City of Lynnwood
Critical Areas Ordinance (CAO) Update
Best Available Science Review and Gap Analysis Matrix
Final, including tracking of January 2016 Draft CAO revisions

Existing CAO Provision LMC Chapter / Section	Degree of Consistency with BAS & Guidance	Reason For Lack of Consistency	Suggested Change	Rationale/ Basis for Suggested Change	CAO Revision Implementation (January 2016 Draft CAO)
General Provisions (Sections 17.10.010 through 17.10.049)					
Standard for mitigation sequencing - *None*	Inconsistent with BAS	Code does not include a mitigation sequencing requirement.	Proposed impacts to critical areas and their buffers must adhere to the mitigation sequencing steps. These steps are defined in section 17.10.030 (Definitions), but it should be clear in the CAO that mitigation sequencing is required.	CTED, 2007, and adherence to federal and state standards.	Change made
Standard for best available science - *None*	Inconsistent with BAS	Code does not include a best available science requirement.	Add a section that states that critical area reports and decisions to alter critical areas shall rely on the best available science.	CTED, 2007	Change made as suggested – instead of adding a new Section, new sentence added to existing section
17.10.010 Purpose	Inconsistent with BAS Could be revised to be more consistent with GMA.	The purpose statement does not mention frequently flooded areas and critical aquifer recharge areas. Section refers to streams and fish and wildlife habitats as separate critical areas	Frequently flooded areas and critical aquifer recharge areas must be designated and protected, per the Growth Management Act (GMA). Consider referring to streams and wildlife priority habitat areas as "fish and wildlife habitat conservation areas"; however, as long as habitats are protected and managed (especially habitats for salmonids), standards will be consistent with GMA.	Consistency with GMA. Consistency with GMA.	Change made Streams section left as standalone section (City preference)
17.10.015 General provisions	Consistent with BAS			CTED, 2007	Change made
17.10.020 Applicability	Consistent with BAS; could be revised to be more consistent with GMA guidance and for readability.	Many standards are included in this section, including provisions on critical areas mapping, regulated activities, and permit standards. Additionally, Ecology has suggested that Applicability sections include statement about compliance with other federal, state, and local regulations and permit requirements.	Split section into multiple components to improve readability of content. Include language specifying that critical areas permit approval does not constitute compliance with other federal, state, and local regulations and permit requirements.	CTED, 2007	Change made Change made
17.10.030 Definitions	Inconsistent with GMA (RCW 36.70A.030)	The definition of "wetlands" provided in LMC 17.10.030.W is not entirely consistent with the RCW / Ecology guidance definition. The definition of "critical areas" provided in LMC 17.10.030.C does not include critical aquifer recharge areas or frequently flooded areas, both of which are required to be included by GMA.	Consider updating definition of "wetland" to be consistent with RCW/ Ecology guidance.[i] Update definition to include critical aquifer recharge areas and frequently flooded areas.	*Wetlands and CAO Updates: Guidance for Small Cities* (Bunten et al., 2012) Consistency with GMA.	All changes made

