12.0 OTHER HAZARDS – NATURAL AND HUMAN-CAUSED

The previous six chapters addressed the natural hazards which pose the greatest risks for Multnomah County: earthquakes, wildland/urban interface fires, landslides, floods, severe weather and volcanic events.

This chapter briefly addresses the many other types of natural hazards which could also pose risk to Multnomah County. However, the level of risk posed by these other hazards is much lower than for the five major hazards and in most cases the level of risk is nearly negligible.

This chapter also briefly addresses the major human-caused hazards. Although some of the human-caused hazards are significant, most actions to reduce risks are entirely or predominantly in the bailiwick of emergency response planning or law enforcement. Such activities are deemed almost entirely outside the scope of Multnomah County's hazard mitigation planning.

12.1 Other Natural Hazards

12.1.1 Drought

Drought is a significant concern in many communities in the Western United States and climate change over future decades may exacerbate drought areas in some states.

However, for Multnomah County the risks posed by droughts, even considering the possible effects of future climate change, appear minimal. Available water supplies from the rivers and streams in Multnomah County and from ground water wells are far above the water usage levels in Multnomah County. Thus, the risk posed by drought appears nearly negligible.

12.1.2 Subsidence

The term "subsidence" refers to lowering of ground elevations, which typically occurs from ground water pumping or petroleum extraction. Subsidence can result in substantial damage to buildings, especially foundations, and to buried utility infrastructure. Subsidence damage may be severe, especially at soil type boundaries where there are discontinuities in the rate of subsidence.

In Multnomah County, there are no known areas where significant damage due to subsidence has or is occurring. Thus, subsidence risk in Multnomah County appears negligible**.**

12.1.3 Expansive Soils

The term “expansive soils” refers to soils, typically clay-rich, that undergo significant expansion and contraction cycles from seasonal variations in water content. Such cyclic changes can result in substantial damage to buildings, especially foundations, and to buried utility infrastructure.

In Multnomah County, there are no known areas where significant damage due to expansive soils has or is occurring. Thus, expansive soils risk in Multnomah County appears negligible**.**

12.1.4 Extreme Temperatures

Prolong periods of extreme temperatures – either unusually cold or unusually hot – can pose life safety risks, particularly for elderly and other at risk populations, especially if power outages are concurrent with extreme temperatures. The greatest risk is to lower income residents without air conditioning or those who have lost air conditioning due to power outages.

Extreme temperatures can also result in property damage, especially to cold-sensitive crops. Extreme cold may also result in freezing and rupturing of water pipes, including irrigation systems and pipes within buildings with inadequate insulation.

Multnomah County’s climate is generally mild; below freezing temperatures are not common but do occur. Average low temperatures range from 34^{o} in December to 57^{o} in July and August. The record low temperature in Multnomah County is -3^{o} which occurred on February 28, 1998. Extreme cold with temperatures well below zero have never occurred in Multnomah County. Unusually cold weather in Multnomah County would result in some damage to cold sensitive landscaping, with the possibility of water damages from pipe breakages. However, extreme cold does not pose a significant risk.

There are no obvious mitigation action items to reduce the impacts of extreme cold on the residents of Multnomah County.

Average high temperatures range from 45^{o} in January to 80^{o} in July and August. On average there are only about 12 days per year with daily high temperatures at or above 90^{o}. Temperatures at or above 100^{o} have occurred between May and September, but are not common. The record high temperature for Multnomah County is 107^{o} which was recorded on July 30, 1965 and August 8, 1981. Prolonged periods with extreme high temperature rarely, if ever, occur in Multnomah County.

Extreme heat often results in localized power outages. Demand for electricity may exceed capacity resulting in brownouts or blackouts. The combination of very high demand and high temperatures results in an increased number of equipment failures (especially lines and transformers), which increase the number of service outages.

Multnomah County is subject to occasional periods of high temperatures.. However, public response to extreme heat situations is for emergency responders and public health staff. There are no obvious mitigation action items to reduce the impacts of extreme heat on the residents of Multnomah County.

Overall, the level of risk posed to Multnomah County by extreme temperatures is low.

Mitigation measures considered under previous hazard chapters to ensure back-up power supplies for critical facilities under disaster or other emergency conditions would also be beneficial during extreme heat conditions, which often include localized or widespread power outages.

12.2 Human-Caused Hazards

12.2.1 Overview

There are many human-caused hazards which pose risks for Multnomah County, including:

- Epidemics,
- Weapons of mass destruction,
- Terrorist or other malevolent actions,
- Structure fires,
- Explosions,
- Civil unrest,
- Transportation accidents (road, rail, air or sea/river),
- Hazardous material incidents,
- Sinkholes (from failures of water or wastewater systems), and
- Others.

All of the above types of human-caused events have the potential for damages, economic losses, and/or deaths and injuries. Thus, while all of these hazards do pose some level of risk to Multnomah County, addressing such hazards is well outside the typical scope of FEMA local hazard mitigation planning. Rather, addressing such hazards typically falls into the domains of:

- Emergency response planning,
- Emergency responders (fire, police and medical),
- Law enforcement,
- Other agencies, including:
    - The Federal Aviation Administration,
    - Environmental agencies for hazardous material incidents, and
    - Public health agencies for public health/epidemics.

Furthermore, consideration of human-caused hazards is not required by FEMA's guidance and requirements for local hazard mitigation plans.

Given these considerations, and the limited local resources to focus on hazard mitigation for natural hazards, the consensus decision of the mitigation planning team developing the 2011 Multnomah County Hazard Mitigation plan was to focus entirely on natural hazards.

This decision does not diminish the importance of planning for human-caused hazards, but rather simply recognizes that such planning is best accomplished separately from the 2011 Multnomah County Hazard Mitigation Plan.

12.2.2 Climate Change

There is a very strong consensus within the scientific community that human actions are resulting in global climate change. As average temperatures continue to increase over the rest of the 21st century, global impacts will include droughts and flooding, rising sea levels, increased vectors and invasive species, and many other significant disruptions to our natural cycles.

For Multnomah County, the most significant impacts of climate change will likely be: increased average temperatures and frequency and magnitude of extreme heat events; the amount and timing of precipitation, with increased flooding and impacts on water supplies; and higher intensity and frequency of wildfires.

Multnomah County's response to climate change is organized under the Climate Action Plan. However, it is important to recognize that anticipated changes to our climate will impact future hazard mitigation planning efforts.

12.3 Mitigation Strategies and Action Items

There are no mitigation strategies or action items included in this mitigation plan for the other natural hazards considered above because the level of risk is very low and/or there are no feasible mitigation measures. However, to some extent, mitigation measures for more important hazards, such enhancing back-up power

for critical facilities, will also help reduce losses for some of the other hazards briefly noted in this chapter.

Similarly, there are no mitigation strategies or action items included in this mitigation plan for the human-caused hazards considered above. Planning for and responding to such events are best accomplished separately from the 2011 Multnomah County Hazard Mitigation Plan.