

Planning Commission
Thursday, April 6, 2023
6:30 PM Regular Meeting

HYBRID Meeting

IN PERSON – McMinnville Civic Hall, 200 NE Second Street, or ZOOM Online Meeting

Please note that this is a hybrid meeting that you can join in person at 200 NE Second Street or online via Zoom

ZOOM Meeting: You may join online via the following link:

<https://mcminnvilleoregon.zoom.us/j/89368634307?pwd=M0REY3RVSzFHeFdmK2pZUmJNdkdSZz09>

Meeting ID: 893 6863 4307

Meeting Password: 989853

Or you can call in and listen via zoom: 1 253 215 8782

Meeting ID: 893 6863 4307

Meeting Password: 989853

Public Participation:

Citizen Comments: If you wish to address the Planning Commission on any item not on the agenda, you may respond as the Planning Commission Chair calls for "Citizen Comments."

Public Hearing: To participate in the public hearings, please choose one of the following.

- 1) **Email in advance of the meeting** – Email at any time up to 12 p.m. the day before the meeting to heather.richards@mcminnvilleoregon.gov, that email will be provided to the planning commissioners, lead planning staff and entered into the record at the meeting.
- 2) **By ZOOM at the meeting** - Join the zoom meeting and send a chat directly to Planning Director, Heather Richards, to request to speak indicating which public hearing, and/or use the raise hand feature in zoom to request to speak once called upon by the Planning Commission chairperson. Once your turn is up, we will announce your name and unmute your mic.
- 3) **By telephone at the meeting** – If appearing via telephone only please sign up prior to the meeting by emailing the Planning Director, Heather.Richards@mcminnvilleoregon.gov as the chat function is not available when calling in zoom.

----- MEETING AGENDA ON NEXT PAGE -----

| Commission Members | Agenda Items |
|-----------------------------------|---|
| Sidonie Winfield, Chair | 6:30 PM – REGULAR MEETING |
| Gary Langenwalter Vice - Chair | 1. Call to Order |
| Matthew Deppe | 2. Citizen Comments |
| Sylla McClellan | 3. Public Hearings |
| Meg Murray | A. <u>Legislative Hearing (Dockets G 3-22): Amendment to the McMinnville Comprehensive Plan, Volume I – Background Element, adopting the Natural Hazards Inventory and Management Program Options and Recommendations; amendment to the McMinnville Comprehensive Plan, Volume II – Goals and Policies, adding a new Chapter XI, entitled Natural Features; amendments to the McMinnville Municipal Code, Chapters 17.48, Flood Area Zone, and Chapter 17.49, Natural Hazard Overlay Subdistricts; and the adoption of the Natural Hazard Mitigation Zone (NH-M) and Natural Hazard Protection Zone (NH-P) (Exhibit 1)</u> |
| Brian Randall | Docket: G 3-22 |
| Beth Rankin | Applicant: City of McMinnville |
| Dan Tucholsky | 4. Commissioner Comments |
| Vacant, Ward 1 | 5. Staff Comments |
| | 6. Adjournment |

EXHIBIT 1 – STAFF REPORT

DATE: April 6, 2023
TO: Planning Commission Members
FROM: Heather Richards, Community Development Director
SUBJECT: Public Hearing – Docket G 3-22, Natural Hazards

STRATEGIC PRIORITY & GOAL:



COMMUNITY SAFETY & RESILIENCY

Proactively plan for & responsively maintain a safe & resilient community.



GROWTH & DEVELOPMENT CHARACTER

Guide growth & development strategically, responsively & responsibly to enhance our unique character.

Report in Brief:

This is a legislative public hearing to consider the following action items as a result of the City's Oregon Land Use Goal #7 work relative to Natural Hazards:

- Amendment to the McMinnville Comprehensive Plan, Volume I – Background Elements, adopting the *2021 Natural Hazards Inventory and Management Program Options and Recommendations* and its Appendices (Attachments 1, 2, 3, and 4 to this staff report).
- Amendment to the McMinnville Comprehensive Plan, Volume II – Goals and Policies, adding a new Chapter XI, entitled *Natural Features* (Attachment 5 to this staff report).
- Amendments to the McMinnville Municipal Code, Chapters 17.48, *Flood Area Zone*, and Chapter 17.49, *Natural Hazard Overlay Subdistricts* (Attachment 6 to this staff report).
- Amendment to the McMinnville Zone Map, adding the Natural Hazard Mitigation Zone (NH-M) and the Natural Hazard Protection Zone (NH-P) (Attachment 7 to this staff report).

A website page has been developed for this effort: [Natural Hazards | McMinnville Oregon](#)

What is a Natural Hazards Mitigation Plan? A natural hazards mitigation plan identifies hazards, vulnerabilities, and risks facing a local, state or tribal government, and prioritizes actions to reduce the risk.

Oregon Land Use Goal #7 (attachment 8 to this staff report) requires local governments to evaluate the risk to people and property when new hazard inventory information is available and assess the frequency, severity and location of the hazard; the effects of the hazard on existing and future development; the potential for development in the hazard area to increase the frequency and severity of the hazard; and the types and intensities of land uses to be allowed in the hazard area. In this effort, governments should allow an opportunity for citizen review and comment on the new inventory information and the results of the evaluation, and adopt or amend, as necessary, based on the evaluation of risk, plan policies and implementing measures consistent with the following principles:

- Avoiding development in hazard areas where the risk to people and property cannot be mitigated; and
- Prohibiting the siting of essential facilities, major structures, hazardous facilities and special occupancy structures, as defined in the state building code.

Oregon Land Use Goal #7 further states that state agencies shall coordinate their natural hazard plans and programs with local governments and provide local governments with hazard inventory information.

In 2018, the Oregon Department of Geology and Mineral Industries updated their geohazards data. At the same time, the US Forest Service updated their Pacific Northwest Quantitative Wildfire Risk Assessment Data.

In 2019, Yamhill County with the aid of a grant from the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Program, updated the Yamhill County Multi-Jurisdictional Hazard Mitigation Plan, which was acknowledged by FEMA in December 22, 2020.

As a partner in that process, the City of McMinnville prepared an addendum to that plan that was adopted by the McMinnville City Council on December 8, 2020 by Resolution No. 2020-67. (Attachment #9 to this staff report). The McMinnville addendum identified a number of action items for the City of McMinnville including mapping and inventorying hazard areas and evaluating comprehensive plan policies and development regulations to ensure that the city is protecting people and property from natural hazard areas. (See Multi-Hazard #2, #7, #11, #12, Landslide #2 implementation actions sheets in the addendum document – attachment #9 to this staff report).

At the same time, the State of Oregon updated the Oregon Natural Hazards Mitigation Plan, which was approved by FEMA September 24, 2020.

The hazards normally identified in Oregon are floods, earthquakes, landslides, wildfires, tsunamis and coastal erosion.

The existing comprehensive plan addresses flood hazards only – consistent with Federal Emergency Management Agency (FEMA) regulations related to the National Flood Insurance Program (NFIP). The current comprehensive plan does not have a separate natural hazards

element. The McMinnville Zoning Ordinance has a separate F-P Flood Hazard Zone that applies to land within the 100-year floodplain. However, the City currently lacks development standards for geological and wildfire hazards. The McMinnville Buildable Lands Inventory indicates slopes of 25% or greater and floodplains as unbuildable consistent with applicable state law.

Discussion:

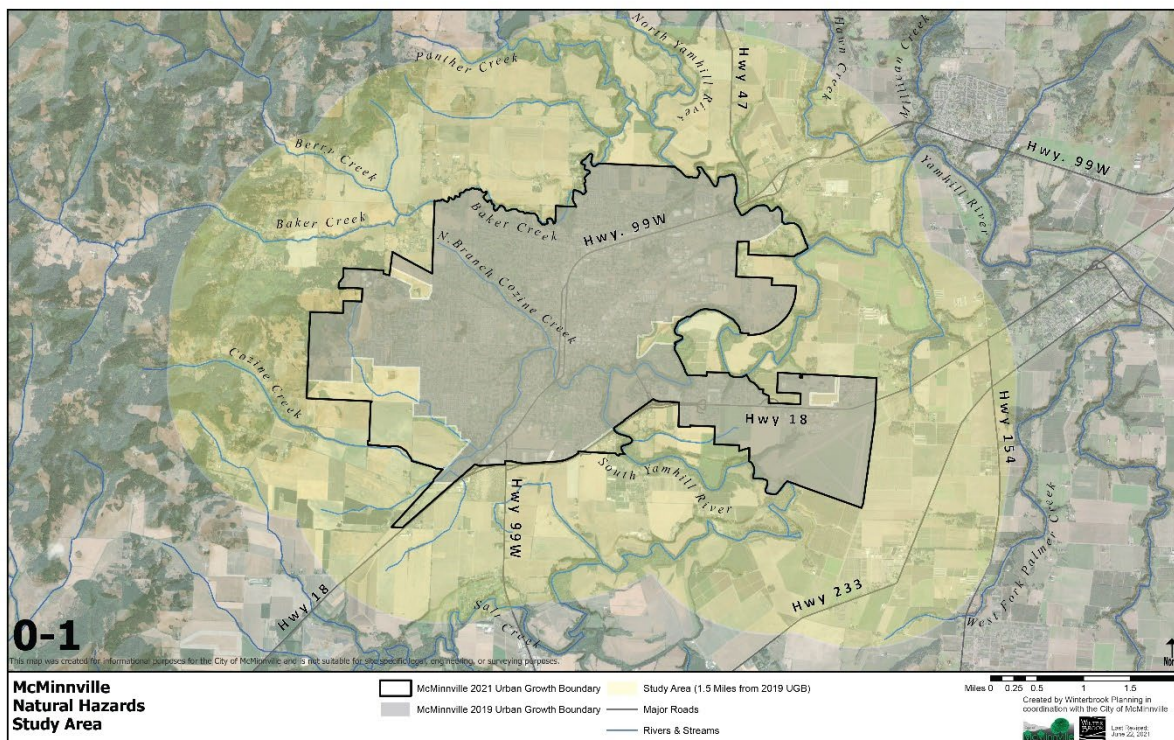
In 2020, the City hired Winterbrook Community Resource Planning to prepare the initial draft of the McMinnville Natural Hazards Inventory, Management Program Options and Recommendations study. The study area at that time included (a) the McMinnville Urban Growth Boundary (UGB) as it existed in June 2020 and (b) the UGB expansion study area within 1.5 miles of the existing UGB.

When the City initiated a UGB amendment process in 2020 simultaneously with the Natural Hazards Inventory and Review, the City considered the natural hazard inventory information provided in the initial draft report as part of the UGB analysis.

In December 2020, the City Council amended its UGB to include approximately 1,280 acres of land (of which 921 acres were considered “buildable”). The County subsequently adopted, and the Land Conservation and Development acknowledged, the UGB amendment in April, 2021.

Figure 0-1 shows the 2021 UGB expansion area in relation to the previously existing 2019 and the Natural Hazards Study Area.