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	Could be revised to be more consistent.	The definition of "buffer" provided in LMC 17.10.030.B does not exclude legally established, functionally isolated areas (for example, legally established roads / impervious surfaces or areas on the opposite side of legally establish roads.	Update definition to be more consistent with definition included in Bunten et al. 2012, and include language that excludes legally established, functionally isolated areas. After the suggested revisions are made to the CAO, consider re-visiting the definition section to make sure that the applicable terms are defined, and that the definitions are consistent with those in the GMA and its implementing regulations.	*Wetlands and CAO Updates: Guidance for Small Cities* (Bunten et al., 2012); also provides clarity to applicants and City staff	
17.10.040 Permitted uses	N/A	Section appears to not warrant standalone section, and is largely unnecessary.	Could move this regulation to the "General Provision" section (17.10.015), as those regulations are related. For clarification purposes, this regulation could be re-worded to state that the CAO regulations are applied in addition to zoning and other regulations adopted by the City; or this regulation could be simply removed.	CTED, 2007	This section determined to be unnecessary and deleted
17.10.045 Submittal requirements	N/A Inconsistent with BAS	Potential typo? Paragraph C states that for development proposals on sites that have previously underwent critical areas review and have an established critical areas buffer, these proposals shall not be subject to additional critical areas review.	Last sentence of the first paragraph; should the word "evidence" be between "substantial" and "showing"? Remove Section C.	 Per the GMA, the City's CAO will be periodically updated based upon best available science, and the required buffer widths may change during CAO updates. In accordance with the BAS requirement, new development and/or redevelopment should be subject to the standard buffers that are in place when the project is vested.	Change made Change not made per recommendation. Wording of the section updated to improve clarity, while maintaining intent (that previously legally established CAO buffers, which are protected as a separate tract/easement, should not be superseded by newly required buffer widths if increased by future CAO updates).
17.10.046 Exemptions allowed	Inconsistent with BAS	The second sentence states that the Director may exempt activities other than those specifically listed in Section 17.10.047.	Revise this to state that only the activities listed in Section 17.10.047 may be exempt from this Chapter.	CTED, 2007	Change not made per direction from City; intent is to provide the Director with opportunity to interpret listed exemptions and apply when appropriate and consistent with this section.
17.10.047 Exemptions	Inconsistent with BAS Could be revised to be more consistent.	Section A (Emergencies) states that the director "may" require mitigation for critical area impacts. Section D exempts maintenance of drainage ditches.	Revise to state that the director *shall* require mitigation, in accordance with an approved critical area report and mitigation plan. Change "drainage ditches" to "drainage ditches that do not meet the criteria for being considered a fish and wildlife habitat area."	CTED, 2007 and *Wetlands and CAO Updates: Guidance for Small Cities* (Bunten et al., 2012) recommendations. In urban environments, existing drainage ditches may be completely manmade, or may be streams that were historically	No change made per direction of the City; intent is to maintain limited flexibility for emergency actions. Change made

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	Could be revised to be more consistent.	Section K exempts small (under 2,500 SF), isolated Category III and IV wetlands that provide a low level of functions, provided that mitigation occurs.	Limit exemption to isolated Category III and IV wetlands less than 1,000 square feet in area, that are not associated with riparian areas or buffers, are not part of a wetland mosaic, and do not contain habitat for priority species.	straightened and ditched, that may still provide fish habitat. Scientific literature does not support exempting wetlands based on size or category alone, since small wetlands may perform important functions. However, Ecology has developed a strategy for exempting small wetlands when additional criteria are considered (Bunten et al., 2012).	No change made per direction of the City; intent is to maintain this allowance as is.
17.10.048 Reasonable use exception—Allowed	Consistent with BAS			CTED, 2007	
17.10.049 Reasonable use application and process	Consistent with BAS				
Wetlands (Sections 17.10.050 through 17.10.059)					
17.10.050 Wetland delineation and rating system	Inconsistent with BAS	Sections A and E reference outdated wetland delineation and rating manuals.	Revise Sections A and E to refer to the approved federal wetland delineation manual and applicable regional supplements and the Washington State Rating System for Western Washington, 2014.	The federal wetland delineation manual and regional supplements and updated 2014 wetland rating manual constitute BAS for wetland identification, delineation, and rating (WAC 173-22-035, WAC 365-190-090).	Change made
	Could be revised to be more consistent.	Section B states that wetland delineations are valid for 3 years.	Revise Section B to specify that wetland delineations are valid for 5 years.	Corps of Engineers Regulatory Guidance Letters RGL 05-02 and 08-02 set a five year standard on wetland determinations.	City elected to keep as 3 years – no change made
	Could be revised to be more consistent.	Section 17.10.045 contains general critical area reporting requirements, but there is no list of wetland-specific reporting requirements	Consider providing detailed wetland reporting requirements, in addition to the general submittal requirements listed in Section 17.10.045. For example, a wetland critical area report should contain an analysis of wetland functions.	Clarity for applicants and City staff. *Wetlands and CAO Updates: Guidance for Small Cities* (Bunten et al., 2012)	Change made to add detailed wetland reporting requirements
17.10.051 Standard wetland buffers	Inconsistent with BAS	Buffer widths are inconsistent with BAS.	Revise section to reflect recent BAS updates for buffers; for example, as shown in Table XX.1 in Ecology's wetland guidance document (Bunten et al., 2012[ii]). Ecology's example wetland buffer system contains provisions for increasing or decreasing buffer widths based upon the number of habitat points received; therefore, the corresponding language in Sections 17.10.0.56 and 17.10.057 may not be required.	*Wetlands and CAO Updates: Guidance for Small Cities* (Bunten et al., 2012)	Changes made per recent BAS provided through Bunten et al., 2012

