VII. NATURAL HAZARDS

BACKGROUND

The hazards policy group of the land use plan concerns the following: seismic shaking, liquefaction, tsunamis, landslides, flooding, and bluff and beach erosion. A brief definition of each type of hazard is given along with a summary of the hazards existing in Capitola's coastal zone. For a more detailed discussion of each type of hazard and the remainder of the background information below, see Capitola LCP Working Paper #2 (May 1980; available at Commission or City offices).

SEISMIC SHAKING

Seismic shaking is caused by movement of the earth's crust in fault zones. Active faults are located offshore from Capitola in Monterey Bay and in the Santa Cruz mountains. While no active faults underlie the City, a high magnitude earthquake along any of the nearby faults would result in intense shaking.

LIQUEFACTION

Liquefaction occurs in areas underlain by unconsolidated water-saturated sediments. During seismic shaking, these areas acquire liquid-like properties which can result in ground failure and buildings sinking, tilting, or toppling. The hazard areas in the coastal zone are the Village, the Soquel Creek mouth and banks, and noble Gulch. A map is attached which shows the areas subject to liquefaction.

TSUNAMIS

Tsunamis or seismic sea waves are large oceanic waves, resulting from submarine volcanic eruptions, seismic events, or landslides. The maximum probable tsunami to hit Capitola's shoreline is estimated to be 20 feet in height. Portions of the Village and mouth of Soquel Creek could be inundated as indicated on the attached map.

LANDSLIDES

Landslides occur as a result of ground failure in inherently unstable materials, as well as during seismic shaking on steep slopes. Several human-induced factors contribute to slope instability. These activities include removal of vegetation, alteration of slopes by grading and construction, top loading of slopes with structures, and alteration of slope drainage patterns by channeling runoff from impervious surfaces or otherwise blocking natural drainage paths.

There exist in the coastal zone several areas with slopes of 30 percent or greater. These areas are located along Soquel Creek, Noble Gulch, and Escalona Gulch. The Escalona Gulch landsliding potential is compounded by the fact that the area is covered by highly erodible soils.

FLOODING

The lowlands along Soquel Creek, most of the Village, and the lowlands immediately adjacent to Noble Gulch lie within the 100 year floodplain (i.e. all this area is expected to flood at least once every 100 years).Soquel Creek has flooded several times in the past and will probably flood again. Development within the floodplain increases the severity of floods by obstructing waterflow and supplying debris which can accumulate, causing flood waters to back up and rise.

BLUFF AND BEACH EROSION

The beaches and bluffs of most of the California coastline are eroding. ~~In~~ Bluffs in the City of Capitola, ~~the bluffs~~ extend both up and downcoast of the Village, and these areas are eroding at ~~a moderate to~~ fairly high rate (~~from~~ up to 1.5 to 3 feet per year). Both private and public development is presently threatened by such bluff retreat. The most important public ~~property~~ properties immediately endangered ~~is~~ are along Grand Avenue at Depot Hill and Cliff Drive. Several residential structures are also threatened along those bluffs. ~~Presently the only seawall or protective device to reduce the rate of erosion is the rip-rap placed at the base of the bluff just upcoast of Hooper Beach.~~ Other than armoring nearest the Village, the bluffs along Depot Hill are almost entirely unarmored (as of 2025). The armoring at Cliff Drive is significant, but it is being undercut by ongoing and episodic erosion. Without intervention, the bluff will continue to recede, threatening the Cliff Drive corridor. In terms of beach/shoreline erosion, Capitola Beach ~~has~~ experienced periodic episodes of erosion and lost sand after the Santa Cruz Small Craft Harbor was completed, ~~apparently~~ including because the harbor and its jetties ~~have~~ interfered with downcoast transport of beach sand. ~~The City had a groin installed in 1970 and~~ In 1970, the Army Corps of Engineers constructed a groin at the downcoast end of the Esplanade, which was accompanied by imported sand to fully recharge the beach. The groin has helped maintain and restore beach width at Capitola Beach, and was refurbished in 2020 to help extend its life and preserve its efficacy. A concrete seawall ~~at the inland boundary of the~~ separates the beach from ~~protects~~ the parking lot and Village businesses ~~from wave attack unless the waves are large enough to~~, although large waves/wave events periodically top the wall, resulting in flooding and storm damage in the Village~~, an event which has occurred in recent past winters~~.

