17.12/ 	None
17.10.080 Pre-Application Conference		
.080	<ul style="list-style-type: none"> ▪ No changes suggested. 	Critical Areas Assistance Handbook: Protecting Critical Areas, CTED 2007
17.10.090 Relationship to Other Regulations		
.090	<ul style="list-style-type: none"> ▪ Omit. This section can be incorporated into 17.10.040 with minor edits. 	None
17.10.100 Critical Area Inventory Maps		
.100	<ul style="list-style-type: none"> ▪ Re-order critical areas to follow order addressed in chapter. ▪ Add map data sources for Geologically Hazardous Areas suggested by geological consultant. ▪ Add Web Soil Survey in lieu of hydric soils, as that is the name of the database. ▪ Edits to map names for accuracy and agency citations for consistency. See edits to code. 	None

17.10.110 Critical Area Wetlands

SUBSECTION	REVIEW COMMENT / RECOMMENDATION	BAS REFERENCES
– Wetland Classification		
.110.1	<ul style="list-style-type: none"> ▪ Note that the RCW only refers to “wetlands” not “critical area wetlands.” Considering changing the title of this section. ▪ Update to 2014 wetland rating system. ▪ Change classifications to be based on Ecology’s 2014 wetland rating system manual and as appropriate for the City. ▪ Determine if should move exempted wetland language to section 17.10.070, which describes exempt activities. 	Wetland Rating System for Western Washington: 2014 update, Ecology No.14-06-029 and Wetland Guidance for CAO Updates, Ecology No. 16-06-001

SUBSECTION	REVIEW COMMENT / RECOMMENDATION	BAS REFERENCES
– Exempted Wetlands		
.110.2	<ul style="list-style-type: none"> Need to review this section and determine wetland size and categories for exemptions and then edit the language. Possibly use Clark County Code as an example. Note: Ecology's guidance only recommends exemption for <u>isolated</u> Category IV wetland less than 4,000 sf. 	Wetland Rating System for Western Washington: 2014 update, Ecology No.14-06-029 and Wetland Guidance for CAO Updates, Ecology No. 16-06-001
– Development Limitations		
.110.3	<ul style="list-style-type: none"> Consider adding partial exemptions for wetland and buffers, see City of Ilwaco's CAO and moving this section to end of section 17.10.070 so that it is grouped with the other exemptions. Determine where to place a section for mitigation sequencing; it appears to be missing. 	Critical Areas Assistance Handbook: Protecting Critical Areas, CTED 2007 and Mitigation in Washington State, Parts 1 & 2 Ecology No. 06-06-011a&b
– Wetland Buffers		
.110.4	<ul style="list-style-type: none"> Updated habitat scores to match 2014 wetland rating system. Updated buffer widths to be consistent with SMP and Ecology guidance (note that there is some discrepancy for Category III wetland buffers). Will need to review the buffer widths closely and in conjunction with the SMP. Determine if want to add "structures" and "vertical separation" to the list of items that functionally isolate buffers Consider moving the signs/fencing requirement for buffers to another section as the content seems out of place in this subsection. 	Update on Wetlands Buffers, Ecology No. 13-06-11; Wetlands in Washington State, Ecology No. 05-06-008; Critical Areas Assistance Handbook: Protecting Critical Areas, CTED 2007; Wetland Rating System for Western Washington: 2014 update, Ecology No.14-06-029; and Wetland Guidance for CAO Updates, Ecology No.16-06-001
– Wetland Buffer Width Averaging		
.110.5	<ul style="list-style-type: none"> This section currently is identical to the SMP. Determine if can make any edits. Consider deleting first paragraph (5a) about variations in intensity and not impacting wetland functional values because these are subject to interpretation. Before deleting, note that this paragraph is the SMP. Determine if want to set cap on the total area that can be averaged over the entire site, e.g. 25 percent. Determine if should include minimum buffer language in this section, to be consistent with Ecology CAO Update guidance. 	Wetlands in Washington State, Ecology No. 05-06-008; Mitigation in Washington State, Parts 1 & 2 Ecology No. 06-06-011a&b; and Wetland Guidance for CAO Updates, Ecology No.16-06-001

SUBSECTION	REVIEW COMMENT / RECOMMENDATION	BAS REFERENCES
– Wetland Buffer Width Reduction		
.110.6	<ul style="list-style-type: none"> ▪ This section currently is identical to the SMP. Determine if can make any edits because other codes allow greater flexibility if certain design elements, such as buffer enhancement, shielding of high intensity uses, surface water management, are implemented. ▪ Not sure if this major of a change is acceptable given the language that is already spelled out in the SMP. 	Wetlands in Washington State, Ecology No. 05-06-008; Mitigation in Washington State, Parts 1 & 2 Ecology No. 06-06-011a&b; and Wetland Guidance for CAO Updates, Ecology No.16-06-001
– Minimum Buffer Width Reduction		
.110.7	<ul style="list-style-type: none"> ▪ No change suggested, unless include a specific minimum buffer widths in each of the buffer averaging and buffer width reduction subsections. 	Wetland Guidance for CAO Updates, Ecology No.16-06-001
– Allowed Activities in Wetland Buffer Zone		
.110.8	<ul style="list-style-type: none"> ▪ Once confirm edits to buffer averaging and buffer width reduction subsections above, determine that maintaining 50 percent of the buffer width is consistent with other parts of the chapter. ▪ Define a “significant” tree. ▪ Updated with 2014 wetland rating habitat scores. ▪ Determine if want to add more specifics on what constitutes degrading a wetland buffer, as per the Clark County Code. 	Wetland Guidance for CAO Updates, Ecology No.16-06-001
– Mitigation Standards		
.110.9	<ul style="list-style-type: none"> ▪ Consider adding mitigation sequencing to the beginning of this section. Example text from Ecology’s mitigation manual is provided in chapter. ▪ Function and values of wetland citations should be Ecology’s credit/debit method. Wetland rating system could also be used. ▪ Determine if want to include text for location of wetland mitigation, e.g. on-site, off-site, in-kind, out-of-kind. Could be placed before or after the wetland mitigation banking subsection. ▪ Changed “qualified wetland specialist” to “qualified expert” to match the definitions both in this subsection and other parts of the chapter. If the City prefers “qualified wetland specialist” then will need to add to the definitions. 	Mitigation in Washington State, Parts 1 & 2 Ecology No. 06-06-011a&b and Calculating Credits and Debits, Ecology No. 10-06-11.
– Wetland Delineation		
.110.10	<ul style="list-style-type: none"> ▪ Updated with most recent Corps’ manual. ▪ Consider deleting the Ecology delineation manual; RCW90.58.380 refers the Corps and EPA, but not Ecology. 	Corps Regional Supplement: Western Mountains, Valleys, and Coast Region, 2010