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	Could be revised to be more consistent.	Section states that specific measures to minimize wetland impacts from adjacent land uses shall be applied, but specific measures are not listed.	Revise section to include the specific wetland impact minimization measures, as shown in Table XX.2 in Ecology's wetland guidance document (Bunten et al., 2012)	*Wetlands and CAO Updates: Guidance for Small Cities* (Bunten et al., 2012)	Change made
17.10.052 Alterations to wetlands and buffers—Allowed	Could be revised to be more consistent.	Section does not refer to mitigation sequencing requirement.	State that proposed alterations to wetland and buffers are subject to the mitigation sequencing requirement of Section 17.10.0XX	*Wetlands and CAO Updates: Guidance for Small Cities* (Bunten et al., 2012), and consistency with federal and state standards.	Change made
17.10.053 Wetland and buffer alteration criteria	N/A Could be revised to be more consistent.	Subsection 1 is already stated verbatim in Section 17.10.051. Subsection 4 states that relocated wetlands shall be located within the same sub-basin .	Remove subsection 1. As written, this subsection could preclude use of a certified ILF program or mitigation bank. Revise section to state that relocated wetlands shall be within the same sub-basin, *or* within the service area of a certified ILF program or mitigation bank.	Revise for clarity and user-friendliness. Inconsistent with current federal mitigation preference Source: *Compensatory Mitigation for Losses of Aquatic Resources. Final Rule*. (Federal Register 73(70): 19594-1970) BAS indicates that mitigation banks and ILF programs have a significantly greater likelihood of mitigation success, as opposed to permittee-responsible mitigation.	Change made Change made
17.10.054 Wetland and buffer mitigation plan	Consistent with BAS			*Wetlands and CAO Updates: Guidance for Small Cities* (Bunten et al., 2012)	Change made
17.10.055 Wetland alteration compensation	Could be revised to be more consistent. Inconsistent with BAS	The mitigation ratios are appropriate and generally consistent with BAS. This section could be clarified by adding a table with mitigation ratios for each type of mitigation action (i.e. creation, restoration, and enhancement); Ecology review may insist that differention between types of mitigation actions is necessary. There is no allowance for the use of mitigation banks and ILF programs; federal and state agencies are now requiring the use of these mitigation programs, if and when they are available.	Revise mitigation ratios to reflect the mitigation ratios recommended by Ecology, in *Bunten et al., 2012.* Allow mitigation banks and ILF programs, and consider specifying that mitigation using banks or ILF programs is preferred over permittee-responsible mitigation, if the wetland alteration falls within the service area of an existing bank or ILF program.	*Wetlands and CAO Updates: Guidance for Small Cities* (Bunten et al., 2012) Inconsistent with current federal mitigation preference Source: *Compensatory Mitigation for Losses of Aquatic Resources. Final Rule.* (Federal Register 73(70): 19594-1970) BAS indicates that mitigation banks and	Change made Change made