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RELEVANT COASTAL ACT POLICIES

The following Coastal Act policies pertain to natural hazards in Capitola's coastal zone:

SEC. 30253 (1) AND (2)

New development shall:

1) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.

2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.

SEC. 30211

Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.
SEC. 30212

a) Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where (1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources, (2) adequate access exists nearby, or (3) agriculture would be adversely affected. Dedicated accessway shall not be required to be opened to public use until a public agency or private association agrees to accept responsibility for maintenance and liability of the accessway.

b) For purposes of this section, "new development" does not include: Replacement of any structure pursuant to the provisions of subdivision (g) of section 30610.
   a. The demolition and reconstruction of a single-family residence; provided that the reconstructed residence shall not exceed either the floor area, height, or bulk of the former structure by more than 10 percent, and that the reconstructed residence shall be sited in the same location on the affected property as the former structure.
   b. Improvements to any structure which do not change the intensity of its use, which do not increase either to floor area, height, or bulk of the structure by more than 10 percent, which do not block or impede public access, and which do not result in a seaward encroachment by the structure.
   c. Any repair or maintenance activity for which the commission has determined, pursuant to Section 30610, that a coastal development permit will be required unless the regional commission or the commission determines that such activity will have an adverse effect on lateral public access along the beach.

c) As used in this subdivision, "bulk" means total interior cubic volume as measured from the exterior surface of the structure.

   Nothing in this division shall restrict public access, nor shall it excuse the performance of duties and responsibilities of public agencies which are

required by Sections 66478.1 to 66478.14, inclusive, of the Government Code and by Section 4 of Article X of the California Constitution. (Amended by Cal. Stats. 1979, Ch. 919.)

SEC. 30230

Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

SEC. 30231

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

SEC. 30233 (a)

a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

    1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.

    2) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.

    3) In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetland, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and maintained as a biologically productive wetland; provided, however, that in no event shall the size of the wetland area used for such boating facility, including

berthing space, turning basins, necessary support service facilities, be greater than 25 percent of the total wetland area to be restored.

4) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities.

5) Incidental public service purposes, including, but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake or outfall lines.

6) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.

7) Restoration purposes.

8) Nature study, aquaculture, or similar resource-development activities.

SEC. 30235

Revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shoreline processes shall be permitted when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply. Existing marine structures causing water stagnation contributing to pollution problems and fishkills should be phased out or upgraded where feasible.

SEC. 30244

Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation shall be required.

SEC. 30251

The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.

SEC. 30270

The commission shall take into account the effects of sea level rise in coastal resources planning and management policies and activities in order to identify, assess, and, to the extent feasible, avoid and mitigate the adverse effects of sea level rise.

~~EXISTING~~ POLICIES AND REGULATIONS

SEISMIC SHAKING & LIQUEFACTION

The City of Capitola has adopted and enforced the Uniform Building Code which stipulates standard construction methods for areas subject to earthquakes. The Seismic Safety Element of the General Plan has a policy which requires that in areas identified in the General Plan EIR as having high to very high seismic shaking hazard, a geologic study shall be done which delineates adequate structural mitigation measures prior to approval of development plans.

TSUNAMIS

The General Plan states that any development, redevelopment, or major rehabilitation along the beachfront and mouth of Soquel Creek that may be subject to runup shall require a report demonstrating measures of mitigation for potential flooding. The General Plan also requires an adequate setback from bluff edges to reduce the hazard of wave runup. This setback is to be determined in a geologic report which the City is to require for all bluff top developments.

LANDSLIDES

Although the City's General Plan does not have a specific section on landslides, unstable slopes are treated by the Open Space Element. The Open Space Element prohibits development along riparian areas which are susceptible to landslides.

FLOODING

The General Plan states that no new development should take place within the 100-year flood plain of Soquel Creek unless federal flood plain standards are met. The zoning ordinance includes a flood plain zoning overlay and flood plain regulations which are applied to the 100-year flood plain as designated by FEMA. The flood plain ordinance does not allow new construction or substantial improvement in the designated flood way and requires that such development in the flood plain be elevated above the flood height for residential construction or flood-proofed for commercial development.

BLUFF AND BEACH EROSION

In response to ongoing bluff and beach erosion, multiple armoring structures exist along the Capitola shoreline. However, such armoring structures, while protecting development

inland of them, have a series of adverse coastal resource impacts, including ultimately leading to a loss of beach.