Figure 1 McMinnville 2019 UGB, 2021 UGB, and Natural Hazards Study Area



In April 2021, the City contracted with Winterbrook Planning to revise the 2020 natural hazards study to (a) focus on the expanded 2021 UGB, (b) include social vulnerabilities described in the *Oregon Natural Hazards Mitigation Plan* (Oregon NHMP) in the natural hazards composite ranking system, (c) amend the proposed Natural Hazard Mitigation and Protection maps accordingly, and (d) prepare draft amendments to the McMinnville Zoning Ordinance to include natural hazard mitigation and protection subdistrict maps and text.

The revised study includes an inventory of natural hazards based on available mapping sources, considers alternative management options, and suggests policy and mapping amendments to the McMinnville Comprehensive Plan to systematically address McMinnville's mappable natural hazards within the 2021 UGB.¹

The revised natural hazards inventory includes a series of GIS (geographic information system) overlay maps showing moderate, high and severe hazard areas within the 2021 UGB and study area. The inventory also includes a description of the following natural hazards and how they may adversely affect life and property:

- **Geological Hazards** (areas subject to landslide, steep slope and earthquake liquefaction and shaking impacts)
- **Flood Hazards** (areas within the 100-year floodplain including the floodway)
- **Wildfire Hazards** (areas that are particularly susceptible to wildfires due to topography, fuel and settlement patterns)
- **Composite Hazards** (areas with one or more overlapping natural hazard categories)

This work resulted in proposed amendments to the McMinnville Comprehensive Plan both in terms of new inventory and recommended programs and new policies for natural hazards. It also resulted in proposed amendments to the McMinnville Municipal Code and McMinnville Zone Map, introducing two new overlay districts, the Natural Hazard – Mitigation Zone (NH-M) and the Natural Hazard Protection Zone (NH-P). Regulations for the administration of both overlay zones is proposed as a new chapter 17.49, "Natural Hazards Overlay Subdistricts".

Throughout the past two years of evaluation and draft program implementation, city staff and the Winterbrook team have conducted several work sessions with the McMinnville City Council and Planning Commission informing them of the research and evaluation and seeking policy direction on how to move forward with mitigating the risk. In August 2020, the McMinnville City Council asked city staff and the consultants to develop mitigation measures that would help to assess risk for people and property on land that had multiple hazards, and for those lands with moderate overlapping hazards to require additional assessments as part of the development review and with those lands that were identified as high hazard areas to limit development to low density and intensity development to protect people and property.

¹ Winterbrook addresses relationships among natural hazards and natural resources (such as riparian and upland wildlife habitat and scenic views and viewpoints) in a separate white paper.

Impact to Properties:

Existing Uses are considered conforming within both the Natural Hazard Mitigation Zone and the Natural Hazard Protection Zone, and can be expanded by 50% of the habitable area without implicating the provisions of the natural hazards overlay.

The Natural Hazard – Mitigation Zone allows all permitted and conditional uses in the underlying zones to continue to be developed. However, based on the types of hazards on the property, the Community Development Director will determine if an additional study is needed to help inform the development to protect the people and property from a potential natural disaster. That study might be a geo-site assessment for those properties that have landslide, liquefaction or shaking soil hazards, or a wildfire mitigation plan for those properties within a wildfire risk area. Development on slopes greater than 15% might be required by the City Engineer to provide an erosion control plan as part of their development review.

The Natural Hazard – Protection Zone allows all permitted and conditional uses in the underlying zones but limits the intensity and density of the uses by prohibiting large format commercial development, limiting land division and residential development to one unit per lot unless a planned development process is used to locate the more intensive development on land that is less hazardous. The Natural Hazard – Protection Zone also allows for a transfer of residential density rights to other property within the city limits.

On February 16, 2023, city staff brought the final draft recommendations to the Planning Commission for review and discussion. At that work session, the Planning Commission directed city staff to identify the impact of the hazard planning on property owners from the perspective of insurance provisions, and to develop an appeal process for property owners as well as the ability for property owners in the Natural Hazards – Protection where development is limited to transfer their density rights to other properties within the city.

Insurance Risk:

City staff reached out to insurance agencies to inquire about the rise of this planning effort to home insurance policies. Most homeowners and some renters have insurance to protect their home and belongings. Homeowner and renter insurance typically covers certain natural hazards, such as water damage from heavy rain or snow. As long as it can be demonstrated that a domicile has been maintained in good working order, the majority of costs for repair and replacement can be recovered.

However, homeowner and renter insurance policies almost never cover floods, hurricanes, earthquakes, and other natural hazards. Coverage of these hazards events require separate policies that the homeowner initiates on their own. Due to the earthquake subduction zone in McMinnville, the city is already tagged as a hazard area for home insurance and insurers asked did not feel that this new information would impact anything.

Appeal Process:

City staff researched appeal processes in other communities for property owners to prove that their property should not be included in a hazard overlay. Based on that research, Section 17.49.95 was added to the draft code amendments per the following:

17.49.95 Appeal / Verification of Natural Hazards boundaries. The Natural Hazards boundaries may be appealed and must be verified occasionally to determine the true location of a hazard area and its functional values on a site. This may be through a site-specific survey or a simple site visit in those cases where existing information demonstrates that the Natural Hazard significance rating does not apply to a site-specific area. Applications for development on a site located in a Natural Hazard area may request a determination that the subject site is not subject to the standards of Chapter 17.49. Verifications / appeals shall be processed as either a Type I or Type II process as outlined below.

A. Type I Appeal / Verification.

1. Applicants for a determination under this section shall submit a site plan meeting the requirements of Chapter 17.72, as applicable.
2. An applicant may request a Type I Verification determination by the community development director. Such requests may be approved provided that there is evidence substantiating that all the requirements of this chapter relative to the proposed use are satisfied and demonstrates that the property also satisfies the following criteria, as applicable:
 - a. No natural features have been disturbed.
 - b. No natural features have been changed.
 - c. The property does not contain a natural hazard area as identified by the city's local natural hazards area maps.
 - d. Evidence of prior land use approvals that conform to the natural hazards overlay districts, or which conformed to the natural hazard area overlay district that was in effect prior to the Natural Hazards code adoption date _____.

B. Type II Appeal / Verification. Verifications of the Natural Hazards areas which cannot be determined pursuant to the standards of Chapter 17.49 may be processed under the Type II permit procedure.

1. Applicants for a determination under this section shall submit a site plan meeting the requirements of (site plan requirements) as applicable.
2. Such requests may be approved provided that there is evidence that demonstrates in a report prepared by one or more qualified professionals with experience and credentials in natural resource areas, including wildlife biology, ecology, hydrology and forestry, that a resource function(s) and/or land feature(s) does not exist on a site-specific area.
3. Verification to remove a recently developed area from the Natural Hazards shall show that all of the following have been met:
 - a. All approved development in the Natural Hazards area has been completed
 - b. All mitigation required for the approved development has been successful.
 - c. The previously identified Natural Hazards area on the developed site no longer exist or have been subject to a significant impact.

Transfer of Residential Density Rights:

City staff researched transfer of density rights programs associated with natural hazard overlays in several other Oregon cities. Based on that research, Section 17.49.170 was amended to the draft code amendments per the following:

17.49.170 Residential Density Transfer. A transfer of development density from undeveloped buildable land within the Natural Hazard Protection zone to other property within the city limits is encouraged. Density transfer may occur through the planned development process, as indicated below.

- A. Development Density to Transfer from National Hazard Protection Zone (NH-P). The land area from which density can be transferred excludes developed and unbuildable areas, such as riparian corridors, slopes 15% or greater and easements. 50% of the development density of identified qualifying land within land may be transferred to any other residential zone.
- B. Development Density in Receiving Area. Up to a maximum 20% reduction in average minimum lot size or lot area per unit requirements, is allowed in order to accommodate the density

transfer. Developments utilizing a transfer of density will need to apply for a Planned Development pursuant to Chapter 17.51/

- C. If Density Transfer is Not Feasible. In situations where density transfer is not feasible, a maximum of one dwelling unit per 2.5 acres may be allowed on land zoned for residential use within the NH-P Subdistrict, consistent with the recommendations of a geotechnical engineering study and any conditions required by the review authority.*
- D. Recording of Density Transfer. In all cases where this bonus is used, covenants or other legally binding agreements that run with the land shall preclude the development of the land from which the density is transferred. The covenants or other legally binding agreements shall be recorded before the transferred density may be used.*

Public Engagement:

The City sent out notices to all impacted property owners both within the city limits and outside of the city limits but within the UGB (although the zoning overlays will not apply until such time that the property is annexed into the city limits), informing them of the proposed amendments and inviting them to one of two public information sessions hosted on March 20 and March 27. City staff also set up a project website with an interactive map to help property owners understand the hazards that were identified on their properties and have been meeting with impacted property owners to answer their questions and concerns.

Staff Recommendation:

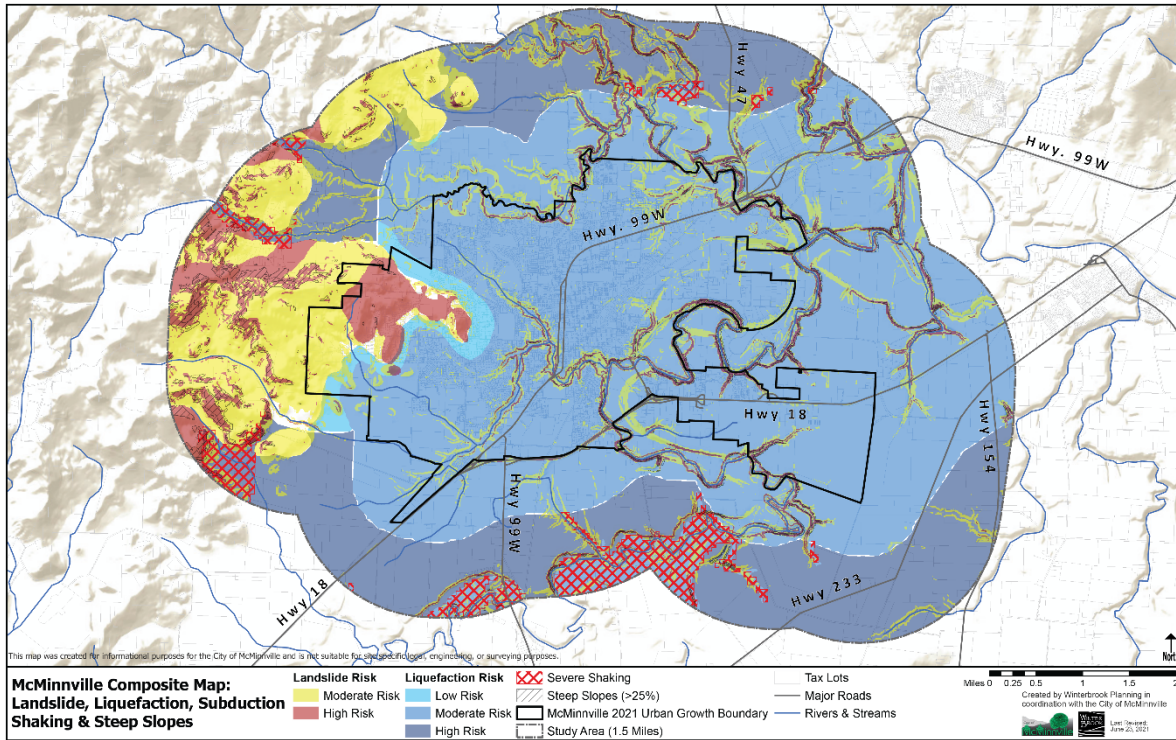
Staff is recommending that the Planning Commission host the public hearing, listen to public testimony, and continue the public hearing to Thursday, May 4, so that the City can respond to concerns raised and continue to evaluate the provisions of the program. Many questions and concerns that we heard during the public information sessions have been answered, but some of the questions we are still researching, such as:

- Will ADUs be allowed on the NH-P lands as part of the 50% expansion provisions?
- Although land division is not allowed unless through a planned development process on the NH-P lands, would a boundary line adjustment be allowed?
- Would the conversion of a single dwelling unit into multiple units through the missing middle housing provisions be allowed on the NH-P lands, and how would this apply to the 50% expansion provisions of existing structures?