17.10.120 Fish and Wildlife Habitat Conservation Areas

SUBSECTION	REVIEW COMMENT / RECOMMENDATION	BAS REFERENCES
– Designation of Critical Fish and Wildlife Habitat Conservation Areas		
.120.1	<ul style="list-style-type: none"> Make certain that the FWHCA definition is accurate per the Critical Areas Assistance Handbook critical areas checklist. Update text under Habitat Classification 3. Find out if a list of locally important species exists. Review PHS data from WDFW. Determine if should add aspen stands or oak woodland definition to table. 	WDFW PHS, August 2008 PHS data specific to City limits from WDFW PHS request; and Critical Areas Assistance Handbook: Protecting Critical Areas, CTED 2007
– Development of Performance Standards		
.120.2	<ul style="list-style-type: none"> Consider adding mitigation sequencing language. Confirm accuracy of the following: "To the maximum extent feasible, enhancement shall be undertaken onsite." Greater functional lift achieved through establishing habitat connectivity with existing habitat area or using a mitigation bank and federal rules (33CRF part 332) favor mitigation banking in most circumstances. Cite habitat conservation areas table when referring to habitat management plans for the different habitat classifications. 	WDFW Management Recommendations and Critical Areas Assistance Handbook: Protecting Critical Areas, CTED 2007
– Overlap of Critical Areas		
.120.3	<ul style="list-style-type: none"> No changes suggested. 	None
– Habitat Management Plan for Classifications 1 and 2		
.120.4	<ul style="list-style-type: none"> Cite habitat conservation areas table when referring to habitat management plans for the different habitat classifications. 	WDFW Management Recommendations
– Habitat Management Plan for Classification 3		
.120.5	<ul style="list-style-type: none"> Cite habitat conservation areas table when referring to habitat management plans for the different habitat classifications. 	WDFW Management Recommendations
– Habitat Management Plan for Classifications 4 and 5		
.120.6	<ul style="list-style-type: none"> Cite habitat conservation areas table when referring to habitat management plans for the different habitat classifications. 	WDFW Management Recommendations
– Riparian Zones		
.120.6	<ul style="list-style-type: none"> Seems as if WAC definition should be reorganized to make it more readable. No change to the content of the definition is proposed. Consider adding local shorelines examples to stream type table to make it locally relevant. 	WDFW Management Recommendations
– New subsection: allowed uses and/or functionally isolated buffers		
.120.X	<ul style="list-style-type: none"> Consider adding section for functionally isolated buffer. 	None

17.10.130 Frequently Flooded Critical Areas

SUBSECTION	REVIEW COMMENT / RECOMMENDATION	BAS REFERENCES
– Classification		
.130.1	<ul style="list-style-type: none"> ▪ Omit “critical” from title of section. ▪ Update to most current FEMA Flood insurance Rate Maps. 	Flood Insurance Study, FEMA 2015 and Model Ordinance FIP-ESA, FEMA 2012
– Designation		
.130.2	<ul style="list-style-type: none"> ▪ Confirm RCW and LMC citations are correct. 	Model Ordinance FIP-ESA, FEMA 2012
– Development Limitations		
.130.3	<ul style="list-style-type: none"> ▪ Confirm that Chapter 17.24 LMC is not changing or being updated. 	Model Ordinance FIP-ESA, FEMA 2012

17.10.140 Geologically Hazardous Areas

SUBSECTION	REVIEW COMMENT / RECOMMENDATION	BAS REFERENCES
	<ul style="list-style-type: none"> ▪ Analysis is provided by Earth Engineers, Inc. in an accompanying report. 	See accompanying report.