The bluffs and beaches are threatened by storms, erosion, and sea level rise; and adaptation, in light of such coastal hazards, will prove critical in coming years. The City will continue to engage in coastal adaptation planning to address known vulnerabilities of bluff and beach erosion and explore mechanisms to better protect resources and enhance and adapt public and recreational access opportunities and amenities.

~~The City's General Plan includes the Coastal Commission's interim guideline (of 1974) on bluff top development as a policy in the Seismic Safety Element. However, the Coastal Commission has revised its bluff top policy to make it more clear and stringent; this indicates a need for the City to possibly update its policy. The Conservation Element has policies on both beach and bluff erosion. It recommends replacement of sand lost from erosion and stabilization measures for Capitola Beach. The Conservation Element also includes a policy that shoreline protection works can be placed after detailed study of the subject area. Is also ranks the types of permissible shoreline works as follows:~~

~~1) Addition of rip-rap at the base of the cliffs;~~

~~2) Provision of additional rock groins to encourage permanent expansion of beaches if feasible;~~

~~3) Provision of seawalls as a last resort where other methods are not satisfactory.~~

STATE AND FEDERAL REGULATIONS

Several agencies have jurisdiction over areas that are involved in the above hazard types. These are:

- California Coastal Commission – Even after the City's LCP has been certified and is being implemented, the Coastal Commission retains ~~permit control~~ jurisdiction over tidelands, submerged lands, and public trust lands (pursuant to Coastal Act Section 30519), and performs an oversight role in relation to the City's delegated jurisdictional responsibilities.

- State Department of Fish and ~~Game~~ Wildlife – Requires a permit for any activity in Soquel Creek and the immediate banks, and reviews any project proposed for ocean waters.

- State Lands Commission – Requires a permit for any project which is a seaward of the Mean High Tide line or which would alter the MHT line, i.e. the State's boundary.

- State Department of Parks and Recreation – If their property is to be utilized for any project, including as access to another site, the Department's permission is necessary.

- U.S. Army Corps of Engineers – Requires a permit for any activity which is seaward of the Mean High Tide line or is in any navigable water or wetland.

- Regional Water Quality Control Board – Activities affecting California's surface, coastal, or ground waters require a permit from the Central Coast Regional Water Quality Control Board.

- Monterey Bay National Marine Sanctuary – Regulated activities below Mean High Tide Line require a National Marine Sanctuary permit.

Natural Hazards Component Policies

GENERAL POLICIES

Policy VII-1 It shall be the policy of the City of Capitola to adequately plan for natural hazards in new development, reduce risks to life and property, and revise all plans and Zoning Ordinances to be in conformance with all the policies of the Coastal Act relating to hazards and shoreline structures. The City shall further take into account the effects of sea level rise in coastal resources planning and management policies and activities in order to identify, assess, and, to the extent feasible, avoid and mitigate the adverse effects of sea level rise.

Implementation:

a) Requires geologic/engineering reports in areas of high seismic shaking for structures subject to public use or multi-residential as required by the UBC.

b) Revise Zoning Ordinance to require geologic reports for all development proposed on coastal bluffs or beaches, including shoreline structures such as seawalls and including provisions of Policy VII-8.

Policy VII-2 All geologic/engineering reports required by the City pursuant to the policies of this component shall be prepared by a qualified geologist/engineer according to the guidelines for practice issued by the California ~~Division of Mines and Geology~~ Geological Survey and shall be based on the best available, professionally accepted science and scientific guidance.~~, specifically CDMG notes Numbers 37 (Guidelines to Geologic/Seismic Reports), 43 (Recommended Guidelines for Determining the Maximum Probably Earthquakes), 44 (Recommended~~

~~Guidelines for Preparing Engineering Geologic Reports) and interpretive Coastal Commission for Bluff Top Development.~~

Bluff and hillside stability evaluations shall consider a range of coastal hazards—including erosion rates, wave climate, storm surge, and sea-level rise—over a 50-year planning horizon. Proposed development shall incorporate mitigation measures designed to perform for a minimum of 50 years post-occupancy. Site-specific analysis must be prepared and sealed by a California-licensed Geotechnical Engineer (GE) or Certified Engineering Geologist (CEG) and accepted by the City of Capitola.

