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IA 2 – Geologic Emergencies

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IA 2 Tasked Agencies	
Primary Agencies	Transportation and Development Fire Defense Board Human Services Sheriff's Office
Supporting Agencies	Emergency Management Public and Government Relations

1 Purpose and Scope

This appendix addresses hazards and impacts related to earthquake, landslide, volcano eruption, and subsidence.

2 Policies and Authorities

- None at this time.

3 Situation and Assumptions

3.1 Earthquake

The Cascadia Subduction Zone lies just off the Oregon coast. This zone, where the Pacific plate is being submerged beneath the North American plate, is part of a larger subduction system that includes the seismically active, and extremely hazardous, San Andreas Fault and Alaskan earthquake zones. Clackamas County is well within the impact area for a major subduction earthquake occurring along the Cascadia Subduction Zone.

Earthquake hazard is created by tectonic movement within the earth's crust. This movement generates regional and localized ground shaking and/or soil liquefaction. After an initial seismic event, tremors or aftershocks can occur for an extended period of time, resulting in continuing structural damage. There are several known fault lines throughout the County, with further geologic analyses ongoing. An earthquake measuring 5.6 occurred in March 1993 and caused damage throughout the County, especially in the Molalla area.

Recent studies indicate that the Pacific Northwest could be subject to subduction earthquakes ranging from magnitude 8.5 up to magnitude 9.1. Additional fault zones throughout the County and region may produce localized crustal earthquakes of up to 6.0. A local earthquake of M 6.0 or a regional M 9 earthquake is likely to cause substantial structural damage to bridges, buildings, utilities, and communications systems, as well as the following impacts to infrastructure and the environment:

- Floods and landslides.
- Fires, explosions, and hazardous materials incidents.

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- Disruption of vital services such as water, sewer, power, gas, and transportation routes.
- Disruption of emergency response systems and services.

Actual earthquake damage can vary significantly, depending on the nature and severity of the event, localized soils, and structural vulnerability. Most injuries result from flying/falling building contents and debris.

Seismic vulnerability assessments have highlighted the need for seismic retrofit of critical facilities. As a result, the County has recently completed several structural and non-structural seismic upgrades in key facilities and is identifying additional areas for upgrades.

3.2 Landslide/Debris Flow

This hazard may include the down-slope movement of rock, soil, or other debris or the opening of sinkholes. These hazards are often associated with other incidents such as floods, earthquakes, or volcanic eruptions. Landslides occur frequently, often fueled by heavy rainfall combined with the moderate to high relief characteristics of the County's riverbeds.

Through the Natural Hazard Mitigation Plan process, the County has mapped landslide-prone areas and has developed and implemented mitigation measures where feasible.

3.3 Volcano

The last known eruptions of Mount Hood, located on Clackamas County's eastern border, occurred in the middle of the 19th century. Such recent eruptions, as well as the thermal activity that continues to be present, suggest that molten rock is still within or beneath Mount Hood. Risks associated with a volcanic eruption include pyroclastic flows (incendiary avalanches) and lahars (mud flows), river flooding, destruction of property and woodlands, risk to the Bull Run watershed, and volcanic ash fall. Heavy ash fall in Clackamas County can cause health problems for individuals with certain medical conditions, create havoc with transportation, and pose a significant risk to the public.

Clackamas County has joined with regional partners and State and Federal agencies to develop a Mount Hood Coordination Plan that applies many of the lessons learned from the eruption of nearby Mount St. Helens. This plan identifies agency/jurisdiction responsibilities and establishes procedures for timely and accurate dissemination of warnings and public information.

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4 Roles and Responsibilities

4.1 Primary Agencies

4.1.1 Fire Defense Board

- Coordinate fire agency response.
- Serve in Unified Command.
- Provide staff for Emergency Operations Center (EOC) operations.
- Provide life safety/rescue operations.
- Assist in warning and evacuation operations.
- Conduct welfare checks for employees.
- Report damage, road and weather conditions to the EOC.