17.10.150 Critical Aquifer Recharge Areas (CARAs)

SUBSECTION	REVIEW COMMENT / RECOMMENDATION	BAS REFERENCES
Opening paragraph/introduction		
	<ul style="list-style-type: none"> ▪ Consider omitting if the information isn’t essential. If kept, will need to edit source of major municipal water supply. 	None
– Regulated aquifer recharge areas		
.150.1	<ul style="list-style-type: none"> ▪ Correct WAC citation. 	Critical Aquifer Recharge Areas, Ecology No. 05-10-028
– Critical aquifer recharge areas		
.150.2	<ul style="list-style-type: none"> ▪ Determine if need to update classifications to include <i>wellhead protection areas, sole source aquifers, susceptible groundwater management areas, special protection areas, and moderately or highly vulnerable aquifer recharge areas.</i> 	Critical Areas Assistance Handbook: Protecting Critical Areas, CTED 2007 and Critical Aquifer Recharge Areas, Ecology No. 05-10-028

– Permitted Activities		
.150.3	▪ No change suggested.	None
– Aquifer Impact Reporting Requirement		
.150.4	▪ No changes suggested.	Critical Areas Assistance Handbook: Protecting Critical Areas, CTED 2007 and Critical Aquifer Recharge Areas, Ecology No. 05-10-028
– Prohibited Uses		
.150.5	▪ Define what a <i>Level 2 AIAR report</i> is in (e).	Critical Areas Assistance Handbook: Protecting Critical Areas, CTED 2007 and Critical Aquifer Recharge Areas, Ecology No. 05-10-028

17.10.160 Mitigation Plan Performance Standards

SUBSECTION	REVIEW COMMENT / RECOMMENDATION	BAS REFERENCES
– Mitigation Planning Requirements		
.160.1	<ul style="list-style-type: none"> ▪ Consider moving this section to Chapter 17.12. Note that Habitat Management Plans are described in Chapter 17.12, so seems logical that wetland mitigation plans should be grouped in that chapter. ▪ Possibly reiterate mitigation sequencing steps. ▪ Is it the <u>Department</u> or <u>Director</u> that has the authority? Determine if this needs to be consistent and edit globally. ▪ Standardize language for technical assessment/critical area reports. There is discrepancy throughout this chapter. ▪ Insert language from <i>Developing Mitigation Plans</i>, Ecology 2006. Needs to be modified for City's purposes, e.g. determine if want to require bonding. ▪ On-site permittee-responsible mitigation is not necessarily the preferred option. Considering updating language per 33 C.F.R. § 332. ▪ Determine if need to expand upon the restoration requirement and specify that a restoration plan will be required. If so, will need to define the elements. ▪ Determine if want to include language for "advance mitigation." ▪ Eliminate repetitive language about "mitigation plans shall be approved by the Department" in (viii). ▪ Group all the monitoring report requirements together for clarity. 	<p>Mitigation in Washington State, Parts 1 & 2 Ecology No. 06-06-011a&b; Calculating Credits and Debits, Ecology No. 10-06-11; and Wetland Guidance for CAO Updates; Ecology No. 16-06-001.</p>

17.10.170 Strategic Plan for Protecting Aquatic Habitat

SUBSECTION	REVIEW COMMENT / RECOMMENDATION	BAS REFERENCES
– Intent		
.170.1	▪ Confirm that this section is necessary. Otherwise, no changes suggested.	None
– Goal		
.170.2	▪ If section is kept, then add <i>aquatic habitat</i> to definitions.	None
– Purpose		
.170.3	▪ No changes suggested.	None

SUBSECTION	REVIEW COMMENT / RECOMMENDATION	BAS REFERENCES
17.10.180 Variances		
.180	▪ Add LMC code reference for mitigation plans in 3.a.	None
17.10.190 Appeals		
.190	▪ No changes suggested.	None
17.10.200 Penalties and Enforcement/Violations		
.200	▪ Determine if need to define a <i>class 2 civil infraction</i> . RCW 7.80 discusses, but does not define class 2 infractions.	None
17.10.210 Liability for Damages		
.210	▪ No changes suggested.	None
17.10.220 Severability		
.220	▪ No changes suggested.	None
17.10.230 Amendments		
.230	▪ Change language from “time to time” to “periodically.”	None
17.10.240 Relationship to Other Regulations		
.240	▪ Eliminate this section and group it instead with LMC 17.10.040 Applicability and relationship to other regulatory agencies.	None

Chapter 17.12 Standards for Preparing Plans and Assessments for Critical Areas

SUBSECTION	REVIEW COMMENT / RECOMMENDATION	BAS REFERENCES
17.12.005 Information - Use		
.005	<ul style="list-style-type: none"> Need to establish consistent language for what the reports, assessments, studies, or plans are to be called. Determine and then globally change in Chapters 17.10 and 17.12. 	None
17.12.010 Wetland Assessment		
.010	<ul style="list-style-type: none"> Consistency of terms. Note that a "wetland assessment" is called a "wetland delineation report" in Chapter 17.10. Need to determine terms and then globally change in both chapters. Re-organize so that the written report requirements are listed first. Specify "USGS quadrangle map" for the "vicinity map." Possibly provide a distance to review for critical areas off-site, e.g. 300 feet. This might need to be placed at the beginning of the section so that it applies to all critical area assessments. Update with current Ecology wetland rating system and Corps' regional supplement. Recommend specifying that the site be clearly depicted on the various maps that are required. Change "topographical variations" to "topographical <u>elevations</u>." Expand site characteristics to include greater specificity on what is required. Use Ecology's <i>Wetland Guidance for CAO Updates</i> as an example. 	<p>Corps Regional Supplement: Western Mountains, Valleys, and Coast Region, 2010; Wetland Rating System for Western Washington: 2014 update, Ecology No.14-06-029; and Wetland Guidance for CAO Updates, Ecology No.16-06-001</p>
17.12.020 Habitat Management Plan Requirements		
.020	<ul style="list-style-type: none"> Consider adding a new subsection with the requirements for a fish and wildlife habitat conservation areas assessment. Eliminate "requirements" from the section's title. None of the other plans or assessments list it. Buffers around fish and wildlife habitat conservation areas can be problematic unless their widths are clearly specified, as they are for streams. Decide if need to modify 1.f and temper or eliminate the requirement for buffers around fish and wildlife habitat conservation areas. 	<p>Corps Regional Supplement: Western Mountains, Valleys, and Coast Region, 2010; Wetland Rating System for Western Washington: 2014 update, Ecology No.14-06-029; and Wetland Guidance for CAO Updates, Ecology No.16-06-001</p>
17.12.030 Geotechnical Assessments		
.030	<ul style="list-style-type: none"> Analysis is provided by Earth Engineers, Inc. in an accompanying report. 	See accompanying report.