Implementation:

Incorporate policy requirements for all development proposals subject to Policy VII-2.

SPECIFIC POLICIES

Seismic Safety Policies

Policy VII-3 The City shall require all new building plans, for public use structures or multi-residential (more than three units), to conform with the Uniform Building Code construction standards.

Implementation:

Requires geologic/engineering reports in areas or high seismic shaking for structures subject to public use or multi-residential as required by the UBC.

Tsunamis

Policy VII-4 Measures to mitigate possible flooding shall be submitted for all new structures that will be occupied by the public located in areas as shown on Map VII-3.

Implementation:

Develop regulations limiting development in coastal flood hazard areas as designated by FEMA.

Landslides

Policy VII-5 A geologic/engineering report which indicated methods of achieving structural stability and mitigation measures to prevent erosion shall be submitted for any structure which is to be constructed on a slope in excess of 30 percent.

Implementation:

Revise Zoning Ordinance to require geologic/engineering report for structures to be built on slopes in excess of 30 percent.

Flooding

Policy VII-6 It shall be the policy of the City to adopt a local flood plain ordinance consistent with the Federal Emergency Management Agency (FEMA) requirements for designated 100-year riverine flood plains

Implementation:

Adopt riverine flood plain ordinance.

Beach and Bluff Erosion

Objective: Protect and enhance bluff, shoreline, offshore, and sandy beach recreational areas for public use and enjoyment while ensuring all development (including private structures and public infrastructure) is protected, as much as possible, from both current and future coastal hazards. Ensure that otherwise allowable development is sited, designed, and conditioned to minimize risks to life and property, to avoid being subject to coastal hazards, and where development cannot entirely avoid coastal hazards, to appropriately mitigate for adverse impacts to coastal resources, including to bluff, shoreline, offshore, and sandy beach recreational areas.

Policy VII-7 Bluff and cliff top development shall be approved only if design and setback provisions are adequate to assure stability and structural integrity for ~~the expected economic lifespan of the development (~~at least 50 years~~)~~ and if the development (including storm runoff, foot traffic, grading, and irrigation) will neither create nor contribute significantly to erosion problems or geologic instability of the site or surrounding area. This policy shall be carried out by requiring geologic reports as per Policy VII-8.

~~Implementation:~~

~~Revise Zoning Ordinance to require geologic reports for all development proposed on coastal bluffs or beaches, including shoreline structures such as seawalls and with specific emphasis on provisions outlined in Policy VII-7.~~

Policy VII-8 A geologic/engineering report shall be submitted for any bluff top or cliff development proposed within 200 feet of the cliff edge.

The City may designate a lesser area of demonstration in specific areas of known geologic stability (as determined by adequate geologic evaluation and historic evidence) ~~or where adequate protective works already exist~~. The City may designate a greater area of demonstration or exclude development entirely in areas of known high instability.

The technical ~~geology~~ report shall be prepared by a ~~registered geologist or professional civil engineer~~ qualified professional with expertise in shoreline processes ~~soils or foundation engineering or by a certified engineering geologist~~. The report shall consider and analyze any information required by Policy VII-2.

Implementation:

~~a) Revise Zoning ordinance to require geologic reports for all development proposed on coastal bluffs or beaches, including shoreline structures, such as seawalls and including provisions of Policy VII-8.~~

a) Develop maps for public information showing areas and parcels requiring the submittal of geologic reports.

Policy VII-9 Shoreline structures, ~~such as~~ including but not limited to seawalls, revetments, groins, and breakwaters, shall be permitted only to serve coastal dependent uses, to protect existing ~~development~~ structures (other than accessory structures), or to protect public beaches in danger of erosion; shall only be permitted ~~only~~ if nonstructural solutions (such as ~~artificial~~ beach nourishment and relocating structures) and any other less environmentally damaging alternatives (such as nature-based adaptation measures) have proved to be infeasible; shall only be permitted if determined to be the least environmentally damaging feasible alternative to protect the endangered structure/beach/use; and, shall only be permitted if all coastal resource impacts are avoided as much as possible, and where all unavoidable impacts are commensurately mitigated. Such structures shall be designed to eliminate or mitigate adverse impacts on local shoreline sand supply, public access, visual resources, marine habitats, ~~and~~ paleontological resources, and other coastal resources. It is further the policy of the City of Capitola that no permanent channelization of the mouth of Soquel Creek shall be permitted. The seasonal movement of sand to form the lagoon, maintenance dredging and infill of bulkheads shall not be considered permanent channelization.