Attachments:

- Attachment 1 - 2021 Natural Hazards Inventory & Management Program Options and Recommendations Plan.
- Attachment 2 - Appendix 1: Best Natural Hazards Practices Memorandum
- Attachment 3 - Appendix 2: Natural Hazard Overlay Methodology
- Attachment 4 - Appendix 3: Revised Natural Hazard Inventory and Natural Hazard Overlay Maps

- Attachment 5 – McMinnville Comprehensive Plan Text Amendments (Chapter XI, Natural Features)
- Attachment 6 – McMinnville Municipal Code Text Amendments (Chapter 17.48,00 Flood Plain Area Zone and 17.49.00 – Natural Hazard Overlay Subdistricts)
- Attachment 7 – McMinnville Zone Map Amendments for Natural Hazard Mitigation and Protection Overlays (NH-M and NH-P)
- Attachment 8 – Oregon Land Use Goal #7
- Attachment 9 – City of McMinnville Addendum to the Yamhill County Multi-Jurisdictional Hazard Mitigation Plan



Natural Hazards Inventory & Management Program Options and Recommendations

Prepared by:



Winterbrook Planning | June 24, 2021 | Draft

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Appendices

The following appendices support this report.

- Appendix 1: Best Natural Hazards Mitigation Programs in Comparator Cities**
- Appendix 2: Natural Hazard Overlay Methodology**
- Appendix 3: REVISED Natural Hazard Inventory and Natural Hazard Overlay Maps**

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Acronyms and Abbreviations

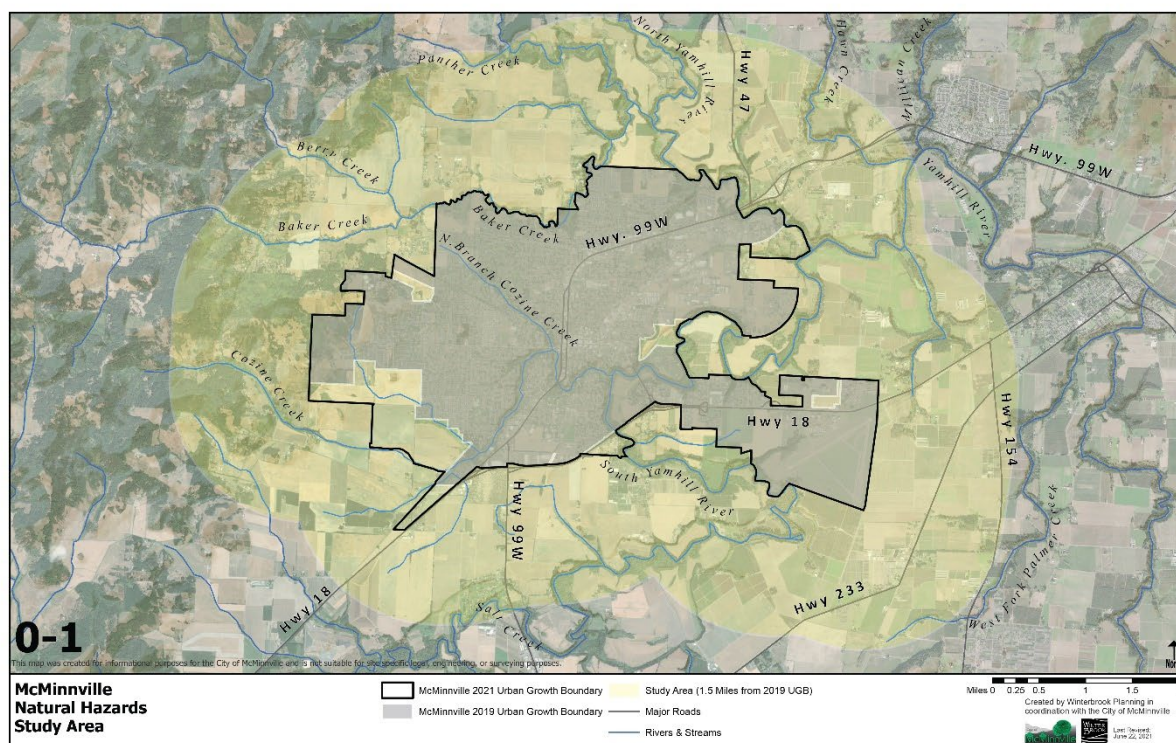
The following acronyms and abbreviations are used in this report.

- **BFE** – Base Flood Elevations
- **Cascadia** or **CSZ** — Cascadia Subduction Zone earthquake
- **CWPP** – *Yamhill County Community Wildfire Protection Plan*
- **DEM** – Digital Elevation Model
- **DOGAMI** – Oregon Department of Geology and Mineral Industries
- **FEMA** – Federal Emergency Management Agency
- **FIRM** – Flood Insurance Rate Map
- **Floodplain** – the 100-year floodplain including the floodway
- **GIS** – Geographic Information System
- **LIDAR** – Light Detection and Ranging
- **McMinnville NHMP** – *McMinnville Addendum to the Yamhill County Natural Hazards Mitigation Plan*
- **NFIP** – National Flood Insurance Program
- **NHO** – Natural Hazards Overlay (Comprehensive Plan Map Overlay)
 - **NH-M Subdistrict** – Natural Hazard Mitigation Subdistrict (Zoning Map Overlay)
 - **NH-P Subdistrict** – Natural Hazard Protection Subdistrict (Zoning Map Overlay)
- **OWRE** – *Oregon Wildfire Risk Explorer*
- **Oregon NHMP** – *Oregon Natural Hazards Mitigation Plan (2020)*
- **RFPD** – Rural Fire Protection Districts
- **SFHA** – Special Flood Hazard Area
- **Study Area** – the Natural Hazard Study Area (including land 1.5 miles from the 2019 UGB)
- **UGB** – McMinnville Urban Growth Boundary
- **UGMA** – Urban Growth Management Agreement
- **WUI Zone** – Wildland Urban Interface Zone

Introduction and Project Summary

In 2020, Winterbrook prepared the initial draft of the McMinnville Natural Hazards Inventory, Management Program Options and Recommendations study. The study area included (a) the McMinnville Urban Growth Boundary (UGB) as it existed in June 2020¹ and (b) the UGB expansion study area within 1.5 miles of the existing UGB². The City considered inventory information provided in the initial draft report during the UGB amendment process. In December 2020, the City Council amended its UGB to include approximately 1,280 acres of land (of which 921 acres were considered “buildable”). The County subsequently adopted, and the Land Conservation and Development acknowledged, the UGB amendment. Figure 0-1 shows the 2021 UGB expansion area in relation to the previously existing 2019 and the Natural Hazards Study Area.

Figure 0-1 McMinnville 2019 UGB, 2021 UGB, and Natural Hazards Study Area



In March 2021, the City contracted with Winterbrook Planning to revise the 2020 Natural Hazards Study to:

- Focus on the expanded 2021 UGB
- Include social vulnerabilities described in the *Oregon Natural Hazards Mitigation Plan*, (Oregon NHMP) in the Natural Hazards Composite Ranking System,
- Amend the proposed Natural Hazard Mitigation and Protection maps accordingly, and
- Prepare draft amendments to the McMinnville Zoning Ordinance to include natural hazard mitigation and protection subdistrict maps and text.

¹ Referenced throughout this document as the 2019 UGB. (1 and 2 ? where are these referenced?)

² Referenced throughout this document as the 2021 UGB.

This report represents the revised study including an inventory of natural hazards based on available mapping sources, considers alternative management options, and suggests policy and mapping amendments to the McMinnville Comprehensive Plan to systematically address McMinnville’s mappable natural hazards within the 2021 UGB.³

The revised Natural Hazards Inventory includes a series of GIS (geographic information system) overlay maps showing moderate, high and severe hazard areas within the 2021 UGB and study area. The inventory also includes a description of the following natural hazards and how they may adversely affect life and property:

- **Geological Hazards** (areas subject to landslide, steep slope and earthquake liquefaction and shaking impacts)
- **Flood Hazards** (areas within the 100-year floodplain including the floodway)
- **Wildfire Hazards** (areas that are particularly susceptible to wildfires due to topography, fuel and settlement patterns)
- **Composite Hazards** (areas with one or more overlapping natural hazard categories)

McMinnville Comprehensive Plan

This revised study helps to implement recent amendments to the *McMinnville Comprehensive Plan* (Comprehensive Plan) to incorporate Great Neighborhood Principles and implementing policies.

Policy 187.40 The Great Neighborhood Principles shall guide long range planning efforts including, but not limited to, master plans, small area plans, and annexation requests. The Great Neighborhood Principles shall also guide applicable current land use and development applications.

Policy 187.50.1 directly addresses natural features (including Natural Hazard Management):

1. **Natural Feature Preservation.** Great Neighborhoods are sensitive to the natural conditions and features of the land. a. Neighborhoods shall be designed to preserve significant natural features including, but not limited to, watercourses, sensitive lands, steep slopes, wetlands, wooded areas, and landmark trees.

The existing comprehensive plan addresses flood hazards only – consistent with Federal Emergency Management Agency (FEMA) regulations related to the National Flood Insurance Program (NFIP). The current comprehensive plan does not have a separate natural hazards element. The McMinnville Zoning Ordinance has a separate F-P Flood Hazard Zone that applies to land within the 100-year floodplain. However, the City currently lacks development standards for geological and wildfire hazards. The McMinnville Buildable Lands Inventory (ECONorthwest, 2003) identifies slopes of 25% or greater and floodplains as unbuildable consistent with applicable state law.

³ Winterbrook addresses relationships among natural hazards and natural resources (such as riparian and upland wildlife habitat and scenic views and viewpoints) in a separate white paper.

McMinnville Natural Hazards Mitigation Plan

Recognizing that McMinnville is subject to several other natural hazards, the City has participated in the preparation of the *McMinnville Addendum to the Yamhill County Natural Hazards Mitigation Plan* (McMinnville NHMP).⁴

The mission of the McMinnville NHMP is:

To promote public policy and mitigation activities which will enhance the safety to life and property from natural hazards.