SUBSECTION	REVIEW COMMENT / RECOMMENDATION	BAS REFERENCES
17.12.040 Erosion Hazard Assessments		
.040	<ul style="list-style-type: none"> Analysis is provided by Earth Engineers, Inc. in an accompanying report. 	See accompanying report.
17.12.050 Hydrogeologic Testing and Site Evaluation		
.050	<ul style="list-style-type: none"> Details for report contents are slim; decide if want to require more information, see Cowlitz County Code for example language. Determine if this section needs to be reviewed by a hydrogeologist. 	Critical Areas Assistance Handbook: Protecting Critical Areas, CTED 2007 and Critical Aquifer Recharge Areas, Ecology No. 05-10-028



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June 26, 2016

Ecological Land Services, Inc.
1157 3rd Avenue, Suite 220
Longview, Washington 98632
Attention: Mara McGrath, PWS

Phone: 360-578-1371
Fax: 360-414-9305
E-mail: mara@eco-land.com

**Subject: Geotechnical Review of City of Longview, Washington's 2009 Critical Areas Ordinance, No. 3082
EEI Report No. 15-066-1**

Dear Ms. McGrath:

Earth Engineers, Inc. (EEI) has completed a geotechnical review of the City of Longview's Critical Areas Ordinance (CAO). Our geotechnical review was accomplished in general accordance with EEI Proposal No. 15-P113 dated April 22, 2015, which was authorized by Francis Naglich of Ecological Land Services (ELS) on April 27, 2015.

PROJECT DESCRIPTION

We understand ELS has been retained by the City of Longview to review and assist with updating the City's CAO. This Ordinance was mandated by the State of Washington Growth Management Act (GMA) Revised Code of Washington (RCW) Section 36.70A.060 and requires all cities and counties to designate critical areas and adopt development regulations related to these areas. The GMA also requires all cities and counties to periodically update ordinances designating and defining levels of protection for "critical areas." Part of the review includes the Geologically Hazardous Areas section of the Ordinance, which requires geotechnical expertise. As such, we have been retained as a subconsultant to ELS to review the Geologically Hazardous Areas section of the CAO. Geologically hazardous areas are currently defined in Section 17.10.020.D of the CAO as areas susceptible to the effects of:

- Erosion
- Sliding
- Earthquake
- Ground swelling
- Other geological events

PURPOSE AND SCOPE OF SERVICES

Our scope of services included a detailed geotechnical review of the following City of Longview CAO sections:

Table 1: List of City of Longview CAO sections reviewed

17.10.020 – Title and Purpose
17.10.050 – Definitions
17.10.060 – Applicability/Regulated Activities
17.10.100 – Critical Area Inventory Maps
17.10.140 – Geologic Hazard Areas
17.12.030 – Geotechnical Assessments
17.12.040 – Erosion Hazard Assessments

The purpose of our review was to determine if the *Best Available Science* is being applied. As defined in Section 17.10.050 of Longview's CAO, the Best Available Science means an information source which has:

1. undergone scientific peer review and has been published in a scientific journal or unpublished;
2. a single or group of qualified scientific experts with advanced degrees or professional credentials earned in pertinent scientific disciplines, offering his/her/their best professional judgment;
3. state and federal natural resource agencies guidance documents and/or model ordinance language; and/or
4. any new technically credible information as it relates to this chapter and development.

BACKGROUND

Since their inception, the building codes have provided a level of protection to the public regarding new development. The codes have required a geotechnical engineering report when certain thresholds were met. For example, if foundations were designed using values higher than the presumptive bearing capacities provided in the code, or if deep foundations were used to support a structure. There was gap in the system where projects designed with shallow foundations using code prescribed presumptive bearing capacities could be developed without a geotechnical engineering report. Over time, there were numerous structure failures that were related to geologic hazards that went undetected during the permitting process because a geotechnical engineering study was not performed. Another tool needed to be implemented to identify geologic hazards that could impact public safety and welfare. This tool is the CAO. The CAO intent is to provide the public and City staff a map of known geologic hazards so that it can be determined which projects are located in hazard areas. Rather than focus on the foundation type and loading to decide if a geotechnical engineering evaluation was necessary per the building codes, the mapping in the CAO would act as a filter to determine when a geotechnical engineering evaluation was necessary.

As the City of Longview contemplates the update of the geologic hazard section of its CAO, we would suggest that the overarching intent of the ordinance language be to (1) provide a tool for identifying possible geologic hazards, and (2) requiring geotechnical engineering recommendations for mitigating those hazards.