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				ILF programs have a significantly greater likelihood of mitigation success, as opposed to permittee-responsible mitigation.	
	Inconsistent with BAS	For permittee responsible mitigation, there is no stated preference of mitigation actions.	The preference of mitigation actions for permittee responsible mitigation should be, in this order: restoration, creation, and enhancement.	BAS indicates that wetland restoration has a better likelihood of replacing wetland functions as opposed to creation, etc. *Wetlands and CAO Updates: Guidance for Small Cities* (Bunten et al., 2012)	Change made
	Inconsistent with BAS	Ecology's *Bunten et al., 2012* guidance makes a specific mention of 10-year monitoring periods where shrubs or forested communities are being established as part of mitigation.	Make the following addition to subsection D: "*Longer periods or more stringent monitoring requirements may be required on a case-by-case basis for more complex mitigation plans.*"	Experience with Ecology review has suggested longer mitigation monitoring periods (Bunten et al., 2012).	Change made to section 17.10.054 into subsection D; separated into 2 sentences
17.10.056 Increased wetland buffer width	Could be revised to be more consistent.	If the recommended changes to 17.10.051 are made (as detailed above), then the first two paragraphs and subsection A and associated table will not be necessary.	Remove the first two paragraphs of the section, the associated table, and subsection A.	*Wetlands and CAO Updates: Guidance for Small Cities* (Bunten et al., 2012)	Changes made
	N/A	Subsection 1 is already stated verbatim in Section 17.10.051.	Remove subsection 1.	Revise for clarity and user-friendliness	
	Inconsistent with BAS	There is no provision to allow the Director to increase a wetland buffer, if and when a larger buffer is necessary to protect wetland functions and values.	The Director should have authority to increase a wetland buffer width up to 50% if the wetland contains a threatened or endangered species or the surrounding land is susceptible to severe erosion and/or steep slopes.	*Wetlands and CAO Updates: Guidance for Small Cities* (Bunten et al., 2012)	
	N/A	Regulations regarding wetland buffer widths are located in Section 17.10.051.	After the above revisions are made, consider moving the remaining subsections in this section to Section 17.10.051.	Revise for clarity and user-friendliness	
17.10.057 Decreased wetland buffer widths	Could be revised to be more consistent.	If the recommended changes to 17.10.051 are made (as detailed above), then the last two paragraphs (and associated table) in section will not be necessary. The first paragraph in this section (regarding the buffer widths of mitigation wetlands) is consistent with BAS and should remain).	Relocate the first paragraph to Section 17.10.051, and remove this section.	*Wetlands in Washington State, Volume 2: Guidance for Protecting and Managing Wetlands, Ecology Publication #05-06-008* (Granger et al. 2005); and *Wetlands and CAO Updates: Guidance for Small Cities* (Bunten et al., 2012)	Changes made (moved first paragraph to 17.10.051 and removed the rest of this section)
17.10.058 Averaging of wetland buffer widths	Consistent with BAS			*Wetlands and CAO Updates: Guidance for Small Cities* (Bunten et al., 2012).	
	N/A	Section E is already stated verbatim in	Remove subsection E.	Revise for clarity and user-friendliness	Change made (removed subsection E)

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		Section 17.10.051.			
17.10.059 Building setback lines—Wetlands	N/A	Section requires 15 foot building setback from edge of buffer, even where providing this building setback triggers the need for buffer reduction / averaging (due to site constraints and proposed development site plan).	Allow for reduced building setback width when such allowance eliminates or minimizes the need for buffer reduction / averaging.	Identified by City staff	*Updates made to provide* allowance for buffer reduction (with enhancement) – see new section 17.10.059 (Buffer width reductions through enhancement)
Streams and FWHCA (Sections 17.10.060 through 17.10.081)					
17.10.060 Stream—Rating	Inconsistent with BAS	The stream typing system is not consistent with State standards.	Replace with the State stream typing system (WAC 222-16-030). See footnote for typing system conversion table.[iii]	The State stream typing system (WAC 222-16-030) is consistent with BAS.	Change made
	Could be revised to be more consistent.	Section 17.10.045 contains general critical area reporting requirements, but there is no list of stream-specific reporting requirements	Consider providing detailed stream reporting requirements, in addition to the general submittal requirements listed in Section 17.10.045. Reporting requirements for wildlife habitats are already described in Section 17.10.081; this section could be expanded to cover stream reporting requirements (see the CTED model ordinance for example reporting requirements).	Revise for clarity to both applicants and City staff.	Change made
17.10.061 Stream buffers	Could be revised to be more consistent. Inconsistent with BAS	First paragraph states that stream buffers shall be measured from the top of the upper bank <u>or</u> from the ordinary high water mark. Sections A through C: The City's standard buffers range from 35 feet (Category III) to 100 feet (Category I). BAS supports wider standard buffers widths. BAS suggests widths from 75 feet to well over 300 feet to protect a suite of ecological functions. Upper ranges are likely not feasible given existing platting and development patterns; however recent BAS suggests 100 foot minimum standard buffers for any stream with anadromous fish use (Appendix L in Ecology, 2013).	Remove the reference to top of the bank; stream buffers should be measured only from the ordinary high water mark, as measured in the field. Consider increases to standard stream buffer widths. For example, Mountlake Terrace has buffers that range from 150 to 50 feet. 35 foot buffers are likely acceptable for Type Ns streams; however all other stream types (especially Type F streams) will likely require increased buffers. Another potential buffer options would be to require larger buffers when salmonid species are present. ESA can provide a more details and example language during the code revision process.	Consistency with federal and state standards (Corps 2014, Ecology 2010) (e.g. the state's hydraulic code) Brennan et al. 2009, May 2003, and Knutson and Naef, 1997 all suggest BAS based buffers wider than those currently required. Alternative strategies to BAS-based buffers can provide some of the ecological functions provided by riparian buffers, and should be considered (especially where narrow or reduced buffers are allowed). Appendix L in Ecology, 2013 suggest 100 foot buffers for streams with anadromous fish use.	Change made Change made to provide new stream typing system, and cross walk (see Table at the end of this document) to maintain existing buffer widths under the new typing system. Stream buffer criteria additionally provided for Type S streams.
17.10.062 Stream alteration allowed	Could be revised to be more consistent.	Section does not refer to mitigation sequencing requirement.	State that proposed alterations to streams and buffers are subject to the mitigation sequencing requirement of Section 17.10.0XX	CTED, 2007.	Change made
17.10.064 Stream mitigation plan	Consistent with BAS			CTED, 2007	
17.10.065	N/A		Consider changing title of section to "Stream Crossing	Revise for clarity.	Change made