The McMinnville NHMP includes the following natural hazard goals related to the management of natural hazards:

GOAL 4: PREVENTIVE: *Develop and implement activities to protect human life, commerce, and property from natural hazards. Reduce losses and repetitive damage for chronic hazard events while promoting insurance coverage for catastrophic hazards.*

GOAL 6: IMPLEMENTATION: *Implement strategies to mitigate the effects of natural hazards and increase the quality of life and resilience of economies in Yamhill County.*

GOAL 7: DEVELOPMENT: *Communities appropriately apply development standards that consider the potential impacts of natural hazards.*

The McMinnville NHMP includes a series of GIS hazard maps and recommends specific “measures” to implement these goals. These recommended natural hazard mitigation measures, along with the natural hazard management practices of six comparable Oregon cities, provide the foundation for developing a geographically based natural hazards management program.

Oregon Natural Hazards Mitigation Plan

The Oregon NHMP was amended in 2020 and incorporates social equity factors when ranking natural hazard risks. Broadly, the State risk assessment is based on 3 variables, (1) the probability of the event happening, (2) the physical vulnerability of the event happening, and (3) the social vulnerability of the event happening. The Oregon NHMP groups these factors by county. Winterbrook included the State’s ranking for physical and social vulnerabilities with the localized probability of the natural hazard event occurring. This inclusion provides the revised ranking system presented in Chapters V and VI of this report.

Statewide Planning Goal 7 (Natural Hazards)

As recognized by Goal 7 (Natural Hazards), natural hazards pose risks to life and property that can be mitigated by effective planning. Goal 7 requires each local government to identify and develop programs to mitigate impacts for natural hazards.

A. NATURAL HAZARD PLANNING:

- 1. Local governments shall adopt comprehensive plans inventories, policies and implementing measures) to reduce risk to people and property from natural hazards.*

⁴ The McMinnville NHMP also considers information found in the *Yamhill County Community Wildfire Protection Plan* (Yamhill County CWPP).

2. Natural hazards for purposes of this goal are: floods (coastal and riverine), landslides, earthquakes and related hazards, tsunamis, coastal erosion, and wildfires. Local governments may identify and plan for other natural hazards.

This report meets Goal 7 requirements by (a) inventorying natural hazards and assessing the risks they pose to people and property and (b) recommending a program to mitigate the effects of mapped natural hazards within the McMinnville UGB and study area.

Overlapping Natural Hazards

In this report, Winterbrook also looks at relationships that exist among natural hazards based on a series of geographic information system (GIS) overlay maps.

- For example, McMinnville’s West Hills and associated downslope areas are especially threatened by a combination of geological, wildfire and flood hazards.
- In low-lying areas, the Yamhill River and its tributaries are subject to overlapping flooding, slide hazards (bank failures) and wildfires fueled by riparian vegetation in dry conditions.
- Most of the McMinnville study area outside the West Hills is subject to strong or very strong earthquake liquefaction and shaking hazards due to underlying soil conditions.

Recognizing these inter-relationships and the threats posed by natural hazards to people, public infrastructure and private property, Winterbrook proposes a natural hazards mitigation program that addresses the combined impacts of geological, flood and wildfire hazards. The proposed program includes amendments to the McMinnville Comprehensive Plan and Plan Map that would include:

- A new Chapter XI: Natural Features that includes policies addressing multi-hazard, geological, flooding and wildfire impacts and mitigation within the McMinnville Natural Hazards Study Area.
- A new Natural Hazards Overlay Map that would be implemented by two zoning subdistricts – with graduated development standards depending on the combination of and severity of hazards found in specific geographic subareas in the community.

Report Organization

In addition to the Introduction, this report is organized into seven sections:

- **Section I Revised Inventory Methods** and information sources. The study area includes land within the McMinnville 2021 UGB and land within 1.5 miles of the 2019 UGB. The Inventory considers mappable geological, flooding and wildfire hazard areas.
- **Section II Revised Geological Hazards Inventory** is based on the McMinnville NHMP (which in turn is largely based on Oregon Department of Geology and Mineral Industries (DOGAMI) data). The Geological Hazards Inventory focuses on land within the McMinnville study area and includes areas susceptible to landslides, earthquake liquefaction and earthquake shaking. Inventory maps show moderate, high and severe hazard areas and include descriptions of and threats from each type of geological hazard.

- **Section III Revised Flood Hazard Inventory** is based on existing FEMA maps of the 100-year floodplain. This inventory will likely change based on planned updates and improved data sources.
- **Section IV Revised Wildfire Hazard Inventory** is based on the McMinnville NHMP, the Yamhill County CWPP, and application of the *Oregon Wildfire Risk Explorer* to the McMinnville study area.
- **Section V Natural Hazards – Cumulative Impacts Analysis** is based on Winterbrook’s analysis of overlapping natural hazards maps to better understand the spatial relationships that exist among McMinnville’s geological, flooding and wildfire hazard areas. The revised Section V incorporates social factors from the Oregon NHMP.
- **Section VI Natural Hazards Management Options** is based on the recommendations of the McMinnville NHMP, the management programs of six comparator communities, the McMinnville-specific natural hazards inventory found in Sections II-V, and recognition of the cumulative impacts of overlapping natural hazards in McMinnville’s West Hills and lower elevation drainage systems.
- **Section VII Natural Hazards Program Recommendations** is based on information found in Sections I – VI, comments from the McMinnville planning staff, evaluation of natural hazards programs in other communities, and Winterbrook’s experience in preparing natural features management plans. Section VII provides the basis for Zoning Ordinance amendments that include text and maps for Natural Hazard Mitigation and Protection Subdistricts.

I. Natural Hazards Inventory Methods

Information Sources

Winterbrook conducted the McMinnville Natural Hazards Inventory in May and June of 2020 using publicly available sources of hazard information from:

- The Oregon Department of Geology and Mineral Industries (DOGAMI). DOGAMI GIS data is publicly accessible via the [Oregon HazVu: Statewide Geohazards Viewer](#);⁵
- The *McMinnville Addendum to the Yamhill County Natural Hazards Mitigation Plan* (McMinnville MHMP); and
- The *Yamhill County Community Wildfire Protection Plan* (CWPP). Wildfire risk information is available for Oregon regions by using the [Oregon Wildfire Risk Explorer](#).⁶
- Winterbrook amended the natural hazards ranking system to incorporate social indicators found in the 2020 Oregon NHMP in April-May 2021.

The McMinnville Natural Hazards Study Area

Working with Senior Planner Tom Schauer in 2020, Winterbrook reviewed GIS data sources for the Natural Hazards Study Area, which included two subareas shown in Figure I-1: (a) land within the McMinnville 2019 UGB and (b) land within UGB expansion study areas – generally 1.5 miles from the 2019 UGB.⁷

Mappable Hazards

In this study, Winterbrook focused on natural hazards within the 2021 McMinnville UGB that are (a) mappable using GIS technology (i.e., flood plains, steep slopes, soils subject to earthquake liquefaction and shaking, landslide areas, and areas susceptible to wildfires) and (b) classified in the McMinnville NHMP (which in turn is based on DOGAMI and CWPP information) as having moderate and high risk. Such areas are potentially subject to natural hazards overlay zones that include development standards to mitigate impacts.

The draft McMinnville NHMP describes and ranks McMinnville’s vulnerability to the following mappable natural hazards⁸ and suggests hazard-specific mitigation measures for moderate and high-risk hazards:

- Earthquake hazards (crustal and Cascadia Subduction Zone);
- Landslide and erosion hazards (including steep slopes);
- Flood hazards; and
- Wildfire hazards.

Working with City staff, Winterbrook prepared GIS base maps for moderate and high-risk natural hazard areas. As noted above, this analysis relies primarily on statewide mapping information provided by DOGAMI for flood

⁵ <https://www.oregongeology.org/hazvu/>

⁶ https://tools.oregonexplorer.info/OE_HtmlViewer/index.html?viewer=wildfireplanning

⁷ The 1.5 mile study area represents an area of mutual interest between the city and county and area that was under consideration by the City of McMinnville for potential UGB expansion in 2020.

⁸ Since only mappable hazards are subject to overlay zoning overlay regulations, Winterbrook did not consider drought, severe weather and volcanic events in this inventory.

and geological hazards. To map wildfire hazards we used the [Oregon Wildfire Risk Explorer](#) to generate several wildfire risks maps.

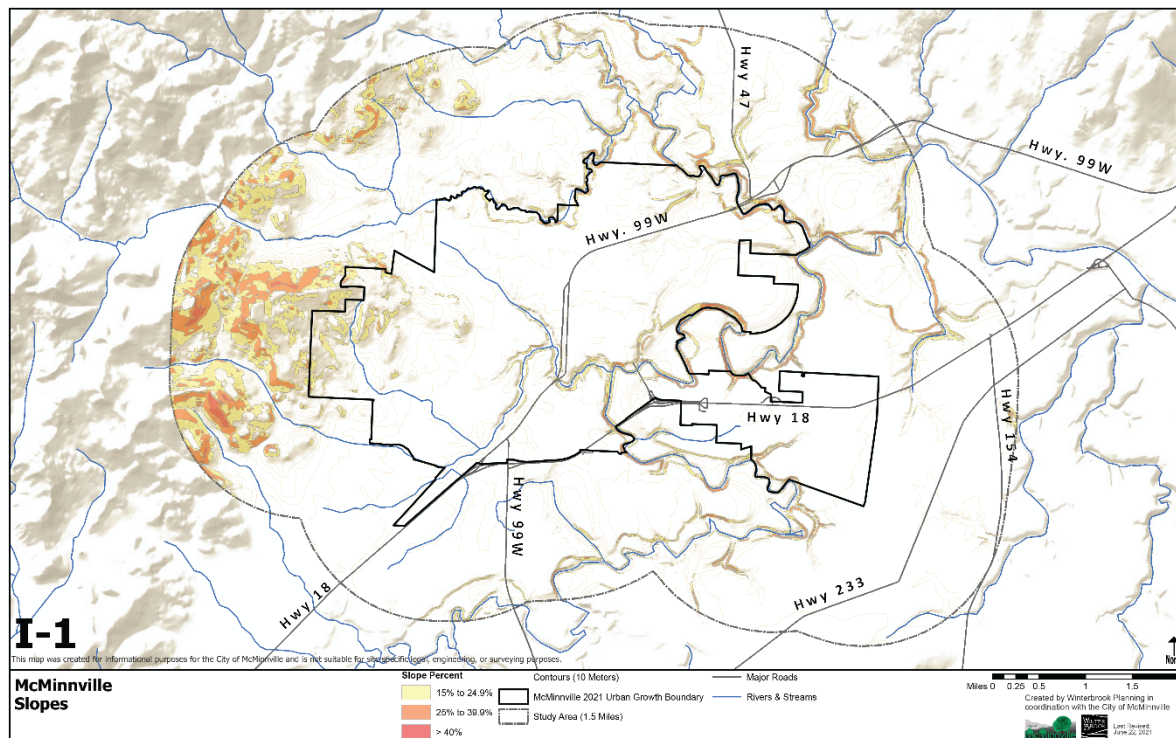
As discussed in Section V of this report, Winterbrook also prepared several composite hazard maps that show spatial relationships among geological, flooding and wildfire hazards. In 2021, Winterbrook worked with Associate Planner Jamie Fleckenstein to incorporate social indicators from the Oregon NHMP into this revised 2021 inventory.