LITERATURE REVIEW

As part of our review of Longview's CAO, we completed a search of available references to determine if the Best Available Science is being applied. The primary public agencies that provide geohazard related publications applicable to the City of Longview are the Washington State Department of Natural Resources (WDNR) and the US Geological Survey (USGS). We reviewed publication lists for both agencies and identified the following key documents from these 2 agencies to include in our evaluation of the Best Available Science:

Table 2: Key Public Agency References Used to Evaluate Best Available Science

Erosion Hazard	2006 "Digital Landslide Inventory for the Cowlitz County Urban Corridor Washington" (Wegmann, 2006b) Soil Survey of Cowlitz County, Washington (Pringle and Evans, 2006)
Landslide Hazard	2006 "Digital Landslide Inventory for the Cowlitz County Urban Corridor Washington" (Wegmann, 2006b)
Liquefaction Hazard	2004 "Liquefaction Susceptibility Map of Cowlitz County, Washington" (Palmer, 2004)
Volcanic Hazard	"Volcanic-Hazard Zonation for Mount St. Helens, Washington, 1995" (Wolfe and Pierson, 1995)
Earthquake Fault Hazard	"2004 USGS Quaternary Fold and Fault Database for the United States, Hoquiam 1° x 2° Sheet" (USGS, 2004)
Coal Mine Hazard	None

It was apparent during our review process that there has been much advancement in the transfer of available data to the web. WDNR has developed an interactive website that appears to be the most comprehensive, see Table 3 below. It appears this mapping website is intended to be a central clearinghouse for hazard data.

Table 3: Key Interactive Website Resource to Evaluate Best Available Science

Erosion Hazard	Washington State Department of Natural Resources Geologic Information Portal http://www.dnr.wa.gov/geologyportal
Landslide Hazard	
Liquefaction Hazard	
Volcanic Hazard	
Earthquake Fault Hazard	
Geologic Hazard	
Coal Mine Hazard	

As part of our last CAO review for the City of Longview in 2006-2007, we contacted Karl Wegmann, the author of what we judge to be the most important and current landslide hazard document published to date for Cowlitz County—the 2006 digital landslide inventory for Cowlitz County. We inquired as to whether, in his professional opinion, there was any Best Available Science that was not included in his study due to schedule or budget limitations. He responded that LIDAR mapping and instrumentation of selected large, deep-seated landslides across the study area were two tools he would have included to improve the report. He also confirmed, as stated in his 2006 report, that he was not provided any private geotechnical reports for review by the City of Longview staff. The cities of Kelso, Kalama and Woodland did provide copies of reports and that data was included in the 2006 mapping (Wegmann, 2006a; Wegmann, 2006b).

LIDAR (LIght Distance And Ranging, also known as Airborne Laser Swath Mapping or ALSM) is a relatively new technology that employs an airborne scanning laser rangefinder to produce accurate topographic surveys of unparalleled detail. The emergence of this commercial airborne laser mapping was inspired by NASA technology research and development. The uniqueness of this technology is that it can “see” through dense vegetative cover and map the topography of the ground surface (Puget Sound LIDAR Consortium website, 2006). Landslide scarps and deposits, and crustal faults located in heavily forested areas that were not possible to identify before with traditional aerial mapping now have the potential to be located (see Figures 1 and 2 below). For additional information, refer to <http://www.oregongeology.com/sub/quarpub/CascadiaFall2006.pdf>.



Figure 1: Traditional aerial photo

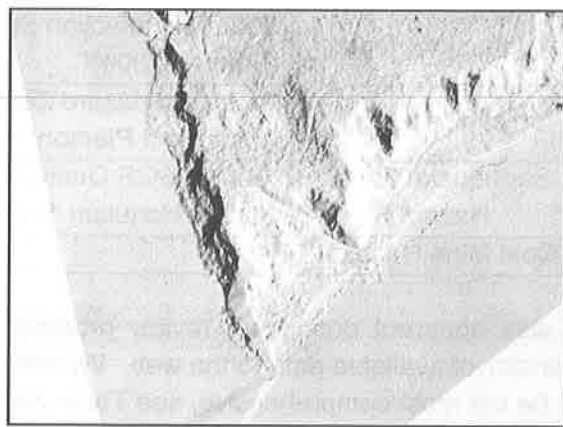


Figure 2: LIDAR topographic map

Instrumentation of selected large, deep-seated landslides would better assess the activity (or lack of activity) and the hazard potential of the known, large, ancient landslide areas. However, this would be a complex and expensive task that is not typically expected to be undertaken by the City.

It is our understanding that neither LIDAR mapping nor instrumentation of select large, deep-seated landslides has occurred to date. This is not a surprise as the relatively high cost to implement either of these tools is likely to be cost prohibitive for the City of Longview. According to the WDNR website (<http://www.dnr.wa.gov/lidar#current-projects>), the Washington State Legislature did mandate in 2015 that the Department of Natural Resources Division of Geology and Earth Resources collect and publicly distribute LIDAR mapping for the entire state.

So it does appear that LIDAR data will be available to the City at some point in the future. According to the WDNR website, LIDAR mapping of 2,424 square miles of area in Southwest Washington is planned to be mapped in 2016-2017, but it is not clear if that mapping will include the City of Longview or not.

To aid in our review of available literature, we also reviewed the following critical area ordinances from other similar jurisdictions:

Table 4: List of CAOs reviewed from other Jurisdictions

JURISDICTION	EFFECTIVE DATE
Burien, Washington	January, 2015
Camas, Washington	2008
Cowlitz County, Washington	April 7, 2009
Lewis County, Washington	2008
Stevenson, Washington	November 2, 2008
Thurston County, Washington	July 24, 2012
Vancouver, Washington	2007

CONCLUSIONS AND RECOMMENDATIONS

I. Best Available Science for Geologically Hazardous Categories

Based on our review outlined above, the following are our conclusions and recommendations regarding each of the geologically hazardous area categories when considering Best Available Science.