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Culverting	Could be revised to be more consistent.	Section C states that open bottom or box culverts shall be used for the crossing of Category I streams or Category II streams with the presence of salmonids. Bottomless culverts are no longer recommended by WDFW.	Structures." In all sections, change "culverting" to "stream crossing structures." State that stream crossings shall be designed according to WDFW water crossing design guidelines.	The WDFW 2013 *Water Crossing Design Guidelines* constitutes BAS.	Change made
17.10.066 Increased stream buffer width	Consistent with BAS			CTED, 2007	
17.10.067 Decreased stream buffer width	Inconsistent with BAS	Sections A through D allow stream buffers to be reduced up to 25 percent, if the remaining buffer area is enhanced.	Remove Sections A through D.	BAS does not support blanket reductions of stream buffers. Stream buffer alteration should be restricted to the minimum possible, and only when the impact is unavoidable. Section 17.10.068 already allows buffer averaging to compensate for unavoidable impacts.	No change made; City elected to maintain this allowance
	N/A		Consider moving the first paragraph of this section (referring to the buffer width of stream mitigation areas) to Section 17.10.061.	Revise for clarity; this regulation would be more appropriate in the stream buffer code section.	Change made
17.10.068 Averaging of stream buffer widths.	Consistent with BAS			CTED, 2007	
17.10.069 Riparian wetland	Consistent with BAS			CTED, 2007	
17.10.070 Building setback line—Streams	Consistent with BAS			CTED, 2007	
17.10.080 Fish and wildlife priority habitat	Inconsistent with BAS	Section does not include all of the fish and wildlife habitat conservation area types that are listed by the GMA and its implementing regulations.	Update this section with the regulated fish and wildlife habitat conservation area types that are listed in WAC 365-190-130. Please note, habitat types that are not present within Lynnwood (such as commercial and recreational shellfish beds) should not be included in the CAO.	Compliance with GMA (WAC 365-190-130).	Change made
17.10.081 Wildlife habitat assessment	Could be revised to be more consistent.	Section describes reporting requirements for wildlife habitat assessments.	As stated above, this section could be adapted to list reporting requirements for all fish and wildlife habitat conservation areas (including streams).	Revise for clarity and consistency to both applicants and City staff.	Change made