Figure I-1 shows three slope categories within the McMinnville study area that are related to the location and severity of geological, flood (stream bank erosion) and wildfire hazards.

McMinnville Slope Hazards

Steep slopes are associated with wildfire hazards and geological hazards. Slope percentage is used by many jurisdictions to determine whether geological studies should be required prior to development. Slopes of 25% or greater are considered “unbuildable” when preparing buildable lands inventories under state housing rules. (OAR 660-008-005 Definitions) The City of McMinnville also requires sprinkler systems to reduce fire hazards on slopes of 15% or greater. For these reasons, slope percentage is considered in several of the composite maps found in the natural hazards inventory. Steep slopes are found mostly in McMinnville’s West Hills and define the banks of the study area streams and rivers.

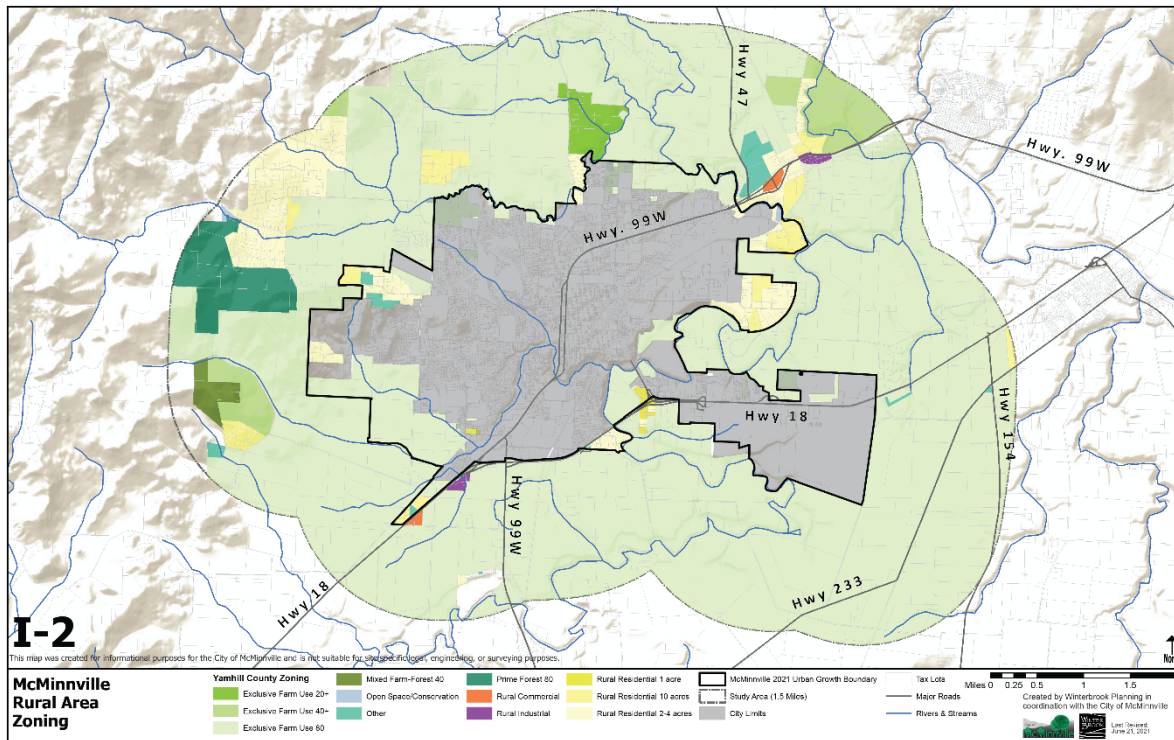
Figure I-1 McMinnville 2021 UGB and Study Areas Slopes



Yamhill County Zoning

Figure I-2 shows Yamhill County zoning outside the McMinnville City Limits. County zoning partially determines land use and density outside the 2021 McMinnville UGB – which in turn is related to hazard vulnerability to life and property. A larger scale and more readable zoning map is available in 11" X 17" format. In Yamhill County land that is zoned for forest use (the Agricultural Forest and Forestry Districts) in the forested West Hills is subject to specific wildfire protection (fuel reduction zones, fire suppression and access) standards for new structures.

Figure I-2 County Zoning within Study Area



II. Geological Hazards Inventory

Section II considers landslide, earthquake and steep slope hazards both individually and in combination.

Data Sources

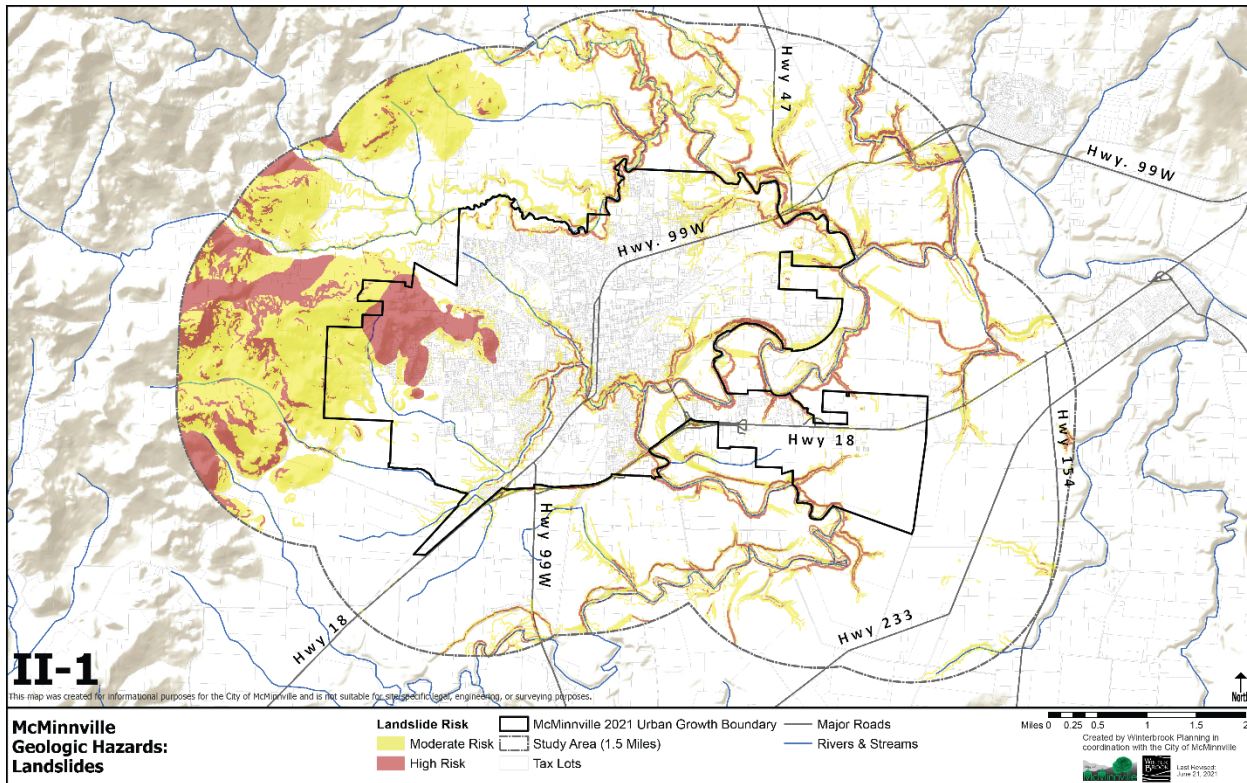
Winterbrook relied on landslide and slope hazard maps available on DOGAMI's Statewide Geohazards Viewer to identify potential landslide and slope hazards:

- DOGAMI: Landslide susceptibility
- DOGAMI: Landslide inventory - Statewide Landslide Information Database for Oregon (SLIDO)
- DOGAMI LIDAR: Hillshade and slope
- DOGAMI: Earthquake shaking and liquefaction risks

Landslide Hazard

The McMinnville NHMP describes and maps areas with moderate and high landslide hazard susceptibility based on the HazVu: Statewide Geohazards Viewer (DOGAMI). Figure II-1 shows moderate and high-risk landslide areas within the study area.

Figure II-1 Geological Hazards: Moderate and High Landslide Risk



Areas that are moderately and highly prone to landslides are found predominately in McMinnville’s West Hills and secondarily along Baker Creek, Berry Creek, Cozine Creek and South Yamhill River embankments. Two high-risk landslide areas are located in McMinnville’s West Hills: at lower elevation in the western extension of the UGB and at higher elevation in the western extension of the study area. Note that a large band of moderate landslide risk separates these two high-risk areas.

Earthquake Hazards

The McMinnville NHMP and this inventory consider and map the effects of two types of earthquakes:

1. Crustal earthquakes that could emanate from nearby faults and/or zones; and
2. The Cascade Subduction Zone Earthquake.

Potential earthquake hazards include two related and mappable effects: shaking from ground motion and liquefaction due to porous or “soft” soils can result from both types of earthquakes. Earthquakes can also trigger landslides in areas shown on Figure II-1.

Crustal and Cascadia Subduction Zone Earthquakes

The Yamhill County Multi-Jurisdictional NHMP describes the two types of earthquakes and explains their hazardous effects as follows (pp. 4-10 and 4-11):

“An earthquake is a sudden motion or trembling of the earth produced by the rupture of rocks due to stresses beyond the rocks’ elastic limits. The effects of an earthquake can be felt far beyond the site of its occurrence. Earthquakes usually occur without warning and, after just a few seconds, can cause massive damage and extensive casualties. The most common effect of earthquakes is ground motion, or the vibration or shaking of the ground during an earthquake.

The severity of ground motion generally increases with the amount of energy released and decreases with distance from the fault or epicenter of the earthquake. Ground motion causes waves in the earth’s interior, also known as seismic waves, and along the earth’s surface, known as surface waves. ...

In addition to ground motion, several secondary hazards can occur from earthquakes, such as surface faulting. Surface faulting is the differential movement of two sides of a fault at the earth’s surface. Displacement along faults, both in terms of length and width, varies but can be significant (up to 20 feet), as can the length of the surface rupture (up to 200 miles). Surface faulting can cause severe damage to linear structures, such as railways, highways, pipelines and tunnels.

Earthquake-related ground failure due to liquefaction is another secondary hazard. Liquefaction occurs when seismic waves pass through saturated granular soil, distorting its structure, and causing some of the empty spaces between granules to collapse. Porewater pressure may also increase sufficiently to cause the soil to briefly become fluid.

Liquefaction causes lateral spreads (horizontal movements of commonly 10 to 15 feet, but up to 100 feet), flow failures (massive flows of soil, typically hundreds of feet, but up to 12 miles) and loss of bearing strength (soil deformations causing structures to settle or tip). Liquefaction can cause severe damage to property.