- Erosion Hazard.** In our professional opinion, the Soil Survey of Cowlitz County (Pringle and Evans, 2006) and the WDNR Geologic Information Portal (<http://www.dnr.wa.gov/geologyportal>) are the Best Available Science for identifying potential erosion hazard areas. Note that the interactive mapping does not specifically designate erosion hazard. The erosion hazard is included anywhere that landsliding is a hazard. We recommend the CAO be updated using this information.
- Sliding Hazard.** In our professional opinion, the 2006 digital inventory report for Cowlitz County by Karl Wegmann (Wegmann, 2006b) and the WDNR Geologic Information Portal are the Best Available Science. Both resources show numerous landslides throughout the City of Longview. We recommend the CAO be updated using this information. We should caution that the landslide database for Longview is incomplete. Based on our experience working in Longview, there are recent and ongoing landslides in areas of Longview that are not currently mapped. We recommend consideration be given to compiling a database of past and future private geotechnical consulting reports submitted to the City of Longview, and that these reports be reviewed by an experienced geotechnical professional and included in the geologically hazardous areas mapping used by the City. These reports may indicate areas that should be included as a hazard

but are not, or might eliminate the need for some areas to be allocated within the mapped hazard.

In our 2007 review of the Critical Areas Ordinance, we had recommended updating the Critical Areas Ordinance once LIDAR maps for the Longview area are made public. Like what happened in the greater Seattle area, these maps could totally redefine the application of erosion and sliding hazard mapping in Longview. While the State of Washington has mandated that the entire state be LIDAR mapped, that has not happened yet for the City of Longview. As such, we recommend that the Critical Areas Ordinance consider LIDAR mapping during the next CAO update.

2. **Earthquake Hazard.** In our professional opinion, the liquefaction susceptibility hazard map (Palmer, 2004), earthquake fault database (USGS, 2004), and the WDNR Geologic Information Portal are the Best Available Science. The liquefaction mapping indicates a moderate to high risk within nearly all of the low lying areas of Longview. The geotechnical earthquake engineering evaluation used to develop this map was limited to a basic assessment of the age and type of soil deposits previously mapped, which is likely to be conservative. The evaluation did not include detailed liquefaction calculations based on actual soil samples.

While this is considered the Best Available Science, it is lacking because detailed liquefaction studies previously conducted in the area by private parties and submitted to the City as part of development applications were not included when evaluating liquefaction susceptibility. To further define the liquefaction hazard potential, we would recommend developing a database of past and future private geotechnical consulting reports submitted to the City of Longview, and that these reports be reviewed by an experienced geotechnical professional and included in the geologically hazard area mapping used by the City. It is possible that by developing a database of mapped liquefiable areas by reviewing past geotechnical engineering studies, the areas of liquefaction hazard may be better defined.

3. **Ground Swelling Hazard.** We did not locate any literature or maps that indicated ground swelling (i.e. expansive soils) is a hazard in Longview. We do not have any recommendations for adding areas of Longview to the geologic hazard areas based on a ground swelling hazard.
4. **Other geological events.** The primary concern that falls into this category would be volcanic hazards from future eruptions of Mount St. Helens. The Volcanic-Hazard Zonation for Mount St. Helens, Washington (Wolfe and Pierson, 1995) and WDNR interactive mapping indicate that there are lahar and ash fall hazards that could impact Longview. The lahar hazard is primarily focused along the Cowlitz River while ash fall could impact the entire city.

II. Critical Areas Ordinance Language

The following are our review comments related to each specific section of Longview's CAO. Where we provide suggested edits to the existing CAO language, we show text bracketed by quotations—additions are underlined and deletions noted with a strikeout line.

Section 17.10.050 – Definitions

1. We noted a conflict between the language in Section 17.10.050 and 17.12.030. Section 17.10.050 allows for either a Geotechnical Engineer, Geologist, Engineering Geologist, or Hydrogeologist to perform a Geotechnical Assessment. Section 17.12.030 only allows a Geotechnical Engineer to perform a Geotechnical Assessment. In reviewing the Critical Areas Ordinances of other jurisdictions, it appears that some jurisdictions allow for either a Geotechnical Engineer, Geologist, or Engineering Geologist to prepare the Geotechnical Assessment. In some cases, the jurisdiction limited it to either a Geotechnical Engineer or Engineering Geologist (i.e. a Geologist was not approved to be the design professional). We recommend the City determine whether they want to exclude Geologists from being able to perform Geotechnical Assessments and then we would be available to assist in revising the ordinance language as necessary.

When considering whether to exclude Geologists or not, we would offer that the CAO requires Geotechnical Assessments and Geotechnical Reports to include geotechnical engineering (reference Section 17.12.030). A Geologist may not be qualified to provide geotechnical engineering recommendations.

Finally, the definition of a Geologist currently includes those who are registered as a Geologist, Engineering Geologist, or Hydrogeologist. We recommend consideration be given to separating those 3 terms with their own definition. Each of these 3 professions has their own qualifications and registration requirements and it may not be appropriate to lump them all into the category of "Geologist."

We are not providing suggested revisions to the ordinance language at this time. Our recommendations will affect who is a Qualified Expert. In some cases, those who have been Qualified Experts in the past may no longer be qualified. As such, we recommend the City review our recommendations and decide on a direction. Our recommendation would be that only Geotechnical Engineers and Engineering Geologists be considered as Qualified Experts for Geotechnical Assessments and Geotechnical Reports—this would be consistent with those professions that are experienced in providing engineering recommendations. Should the City decide to move forward with our suggestions, we can provide revised ordinance language.

Section 17.10.100 – Critical Area Inventory Maps

1. In the Summary of Map Sources table, we recommend the Geologically Hazardous Areas section of the table be modified to include new bullet point #6.