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Geologically Hazardous Areas (Sections 17.10.090 through 17.10.094)					
17.10.090A Geologically hazardous areas-Identification	Inconsistent with BAS and Guidance	Current code does not make it clear that a geologic hazard assessment is necessary to confirm whether or not a potential area is in fact a hazard.	Add the word "potentially" before geologically hazardous in the first sentence.	Not all areas that should require a geologic hazard assessment are in fact a geologic hazard area.	All changes made per suggestions
	Inconsistent with BAS and Guidance	Current standard includes a relatively narrow definition for what should be identified as a geologically hazardous area ("Naturally occurring slopes of 40 percent or more"); state guidance and neighboring jurisdictions provides a broader range of potential geologic hazards.	Delete current subsection A and replace with: *Geologically hazardous areas are those areas that are naturally susceptible to geologic events such as landslides, seismic activity and severe erosion. Areas susceptible to one or more of the following types of hazards shall be designated as geologically hazardous areas:* 1. *Landslide Hazard Areas; Areas with slopes steeper than 40 percent. Areas with slopes between 15 to 40 percent that are underlain by soils largely consisting of silt and clay. Areas with slopes steeper than 15 percent with zones of emergent water such as groundwater seepage or springs. Areas of landslide deposits regardless of slope.* 2. *Erosion Hazard Areas: Erosion hazards areas are lands underlain by soils identified by the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) as having "severe" or "very severe" erosion hazards.* 3. *Seismic Hazard Areas: Seismic hazard areas are lands that are underlain by soft or loose saturated soils that are subject to liquefaction settlement or spreading during earthquake induced ground shaking.*	Brings code in line with many other local jurisdictions, including Mountlake Terrace, Mill Creek and Edmonds.	
17.10.090B	Inconsistent with BAS and Guidance	Implies the City is the source for technical information regarding these hazards.	Problem areas known to the City can be designated specifically. (See above). Update to indicate that these areas are identified on the existing *Environmentally Sensitive Areas Map.*	Provides a resource for preliminary site assessments.	Change made
17.10.091 Setbacks	Inconsistent with BAS and Guidance	Setbacks are appropriate for steep slopes or landslide hazards, but may not be for all erosion or seismic hazards, which may occupy entire sites but may be mitigated by	In addition to setbacks for steep slope and potential landslide areas the code should require delineation of areas of non-disturbance and/or stabilization for potential erosion hazards and require geotechnical	Erosion hazards typically occur as a result of ground disturbance by human activity. They can be minimized during and stabilized once construction is	Change made

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		employing engineered solutions.	design modifications and mitigation to avoid potential risk from seismic hazards. However, in the case of naturally occurring erosion hazards, such as those created by channel migration in streams, setbacks would be appropriate.	complete.	
17.10.092 Alteration allowed	Generally consistent with BAS and Guidance		Add the word "potentially" before geologically hazardous in the first sentence.	Not all areas that should require a geologic hazard assessment are in fact a geologic hazard area.	Change made
17.10.093 Alteration conditions	Guidance and Code consistency.	In Section B "adequately mitigated" is somewhat vague, subjective and hard to "demonstrate".	In section B add "rendering the site containing a geologic hazard as safe as one not containing one" after mitigation."	Otherwise conditions may need to be imposed limiting proposed use, density, and layout. This would be "demonstrated" by the geotechnical engineer to the City.	All changes made
		Not consistent with report section	In Section C add: *3. "All development proposals on sites containing erosion hazard areas shall include temporary erosion and sediment control plans consistent with adopted surface water design manual and a vegetation management and restoration plan to ensure permanent stabilization of the site."*	Required for consistency with report requirements per 17.10.094	
17.10.094 Geotechnical report content requirements	State licensing requirements and code consistency	Language is too general and should specify that reports be completed by experts with local experience and licensure.	Suggested changes: "Geotechnical Reports shall be prepared and stamped by a geotechnical engineer or engineering geologist licensed by the State of Washington" "Geotechnical reports on Geologically hazardous area shall be subject to independent review"	State licensing required by State law. Licensing from the Washington State DOL ensures that engineers and geologists have the appropriate education and experience.	All changes made
		Requirements for site map do not include all necessary information.	Modify Subsection B so that site map must include location of any subsurface explorations such as test pits or borings.	Typically explorations are used for soil condition interpretation and stability analyses. The locations of any explorations should be accurately depicted on the site map.	
		Additional report content requirement necessary to document sites with potential landslide and/or seismic hazards.	Add new subsections requiring: 1) slope stability analyses in areas with potential risk of landsiliding; and 2) site seismic response evaluation in areas with		