4.1.2 Sheriff's Office

- Coordinate law enforcement response.
- Serve in Unified Command.
- Provide staff to support EOC operations.
- Conduct search and rescue operations.
- Coordinate warning and evacuation.
- Provide security.
- Report damage, and road and weather conditions, to the EOC,

4.1.3 Transportation and Development

- Coordinate public works response.
- Serve in Unified Command.
- Provide staff for EOC operations.
- Coordinate road and bridge inspection and assessment.
- Assist in traffic and crowd control by providing signs, barriers, equipment, and personnel.
- Provide heavy equipment.
- Report damage, and road and weather conditions, to the EOC.

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- Assess roads likely to be affected, develop alternate traffic routes, and determine barricade and signage needs.
- Assess emergency transportation routes (ETRs) and determine priorities for maintenance and debris removal.
- Coordinate debris removal from storm drains, roadways, public rights-of-way, and areas potentially impacting public safety or health
- Coordinate with utility providers to protect/restore services.

4.1.4 Health, Housing and Human Services (H3S)

- Coordinate health and human services response.
- Serve in Unified Command.
- Provide staff for EOC operations.
- Assist those with access and functional needs.
- Identify critical facilities in at-risk areas.
- Coordinate emergency medical services and care for injured individuals.
- Assist in coordinating volunteer recruitment and deployment.
- Evaluate contamination of potable water sources and disruption of sanitary services; evaluate other environmental or public health concerns.
- Provide public health information to Unified Command/Public Information Officer for dissemination to the public
- Work with the American Red Cross in opening and operating shelters for evacuated persons and services for special needs populations

4.2 Support Agencies**4.2.1 Clackamas County Emergency Management**

Clackamas County Emergency Management (CCEM) assists in incident management and multi-agency/jurisdictional coordination.

- Implement the EOP.
- Activate the Situation Assessment Team.
- Activate the EOC.

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- Assist Command.
- Advise the County Administrator and Board of County Commissioners.
- Facilitate the Emergency Declaration process.
- Serve as the EOC Manager.
- Coordinate with city, regional, and State counterparts.
- Request Clackamas Amateur Radio Emergency Services (CARES) activation

4.2.2 Public and Governmental Relations

- Provide staff for the Public Information Officer and Joint Information Centers.
- Develop and coordinate a Joint Information System.
- Work with local, State, regional, and Federal jurisdictions.
- Gather, prepare, and have Incident Command approve all communications sent to media, jurisdictions, and employees.

4.3 Volunteer Agencies**4.3.1 American Red Cross**

The American Red Cross provides and manages shelter and mass care operations for citizens who are victims of disaster and feeding and support services for emergency responders. The American Red Cross will:

- Activate and operate emergency shelters for displaced citizens at the direction of Command.
- Provide feeding, basic health, and behavioral health services and welfare assistance.
- Provide an American Red Cross liaison to the EOC.

4.3.2 Clackamas Amateur Radio Emergency Services

- Request that HAM operators report actual or potential hazards and incident conditions to the EOC.
- Assist with Countywide damage reporting.
- Establish an incident-specific net operations plan

IA 2. Geologic Emergencies**5 Concept of Operations**

The Department of Transportation and Development, Sheriff's Office, Health Housing and Human Services (H3S), and Fire Defense Board share primary responsibility for geologic incidents.

Smaller, more isolated geologic incidents are normally managed using internal and mutual aid resources, with various County agencies providing support as needed. For example, during periods of volcanic ash fallout, the Department of Human Services develops and disseminates critical health-related information through the Community Health Division. Law enforcement agencies have primary responsibility for evacuation triggered by geologic incidents. Fire agencies provide special teams to extricate victims from vehicles and to search for and rescue victims in a collapsed structure. The Roads Division is responsible for keeping surface routes clear and/or establishing detour routes. Effective response to a major incident will require the combined efforts and resources of all County agencies.

A major geologic incident is a County emergency requiring notification of CCEM, implementation of the EOP, and activation of the EOC. All geologic incidents are managed according to the National Incident Management System (NIMS) and Incident Command System (ICS).