TOPIC	MAP/DATA SOURCE(S)
Geologically Hazardous Areas	<ol style="list-style-type: none"> 1. Digital Landslide Inventory for the Cowlitz County Urban Corridor, Washington, Washington Division of Geology and Earth Resources, Washington State Department of Natural Resources, May 2006 (Wegmann, 2006b) 2. Liquefaction Susceptibility Map of Cowlitz County, Washington, Division of Geology and Earth Resources, Washington State Department of Natural Resources, September 2004 (Palmer, 2004) 3. 2004 USGS Quaternary Fold and Fault Database for the United States, Hoquiam 1° x 2° Sheet (USGS, 2004) 4. Volcanic-Hazard Zonation for Mount St. Helens, Washington, 1995 (Wolfe and Pierson, 1995) 5. Soil Survey of Cowlitz County, Washington (Pringle and Evans, 2006) or as amended (for erosion hazard only, as discussed in Section 17.10.140) 6. Washington State Department of Natural Resources Geologic Information Portal, http://www.dnr.wa.gov/geologyportal

Section 17.10.140 – Geologic Hazard Areas

1. Section 17.10.140(1) requires a Geotechnical Assessment for all regulated activities proposed within geologic hazard areas, including landslide, erosion or mine hazards. We recommend the language be revised to include all of the applicable geologic hazards (i.e. add earthquake and volcanic hazards). We also recommend revising the reference to the building code. Currently it references the International Building Code, however some projects may be developed under the International Residential Code. Finally, the current language states that only a Geotechnical Engineer is a Qualified Expert. This is not consistent with the definition of a "Geotechnical Assessment," which states that a Geotechnical Engineer or Geologist is qualified. As discussed on page 7 of our report, our recommendation would be to change the language to state that both a Geotechnical Engineer and Engineering Geologist are qualified.

"For all regulated activities proposed within designated landslide, erosion, earthquake, volcanic, or mine hazard areas, a geotechnical assessment or an erosion hazard assessment, as appropriate, prepared by a Geotechnical Engineer or Engineering Geologist in accordance with the standards contained in LMC 17.12.030 and/or 17.12.040, and shall be submitted with the development permit application and coordinated with the international applicable building code requirements."

2. Revise Section 17.10.140(4)(e)(i) to allow for either a Geotechnical Engineer or Engineering Geologist to provide setback recommendations in order to be consistent with the definition of who is qualified to perform a Geotechnical Assessment per Section 17.10.050.

"The buffer may be less than 50 feet if recommended in a geotechnical report by a qualified Geotechnical Engineer or Engineering Geologist, and approved pursuant to LMC 17.10.072(6)."

3. Revise Section 17.10.140(5) to include the new WDNR interactive map, which we consider to be Best Available Science (reference Table 3 above).

"Areas mapped in the moderate to high risk category on the Liquefaction Susceptibility Map of Cowlitz County, Washington, or the WDNR Interactive Map, should be considered in a Seismic Hazard Area."

4. Revise the reference to the building code in Section 17.10.140(6). Currently it references the International Building Code, however some projects may be developed under the Residential Building Code.

"All development within areas that meet the classification for seismic hazard areas shall comply with the currently adopted, applicable International Building Code."

5. Modify the language in Section 17.10.140(8) to reference the newly developed WDNR Geologic Information Portal, which we consider to be the Best Available Science for mine hazard areas. No abandoned coal mines are mapped in the city of Longview.

"At this time, the Washington Department of Natural Resources Geologic Information Portal (<http://www.dnr.wa.gov/geologyportal>) has no record of any mine hazard areas in or immediately adjacent to the city of Longview."

6. Revise the language in Section 17.10.140(9) to reference the newly developed WDNR Geologic Information Portal, which we consider to be the Best Available Science for volcanic hazard areas.

"For the purposes of this classification, all volcanic mudflow hazard areas shall be identified as the 500-year floodplain areas identified in FEMA maps, or identified as a volcanic hazard by the WDNR Geologic Information Portal."

Section 17.12.030 – Geotechnical Assessments

1. First of all, we should point out that a portion of the Section 17.12.030(1) appears to have been mistakenly deleted when the CAO was last updated in 2009. The following is the deleted text, which we are recommending be added back in.
 3. Site evaluation: evaluation of the ability of the site to accommodate the proposed activity.
 4. Site history: description of any prior grading, soil instability, or slope failure.
 5. Seismic hazard: data concerning the vulnerability of the site to seismic events.
 6. Geo-technical Engineering Information required:
 - a. slope stability studies and opinion of slope stability:
 - b. proposed angles of cut and fill slopes and site grading requirements:
 - c. structural foundation requirements and estimated foundation settlements:
 - d. soil compaction criteria:
 - e. proposed surface and subsurface drainage:
 - f. ~~erosion~~ vulnerability of site:
 - g. building limitations.
2. Section 17.12.030 is titled "Geotechnical Assessments," but it actually addresses 2 different reports that could be submitted as part of a Critical Areas Permit application:
 - (1) Geotechnical Assessment
 - (2) Geotechnical Report

The title of this section could be confusing and we recommend it be revised to reflect the fact that there are 2 different types of reports covered under this section. However, rather than renaming this section to "Geotechnical Assessments and Geotechnical Reports," we recommend it be renamed to "Geotechnical Reconnaissance and Geotechnical Investigation Reports." We believe this will provide the City, the public, and the practitioners more clarity. By definition, the only apparent difference between the 2 scopes is that a Geotechnical Assessment only requires a site reconnaissance in order to complete the report, whereas the Geotechnical Report requires a subsurface investigation (i.e. borings, test pits, cone penetration tests, or other subsurface investigation method). As such, we recommend this section be rewritten so that it is clear that there are 2 different reports and what the difference is between them. Should the City agree with this approach, we can rewrite this section.