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			the potential risk of soil liquefaction		
Frequently Flooded Areas					
N/A – Frequently flooded areas provisions are not currently included in LMC Chapter 17.10; Flood Hazard Area Regulations are provided in LMC Chapter 16.46	Could be revised to be more consistent with BAS and GMA	Regulations within LMC 16.46 meet minimum NFIP and State standards for floodplain management. No reference to Flood Hazard Area Regulations is provided within LMC Chapter 17.10.	Add new section to LMC Chapter 17.10 – "Frequently flooded areas", and require compliance with all standards for LMC Chapter 17.10 in this section.	Revise for clarity to both applicants and City staff, and consistency with GMA Ecology 2015	Change made to add new "Frequently flooded areas" section, including reference to standards within LMC 16.46
		LMC 16.46 does not require compensatory floodplain storage for riverine floodplains (except within floodways). In Lynnwood and City Urban Growth Areas, these floodplains are associated with Scriber Creek and Swamp Creek.	Consider requiring compensatory storage for all permitted floodplain fill within the Scriber and Swamp Creek floodplains.	NMFS 2009; PSP 2009; FEMA 2013; Ecology 2015	No change. City may consider for updates to LMC Chapter 17.10, but no changes for the new "Frequently Flooded Areas" section
		LMC 16.46 requires that new residential and nonresidential construction be elevated such that the lowest floor is elevated to or above the design flood elevation. This provides protection only consistent with FIRM mapping (to the 1 percent chance annual flood), so does not provide any additional protection to further minimize risk or anticipate increasing flood risks (either from increased runoff or climate change).	Require at minimum 1-foot of freeboard above the base flood elevation.	PSP 2009; FEMA 2013	No change. City may consider for LMC Chapter 17.10, but no changes for the new "Frequently Flooded Areas" section
		Recent BAS has highlighted the importance of floodplains for providing habitat to numerous fish and wildlife species, including anadromous salmon. FEMA Region X now requires all floodplain development within the Puget Sound to assess and avoid potential impacts to Endangered Species Act –listed salmon and their habitat.	Consider designating frequently flooded areas as a "fish and wildlife priority habitat" under 17.10.080 and requiring habitat assessments for development activities within frequently flooded areas. Specific criteria for floodplain habitat assessments could be required in code.	PSP 2009; FEMA 2013 Opportunity to strengthen consistency with FEMA Region X's Floodplain Habitat Assessment and Mitigation Guidance.	Change made to add frequently flooded areas as a fish and wildlife priority habitat under 17.10.080 (fish and wildlife priority habitat)
Critical Aquifer Recharge Areas					
N/A – No existing provisions	Inconsistent with GMA	Critical aquifer recharge areas (CARAs) are not designated or protected in the current CAO. According to Snohomish County CARA mapping, a portion of a CARA is located within the City.	Add section(s) that designate and protect CARAs, pursuant to the GMA and its implementing regulations. Please see detailed recommendations for CARA provisions in endnote following this table.[iv]	Ecology 2005; Ecology guidance for protection of wellheads.	Change made – added as an entirely new section consistent with State's model code.