As time permits, CCEM will convene the Situation Assessment Team to gauge existing and potential risks and to determine appropriate actions that the County should take to minimize hazard impact.

All agencies tasked under this appendix will develop and maintain internal operating plans and implementing checklists consistent with the EOP.

6 Direction and Control**6.1 County**

Depending on the numbers of people affected, the area and extent of the damages, and the response operations required, the incident initially may be managed from a field Incident Command Post or from Department Operations Centers. As the scope of the damage and response increase, and/or more agencies become involved, overall management of the incident will normally transfer to Unified Command in the EOC.

When an IC determines that incident response will require resources beyond those available day-to-day and through mutual aid, requests for assistance should be coordinated through the EOC. If time does not permit pre-coordination, the EOC should be notified as soon as possible. If the needed resources are not available, the County will request State assistance through an Emergency Declaration.

IA 2. Geologic Emergencies**6.2 Cities**

Cities have primary responsibility for the safety and well-being of their citizens and for resource allocation and emergency operations within their jurisdictions. Cities are encouraged to develop EOPs and to work closely with CCEM to integrate preparedness, response, and recovery activities. An intergovernmental mutual aid agreement between the County and cities is available to all jurisdictions that choose to participate. This agreement establishes procedures for requesting and providing mutual aid resources in an emergency.

Cities may request County assistance through mutual aid or through an Emergency Declaration. All city emergency declarations need to be submitted to the County for forwarding to the State, as necessary.

6.3 Special Districts

County officials collaborate with special districts in coordinating emergency preparedness, response and recovery operations. An intergovernmental mutual aid agreement between the County and special districts is available to all jurisdictions that choose to participate. The agreement establishes procedures for requesting and providing mutual aid resources in an emergency.

6.4 Regional

The ETRs receive priority damage assessment, maintenance, and repair to ensure that these major transportation corridors are available to move people to safety and to move personnel and equipment for response operations. (An ETR map is available in the EOC Library.)

Clackamas County is a participant in the Inter-County Omnibus Mutual Aid Agreement that provides a framework for counties to request mutual aid from each other in emergencies, saving time and minimizing confusion during an incident.

6.5 State and Federal Assistance

Geologic hazards are monitored by the United States Geologic Survey (USGS). Seismic hazards or earthquakes are monitored by the Pacific Northwest seismograph network. This network provides data from seismometers across Washington and Oregon and is administered by the University of Washington. Volcanic hazards are monitored by the Cascades Volcanic Observatory. These USGS sponsored agencies will work closely with County agencies in the event of an earthquake or volcanic eruption.

The Oregon Department of Forestry operates and maintains a network of instrumentation to identify potential landslides, and administers a landslide warning system throughout the State. The Oregon Department of Forestry is responsible for notifying the County when landslides warnings are being issued.

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The National Weather Service (NWS) is responsible for alerting public agencies and the general public of potentially dangerous conditions and impending emergencies. The NWS forecasts daily winds from surface to 50,000 feet for Mount St. Helens and provides an ash fallout advisory whenever conditions warrant. The NWS forecast for the Portland area may be found at <http://www.wrh.noaa.gov/pqr/>

If incident response requires resources beyond those available to the County on a day-to-day basis and through mutual aid, Incident Command will request additional resources through an Emergency Declaration. EOC staff will forward the declaration to the Oregon Office of Emergency Management (OEM) for submission to the governor. OEM coordinates State resources and response and will seek a State declaration if necessary.

7 Annex Development and Maintenance

The Director of the Department of Transportation and Development, Fire Defense Board Chief, Sheriff, and Director of the Department of Human Services are responsible for ensuring that this appendix and supporting plans are updated at least annually, after every incident or exercise to which it applies, or as changes occur. CCEM is available to assist as requested.

8 Supporting Plans and Procedures

- Annex D - Evacuation
- Annex H - Damage Assessment

EOC Library

- Mt. Hood Coordination Plan
- Natural Hazard Mitigation Plan

9 Appendices

None at this time.