To take it even further, we suggest the ordinance language be revised to make it clear as to when a Geotechnical Reconnaissance report will be required and when a Geotechnical Investigation report will be required. Because a Geotechnical Reconnaissance does not include a subsurface investigation, we would suggest that any site located within (1) a moderate or severe liquefaction hazard or (2) a landslide hazard require a Geotechnical Engineering Report. These hazards cannot be adequately evaluated without site specific subsurface data and would be best evaluated by performing the more detailed Geotechnical Investigation Report.

Erosion hazards can generally be evaluated by a surface reconnaissance. Volcanic hazards and earthquake fault hazards typically rely on literature research. All of these hazards are generally not as dependent upon site-specific subsurface data, and therefore we would suggest that the minimum requirement be a Geotechnical Reconnaissance, which may need to be supplemented with a Geotechnical Investigation Report if recommended by the Qualified Expert. The Geotechnical Investigation report could either be performed as a supplement to the Geotechnical Reconnaissance, or the Geotechnical Investigation report could be performed in lieu of the Geotechnical Reconnaissance.

3. We recommend revising Section 17.12.030(2) to have the same report requirements as 17.12.030(1), with the additional requirements of reporting the site specific subsurface exploration and laboratory testing data. Also, language regarding a slope stability study should be included if the site is located in a landslide hazard area and a liquefaction study should be included if the site is located in a liquefaction hazard area.

Section 17.12.040 – Erosion Hazard Assessments

It is not entirely clear to us why there is a separate erosion hazard section, when the erosion hazard areas are already addressed in Section 17.12.030. There is no definition of an Erosion Hazard Assessment or who is qualified to perform one in the definitions section of Section 17.10.050. It is not clear to us what would trigger the City to require a report complying with this section. It may be worth inquiring with City staff to find out if any reports have been submitted per the requirements of this section. If the City feels there is a clear need for this section to remain, then the definitions in Section 17.10.050 should be updated to define an Erosion Hazard Assessment and who is qualified to perform one.

SUMMARY

In summary, we have identified the following issues related to the update of the CAO:

1. Based on our review of Best Available Science, we are recommending that one new reference be included to evaluate the geologically hazardous areas in Longview: WDNR Geologic Information Portal (<http://www.dnr.wa.gov/geologyportal>).

2. While the State of Washington has recently required that the entire state be evaluated for landslide hazards using LIDAR mapping, it does not appear that mapping within the city of Longview will occur prior to the next adoption of the CAO. As such, we are recommending that during the next round of the CAO update, the state's LIDAR mapping be reviewed to see if it can be included as Best Available Science.
3. We are providing some general ordinance language cleanup to address some minor inconsistencies.
4. We are recommending the City consider a major shift in its policy by defining who is a Qualified Expert for addressing geologic hazards. Because the report includes geotechnical engineering recommendations, we are recommending that Geologists and Hydrogeologists no longer be Qualified Experts.
5. We are recommending that the City consider another major shift by renaming the reports that are required for identifying and mitigating geologic hazards. We are suggesting that a Geotechnical Assessment be renamed to Geotechnical Reconnaissance and a Geotechnical Report be renamed to Geotechnical Investigation. The new names will better describe the scope of work required.
6. The final major shift in City policy, is our recommendation that the City consider defining when a Geotechnical Reconnaissance report is required and when a Geotechnical Investigation report is required. Essentially, we are suggesting that if the geologic hazard can generally be evaluated without collecting site specific subsurface data, then a Geotechnical Reconnaissance is appropriate. Volcanic and earthquake fault hazards generally meet this requirement. Some hazards (i.e. landslide and liquefaction) are difficult to evaluate without site specific subsurface information. As such, we are recommending that the ordinance be revised to require a Geotechnical Investigation report within these hazard areas. Should the City agree with our recommendation, the consequence is that for properties mapped in landslide hazard or liquefaction hazard areas, they would need to do the more expensive Geotechnical Investigation. Given that much of the City is mapped in either a landslide or liquefaction hazard, it would economically impact a large percentage of stakeholders.
7. We are recommending the City look at Section 17.12.040, which addresses the requirements of an Erosion Hazard Assessment as it's not clear to us that this section is needed given that erosion hazard is already addressed in Section 17.12.030.

We envision that the next step in the process will be that EEI will work with ELS to revise the actual code language once we get feedback from the City of Longview staff about the findings and recommendations in this report.

LIMITATIONS

Our literature review was intended to be thorough and comprehensive but because there is not a common clearinghouse of technical references, it is possible that there are other references

applicable to this project that were not included in our review. Services performed by the Geotechnical Engineer for this project have been conducted with that level of care and skill ordinarily exercised by members of the profession currently practicing in this area under similar budget and time restraints. No warranty, expressed or implied, is made.

This report is for the exclusive use of Ecological Land Services, Inc. and the City of Longview. The data, analyses and recommendations may not be appropriate for other purposes. We recommend that parties contemplating other purposes contact us. In the absence of our written approval, we make no representation and assume no responsibility to other parties regarding this report. Should you have any questions or need additional services, please contact our office at (360) 567-1806.

Sincerely,
Earth Engineers, Inc.



EXPIRES 09/06/17

Troy Hull, P.E.
Principal Geotechnical Engineer

Reviewed by:

A handwritten signature in cursive script, appearing to read "Travis Willis".

Travis Willis, P.E.
Principal Geotechnical Engineer

Attachment: References

REFERENCES

Call, Willard A, 1974. "Soil Survey of Cowlitz Area, Washington," United States Department of Agriculture Soil Conservation Service in cooperation with Washington Agricultural Experiment Station.

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