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General Provisions (Sections 17.10.100 through 17.10.131)					
17.10.100 Buffer credit	Consistent with BAS			This section provides an incentive to property owners to maintain critical area buffers.	Per City direction, this section removed – provision has not been used and generally causes confusion (not compatible with zoning/land use standards).
17.10.110 Low-impact use of buffer—Allowed	Inconsistent with BAS	Section states that low-impact uses may be allowed within critical area buffers, subject to approval by the director.	Specify that low impact uses are only potentially allowed within stream and wetland buffers; for example, pedestrian trails are generally not appropriate within geologically hazardous area buffers. In addition, consider including a list of specific low-impact uses that would be allowed within buffers (see the list of 'allowed buffer uses') in Bunten et al., 2012 and CTED, 2007	Clarity to both applicants and City staff. *Wetlands and CAO Updates: Guidance for Small Cities* (Bunten et al., 2012) recommendation and CTED, 2007	Changes made – section revised consistent with BAS and moved to LMC 17.10.045
17.10.111 Critical areas signs, monuments and fencing	Consistent with BAS			CTED, 2007	
17.10.120 Appeals	Consistent with BAS			CTED, 2007	
17.10.125 Notice, performance securities, bonds, administration	Consistent with BAS			CTED, 2007	
17.10.130 Unauthorized alterations	Could be revised to be more consistent	Section states that if critical areas and/or their buffers have been illegally altered, then the city may require them to be restored.	If an unauthorized alteration occurs, restoration should be required (i.e. change 'may' to 'shall'). Additionally, for clarity, consider combining this section with Section 17.10.131.	CTED, 2007	City elected to not make these changes, maintaining limited flexibility for cases of unauthorized alteration
17.10.131 Enforcement, violations and penalties	Could be revised to be more consistent	Similar to above, there are several uses of the word "may," such as "the city may require restoration."	For clarity to both violators and City staff, consider substituting the word "shall" for "may" throughout this section.	CTED, 2007	City elected to not make these changes, maintaining limited flexibility for cases of violation / application of penalties
17.10.140 Severability	Consistent with BAS			CTED, 2007	

Footnotes

[i] Definition from Ecology guidance (Bunten et al., 2012): *"wetland" or "wetlands" means areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from non-wetland areas created to mitigate conversion of wetlands.*

[ii] Ecology's buffer recommendations (Table XX.1; Bunten et al., 2012) are based on a moderate-risk approach to protecting wetland functions. Buffer width recommendations in Table XX.1 are based on the assumption that the buffer is well-vegetated with native species and that the mitigation measures in Table XX.2 will be implemented (without implementation of these assumed measures, a 33% increase in the standard buffer widths of Table XX.1 is indicated). A recent synthesis regarding buffer functions and required widths, titled *Update on Wetland Buffers: State of the Science* (Hruby, 2013), recommends an approach to buffer widths based on buffer functions. Adequate performance of key buffer functions typically

require the average buffer width ranges (depending on the site and landscape setting): 100 feet to 1,000 feet for wildlife, 30 to 100 feet for sediment removal, 100-180 feet for nitrogen removal, and 30 to 100 feet for phosphorus removal (Environmental Law Institute, 2008 in Hruby, 2013). Recent research indicates that fixed-width buffers may not adequately address issues of habitat fragmentation and population dynamics; rather, buffer widths and fragmentation are only two of many variables that affect wildlife population dynamics (Hruby, 2013). Surrounding land use, plant community structure, intensity of human disturbance are additional factors that affect wetland-dependent species (Hruby, 2013). Water quality and quantity factors may also be influenced by adjacent pollution sources and stormwater inputs. Measures included in Table XX.2 are intended to further minimize the impact of these factors.

[iii] **Stream classification system conversion table:**

Current, *with Definition*	**Proposed**	**Notes**
Not currently included in CAO (although small segment of Puget Sound shoreline is regulated by the City's SMP)	Type S	• Represents waters which are "Shorelines of the State"
Category I *Includes Scriber Creek, Swamp Creek, Lunds Creek and Halls Creek.*	Type F	• Type F represents all waters (perennial or seasonal) that are known to be used by fish OR contain fish habitat as defined by DNR criteria • Current definition in CAO includes only specific streams; typing system should be revised to include all streams that meet Type F definition (although special protection could still be provided specific streams)
Category II *Steams other than Category I streams and that flow year-round during years of normal rainfall or those streams that are used by salmonids.*	Type F or Type Np	• Type Np represents perennial waters that do not contain fish or fish habitat • Current definition in CAO includes only non-salmonid-bearing • Current Category II streams likely should be split between proposed Type F and Type Np categories, depending on whether or not fish use OR fish habitat is present.
Category III *Streams that are naturally intermittent or ephemeral during years of normal rainfall and are not used by salmonids.*	Type Ns or Type F	• Type Ns represents intermittent waters that do not contain fish or fish habitat and have intermittent flows • Does not include stream reaches located downstream from any Type Np water (i.e., you can't have no fish reaches below fish reaches) • Some Category III streams may contain fish (non-salmonids) and would therefore be Type F