The most common earthquakes that occur in Oregon are crustal, intraplate or great subduction earthquakes. Yamhill County is most susceptible to deep intraplate and subduction zone earthquakes. These are described as follows:

Crustal earthquakes: *These generally occur along shallow faults near the earth’s surface. Crustal earthquakes make up the majority of earthquakes in the Cascadia area (western Washington, Oregon and northwestern California) and are a result of fault movement in the Earth’s surface. These shallow earthquakes are usually less than 7.5 magnitude and strong shaking generally lasts 20 to 60 seconds. Aftershocks, as well as tsunamis and landslides, are anticipated after a crustal event. The Mount Angel Fault is located approximately 15 miles from Yamhill County, and is responsible for the 5.7 magnitude Spring Break Quake in 1993.*

Great subduction earthquakes: occur offshore of the Oregon and Washington Coasts along the Cascadia Subduction Zone. This zone is the result of the Juan de Fuca plate being pushed under the North American plate. Earthquakes centered along this zone can be as great as 9.0 magnitude. Geologic evidence demonstrates approximately 500 years between events with the last significant event on January 26, 1700. Aftershocks up to 7.0 magnitude are anticipated to cause additional damage. Liquefaction, tsunamis and landslides are expected as a result of a great subduction earthquake.

Quoting from the DOGAMI website <https://www.oregongeology.org/earthquakes/earthquakehome.htm>

Earthquake hazards have been recognized as one of the major natural hazards in Oregon since the late 1980s, a result of the geologic research to identify and characterize the Cascadia subduction zone and crustal faults. The March 1993 Scotts Mills earthquake (M5.6) and the September 1993 Klamath Falls earthquakes (M5.9 and M6.0) demonstrated the potential hazards of crustal earthquakes in Oregon.

According to the McMinnville NHMP (p. MA-37)

Within the Northern Willamette Valley that includes Yamhill County, two potential faults and/or zones can generate high-magnitude earthquakes. These include the Cascadia Subduction Zone and the Gales Creek-Newberg-Mt. Angel Structural Zone (including the Newberg Fault).

Crustal earthquakes can cause serious local damage, as recognized in the Yamhill County Natural Hazard Mitigation Plan (2014):

Crustal earthquakes also occur in the Willamette valley although with smaller expected magnitudes (M 5.0-M 7.0). Although these earthquakes are expected to be much smaller than a Cascadia Subduction Zone earthquake, they are more likely to occur close to population centers and are capable of causing severe shaking and damage in localized areas.

Although crustal earthquakes are more common than great subduction earthquakes (see <https://pnsn.org/earthquakes/recent>), the Cascadia Subduction Zone (CSZ or Cascadia) earthquake is certain to occur sometime in the future and could occur at any time.

Again, according to the McMinnville NHMP:

Cascadia Subduction Zone

The Cascadia Subduction Zone is a 680-mile-long zone of active tectonic convergence where oceanic crust of the Juan de Fuca Plate is subducting beneath the North American continent at a rate of 4 cm per year. Scientists have found evidence that 11 large, tsunami-producing earthquakes have occurred off the Pacific Northwest coast in the past 6,000 years. These earthquakes took place roughly between 300 and 5,400 years ago with an average occurrence interval of about 510 years. The most recent of these large earthquakes took place in approximately 1700 A.D.

The city's proximity to the Cascadia Subduction Zone, potential slope instability, and the prevalence of certain soils subject to liquefaction, and amplification combine to give the City a high-risk profile. Due to the expected pattern of damage resulting from a CSZ event, the Oregon Resilience Plan divides the State into four distinct zones, and places McMinnville within the "Valley Zone" (Valley Zone, from the summit of the Coast Range to the summit of the Cascades). Within the Northwest Oregon region, damage, and shaking is expected to be strong, and widespread - an event will be disruptive to daily life, and commerce, and the main priority is expected to be restoring services to business and residents.

Quoting from the Cascadia Playbook (Oregon Office of Emergency Management, 2018):

A Cascadia event is based on the threat of a catastrophic magnitude 9.0 Subduction Zone earthquake and resultant tsunami. Coastal counties will experience a devastating tsunami on top of severe ground shaking (up to five minutes). Shaking intensity will be less in the I-5 Corridor and Southern, Central, and Eastern Oregon, but older buildings may incur extended damage. Expected Impacts

- *Ground shaking for 4-6 minutes causing massive critical infrastructure damage*
- *Liquefaction and landslides causing disruption of transportation routes*
- *Tsunami inundation to coastal areas with as little as 15 minutes warning*
- *Up to 25,000 fatalities resulting from combined effects of earthquakes and tsunami*
- *Tens of thousands of buildings and structures destroyed or damaged*
- *Tens of thousands of people in need of shelter because of destroyed or damaged households*
- *\$30+ billion in economic loss*

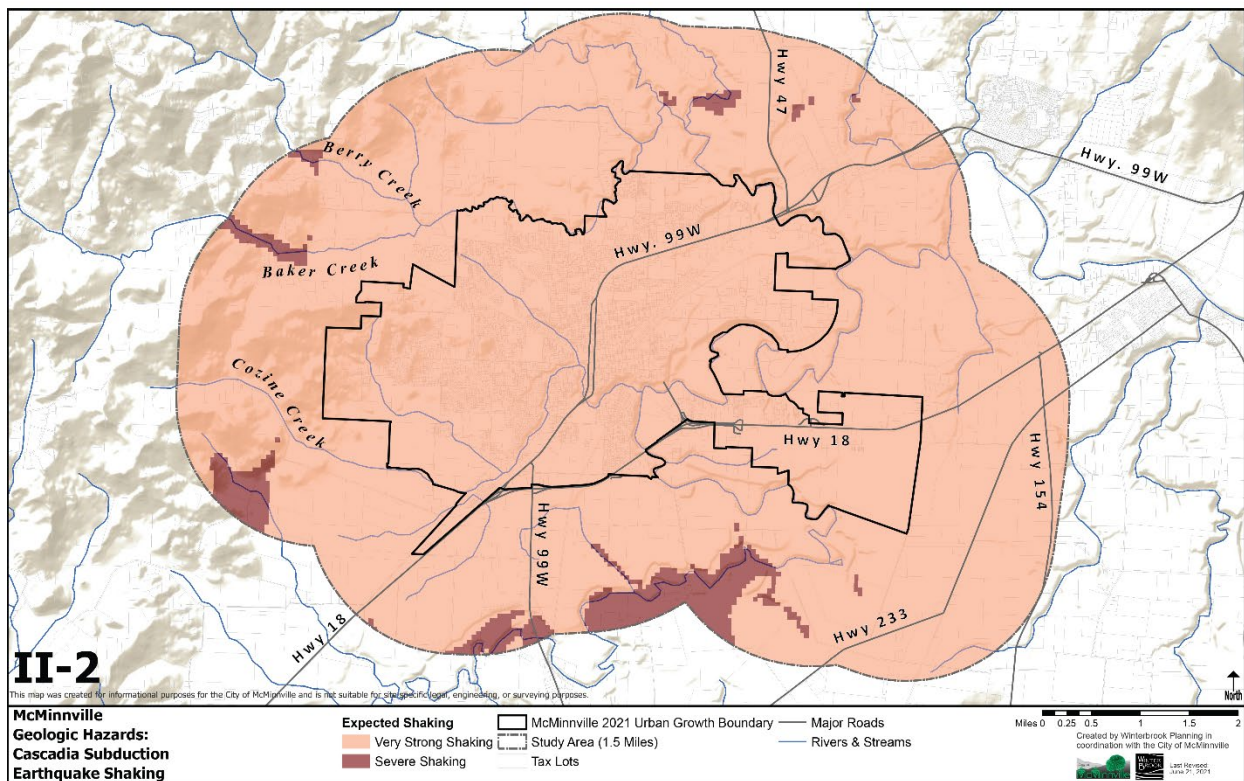
Although coastal communities will experience greater impacts than Willamette Valley communities, McMinnville's location at the base of the Coast Range makes it highly susceptible to Cascadia Subduction Zone earthquake damage. **Because the impacts from the Cascadia Subduction Zone earthquake would be so severe, Winterbrook's analysis and recommendations focus on impacts from the Cascadia event.**

Earthquake Shaking Hazard Areas

DOGAMI provides data and maps for both crustal and subduction earthquakes. Since great subduction earthquakes are more severe and has a high probability of occurring over the next 50 years, Winterbrook used DOGAMI subduction earthquake mapping for this analysis.

Figure II-2 shows areas susceptible to “very strong” and “severe” shaking that could result from the Cascadia Subduction Zone Earthquake. As with a crustal earthquake, most of the study area will experience strong shaking in the subduction earthquake. Severe shaking areas include the upper Baker Creek valley and south of Cozine Creek as well as a large area southwest of the airport. The amended UGB did not include severe shaking areas.

Figure II-2 Geological Hazards: Cascadia Subduction Earthquake Shaking Risk

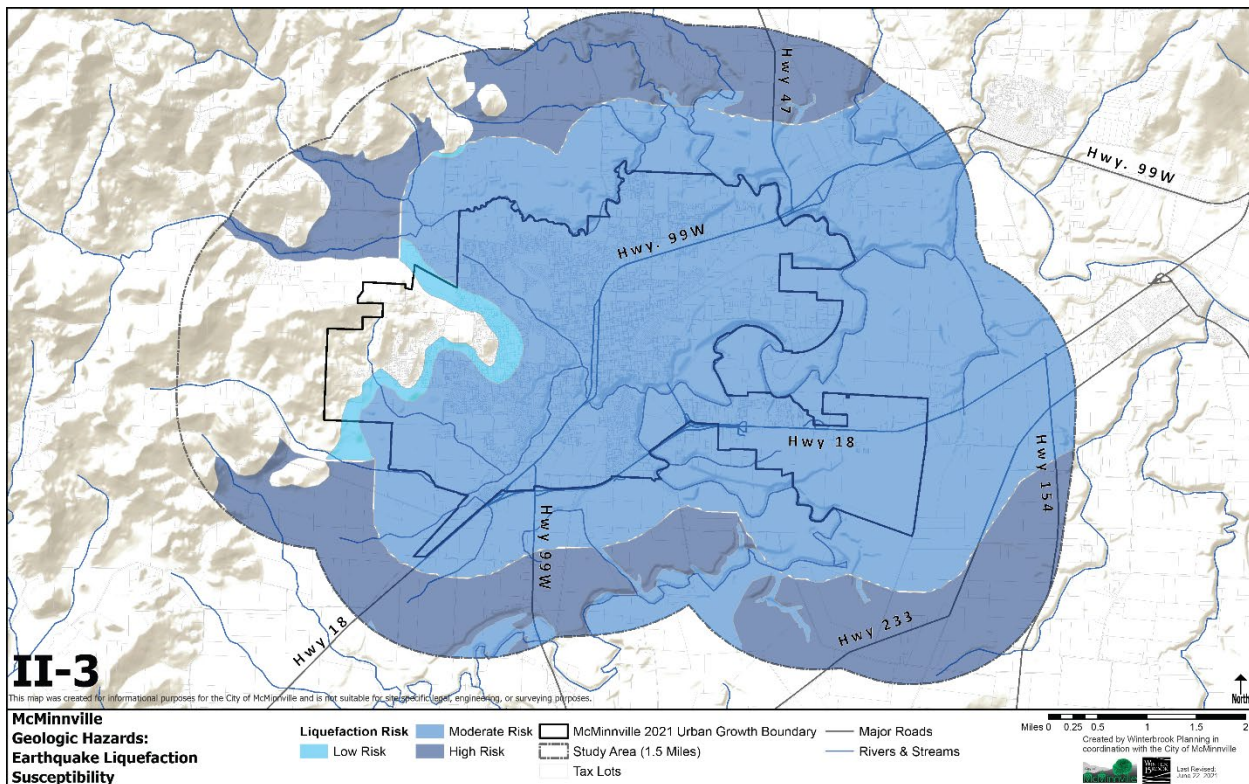


Earthquake Liquefaction Hazard Areas

Liquefaction occurs from both types of earthquakes and results from soft soils. All land within the existing UGB is subject to moderate liquefaction. Areas of moderate liquefaction extend about 0.5 miles north and south of the UGB, and much further beyond the study area boundary east of the UGB.