Implementation:

Incorporate policy direction in Planning Commission and Architectural and Site Review for projects involving shoreline structures.

Policy VII-10 The City should continue to participate with the State Department of Boating and waterways in studying the bluff erosion problem and possible solutions. The City should participate in any proposed shoreline project only if the project is in conformance with other LCP policies.

Implementation:

a) Present results of bluff erosion study by the Department of Boating and Waterways to the public for review. Pursue funding for proposed measures, if any, if they appear feasible.

b) Develop an ordinance to require notification of potential erosion hazards to any new owner, upon sale of properties along Coastal bluffs within Capitola.

Policy VII-11 The City shall construct future drainage projects and improve existing drainage facilities where feasible so that runoff is ~~filtered and treated, and~~ directed away from the coastal bluffs~~, or if it cannot be~~ (except that where such measures are infeasible it shall be discharged in a place and manner so as not to contribute to erosion of a bluff or beach.)

~~As a condition of approval f~~ For any coastal adaptation strategies along Cliff Drive, ~~require the removal of any non-native and invasive plans and replacement with native bluff plants and~~ explore the feasibility of directing drainage to inland drainage systems. Ensure that drainage in coastal hazard areas does not contribute to coastal bluff or other shoreline and erosion, and camouflage all drainage elements to minimize impact to visual resources.

Implementation:

Cooperate with AMBAG in the development of erosion control regulations for all new development as required by the regional Water Quality Control Board with specific emphasis on reducing erosion impacts on coastal bluffs and beaches.

Policy VII-12 Notwithstanding other LCP provisions, resiliency and adaptation projects may be approved along Cliff Drive provided they use the best available science to address and mitigate impacts from sea level rise and climate change related phenomena, enhance public recreational access, and protect/enhance ESHA/paleontological resources.

Capitola Village

Policy VII-13 Capitola Village is critically important for the City, not only for its residents, but also its visitor-focused economy and its significant public recreational access offerings. Due to its low-lying nature, the Village and its fronting beach are threatened by storms, erosion, and sea level rise. Adaptation in light of such coastal hazards will prove critical in coming years. The City is pursuing funding to embark on coastal adaptation planning to address known vulnerabilities of the Village and Capitola Beach and explore mechanisms to better protect Village resources and enhance and adapt public and recreational access opportunities and amenities.

MAP NOTES

The LCP Land Use Plan Map has been prepared by using the same format as the City of Capitola General Plan Map, in order to make it easier to use. The land use designations in the General Plan are carried over into the Land Use Plan where they are consistent with the Coastal Act of 1976. The maps included in the text should be considered as part of the Land Use Plan Map and provide further interpretation of the Land Use Plan policies. The full-size versions of these reduced maps will be available for review in the City offices.

Also, as in a General Plan Map, this Land Use Plan Map is not meant to be a parcel-by-parcel description of appropriate land uses. Rather, the Map should be uses in conjunction with the Policies to guide development of individual parcels. Other map notes follow.

1) The Map shows land use designations only for those areas that are both in the Coastal Zone and the City limits.

2) The Coastal Zone boundary line is approximate. Official boundary maps are available in the Coastal Commission and the City of Capitola offices.

3) As under the current Capitola General Plan, in some cases, the designated land use is not representative of the existing land use. The designated use should direct future permits and planning.

4) The location of coastal bluffs that are shown are only approximate. Policies of the Natural Hazards Component should guide land use involving bluffs.

5) In areas designated residential, public facilities (e.g. fire station, parks, schools) are permitted uses.

6) The V-5 symbol on the map denotes that a site is designated for a visitor-serving use. Visitor-serving uses are defined in the Recreation and Visitor-Serving Component.

7) The Mixed Commercial-Residential land use indicates that combined commercial and residential uses are appropriate on a single site. This land use designation is defined in the Housing Component.

8) The map has 6 high-density residential uses designated. Two of these sites have been identified in the Housing Component Policies as suitable for low and moderate income housing projects.

9) The Village Center area is outlined. Design and Development Guidelines for the Village are included in the Visual Resources and Special Communities Component. Land areas in the Village are designated for Residential or Mixed Commercial-Residential, Visitor-Serving and Public Facilities compatible with land use patterns.