- Areas of high liquefaction susceptibility extend from 0.5 to 0.75 miles from the UGB to the north and south. The amended UGB did not include high liquefaction areas.
- The West Hills are characterized by high bedrock and less alluvial soil are not subject to liquefaction – except along stream corridors.
- Note the large moderate liquefaction area that extends into the high liquefaction areas southwest of the airport – at the bottom center of Figure II-4. This nodal extension is mapped as a severe shaking area on Figure II-3 which shows the relationship between moderate and high liquefaction and shaking areas.

Figure II-3 Geological Hazards: Earthquake Liquefaction Susceptibility

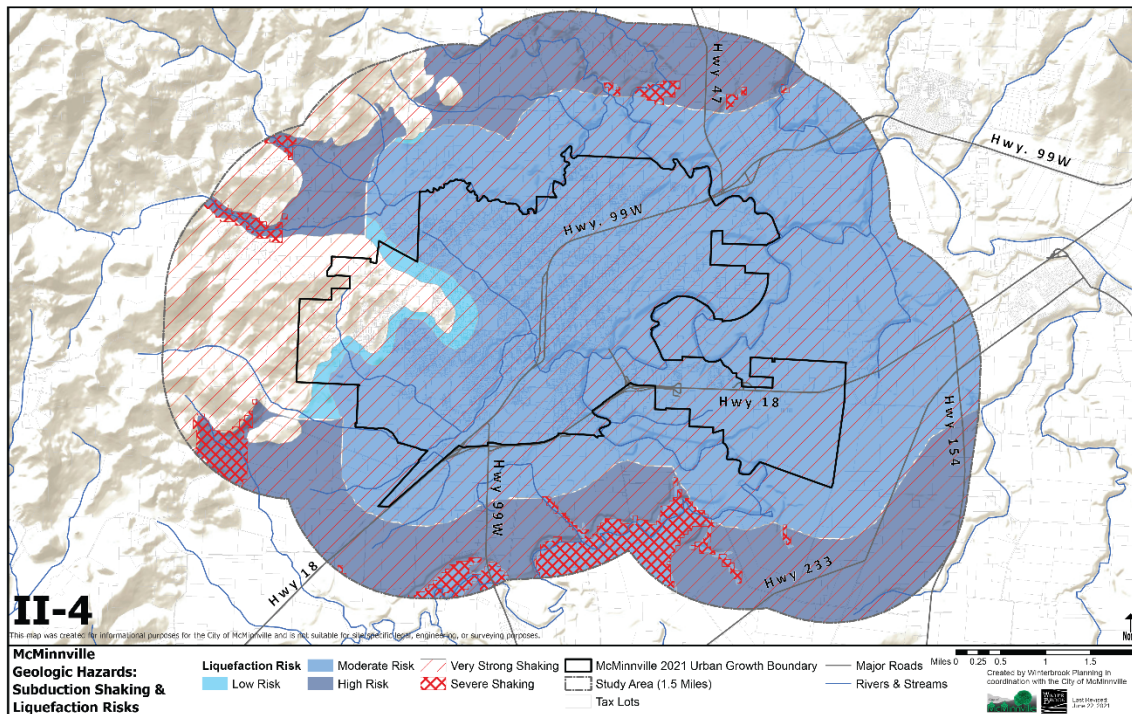


Combined Earthquake Liquefaction and Shaking Hazard Areas

Figure II-4 shows the relationship that exists among high and moderate liquefaction areas and “very strong” and “severe” earthquake shaking areas.

- Note that land within and extending outside the amended McMinnville UGB has moderate liquefaction risk and “very strong” shaking risk.
- However, a large band of high liquefaction risk and “severe” shaking risk is appears the northern and southern areas at a more or less uniform distance from the edge of the study area.
- Finally, note the severe shaking area southwest of the Airport (largely in the South Yamhill River floodplain) shown on Figure II-4 that corresponds roughly with the moderate liquefaction area shown on Figure II-3 above.
- The amended UGB did not include areas with severe shaking risk or high liquefaction risk.

Figure II-4 Geological Hazard: Cascadia Subduction Earthquake Liquefaction and Shaking Risk



Composite Geological Risk Maps

Figure II-5 is a composite map showing slopes of 15% or greater, landslide hazard and earthquake liquefaction hazard areas. We offer the following observations:

- Note the inverse relationship that exists between (a) steep slopes and the moderate to high-risk earthquake risks in the West Hills and (b) moderate to high risk earthquake liquefaction areas to the north, south and east of the UGB.
- Moderate risk geological hazard areas (relatively flat areas with moderate liquefaction hazards and low landslide hazards) are found to the north and south of the UGB. High risk earthquake liquefaction areas are located further to the northwest and south.
- In weighing geological hazard risks, it may be more advisable to direct future urban growth to areas that have areas with moderate geological hazard risk rather than higher risk areas.
- As shown more clearly on 11" by 17" maps accompanying this report, there is rough correlation between 15% and greater slopes and landslide hazard areas, indicating that slope percentage should not be the only threshold for requiring erosion control geotechnical studies.

Figure II-5 Geological Hazards Map: Landslide, Liquefaction, Subduction Shaking and Slopes

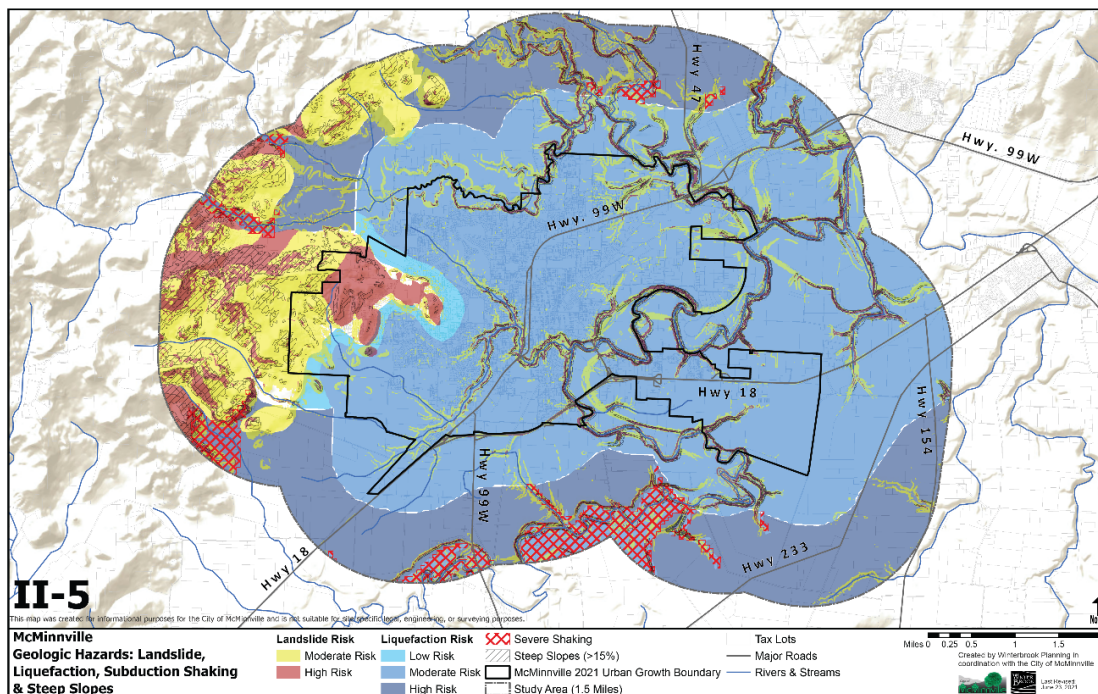
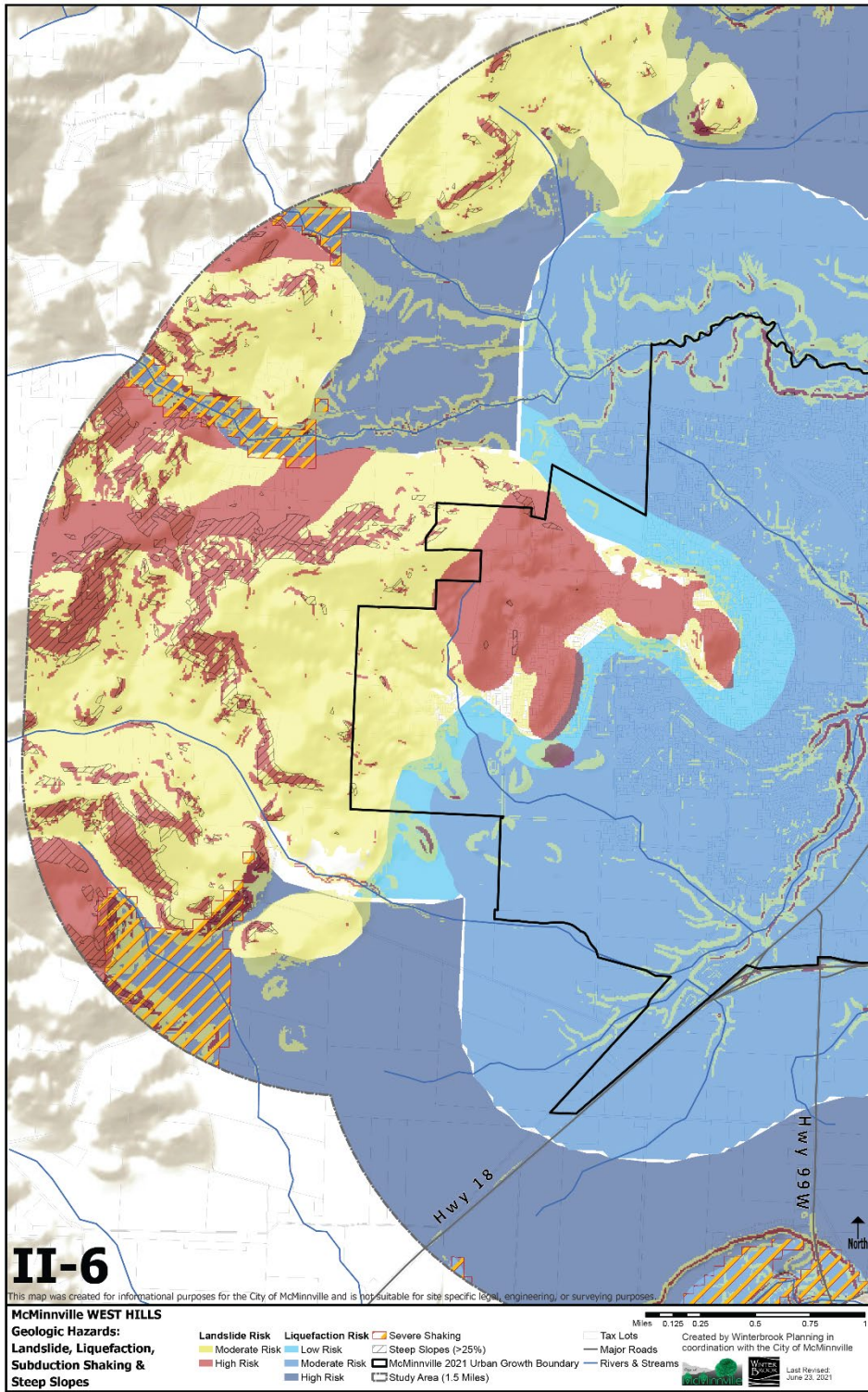


Figure II-6 zooms in on the West Hills to look more closely at the relationships among slopes of 25% and greater, moderate and high-risk landslide liquefactions areas, severe risk landslide shaking areas, and moderate to high risk landslide areas.

Please note the following:

- The high correlation between slopes of 25% or greater and high risk landslide areas.
- The inverse relationship between (a) moderate to high risk landslide areas and (b) high risk liquefaction areas and severe earthquake shaking areas north and south of the West Hills.

Figure II-6 West Hills Geological Map: Steep Slope, Severe Shaking, Landslide and Liquefaction Risk

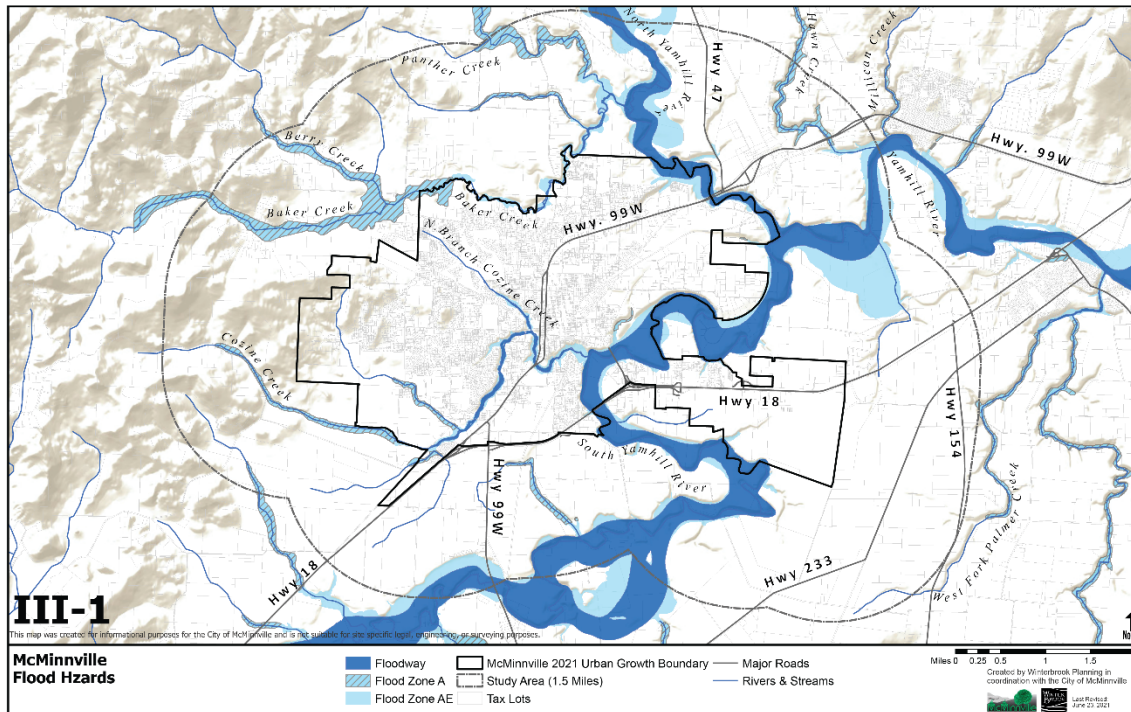


III. Flood Hazard Inventory

Flood Hazard GIS Data Sources and Analysis

Winterbrook relied on flood hazard maps available on DOGAMI's Statewide Geohazards Viewer found in the McMinnville NHMP. Flood hazards include: Zone A, Zone AE, and the Floodway.⁹ As shown on Figure III-1, flood hazards within the study area are associated with Cozine Creek, Berry Creek, Baker Creek and the Yamhill River.

Figure III-1 Flood Hazard Map



⁹ Winterbrook's understanding is FIRM maps were used as the basis for DOGAMI's statewide inventory.

FEMA Floodway Definition/Description:

A "Regulatory Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Communities must regulate development in these floodways to ensure that there are no increases in upstream flood elevations. For streams and other watercourses where FEMA has provided Base Flood Elevations (BFEs), but no floodway has been designated, the community must review floodplain development on a case-by-case basis to ensure that increases in water surface elevations do not occur or identify the need to adopt a floodway if adequate information is available.

About Flood Zones: Flood hazard areas identified on the Flood Insurance Rate Map are identified as a Special Flood Hazard Area (SFHA). SFHA are defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. SFHAs on Figure III-1 are labeled Floodway, Zone A and Zone AE. Zone A indicates areas where base flood elevations (BFE) have not been fully determined. Additional work is required to define the BFEs in the upper reaches of the Baker, Cozine and Berry Creek floodplains.

IV. Wildfire Hazard Inventory

Wildfire GIS Data Sources

The **Yamhill County Community Wildfire Protection Plan** (CWPP, Revised 2015) identifies two Wildland Urban Interface Zones (WUI Zones). Zone I is comprised mostly of commercial forest land in West Yamhill County. Zone II includes agricultural land, urban areas and forested uplands in East Yamhill County. The McMinnville study area is mostly within Zone II which includes agricultural, forest and rural residential land within the McMinnville study area.

According to the CCWP, Zone II has a “high” county-wide wildfire hazard ranking. However, some Zone II areas are more at risk than others. For example, rural residential forested slopes near the Newberg and McMinnville urban areas are more at risk than unpopulated agricultural land.

The McMinnville NHMP (pp. MA 50-52) summarizes key findings in the Yamhill County CWPP:

The location, and extent of a wildland fire vary depending on fuel, topography, and weather conditions. Weather, and urbanization conditions are primarily at cause for the hazard level. McMinnville has not experienced a wildfire within City limits. The city is surrounded by developed land, rivers, and/or irrigated agricultural land. However, some wooded areas are a concern in the case of a wildfire event, particularly in the western part of the city.

Oregon Wildfire Risk Explorer

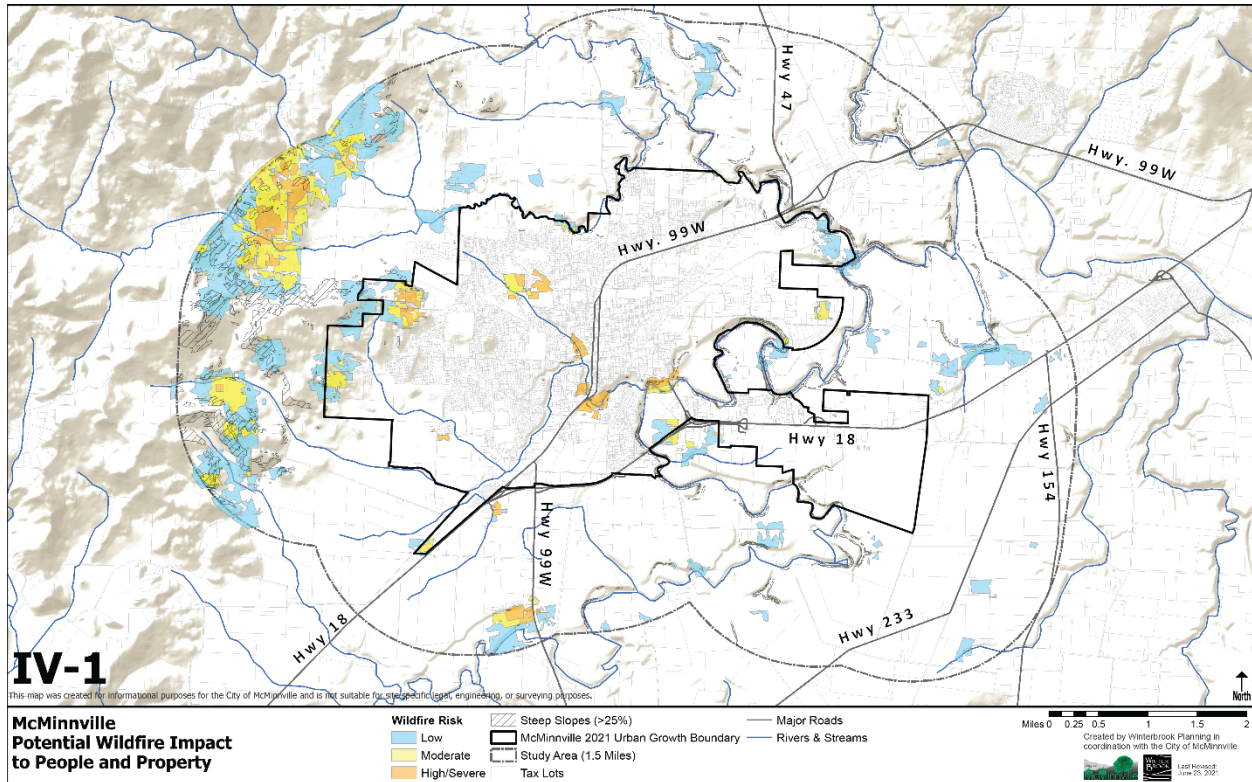
The OWRE Advanced Report provides wildfire risk information for a customized area of interest to support Community Wildfire Protection Plans (CWPPs), Natural Hazard Mitigation Plans (NHMPs), and fuels reduction and restoration treatments in wildfire-prone areas in Oregon. The OWRE Advanced Report provides landscape context of the current fire environment and fire history.

Using the *Oregon Wildfire Risk Explorer*, Winterbrook prepared an *Advanced Report* showing wildfire hazards to potential structures and the people who live and work in them. Figure IV-1 shows Wildfire Hazard to Potential Structures and the general location of McMinnville RFPD Risk Reduction Projects. According to the Risk Explorer:

Hazard to Potential Structures: *Hazard to potential structures depicts the hazard to hypothetical structures in any area if a wildfire were to occur. This differs from Potential Impacts, as those estimates consider only where people and property currently exist. In contrast, this layer maps hazard to hypothetical structures across all directly exposed (burnable), and indirectly exposed (within 150 meters of burnable fuel) areas in Oregon. As with the Potential Impacts layers, the data layer does not take into account wildfire probability, it only shows exposure and susceptibility.*

As indicated in the description above, moderate and high risk areas shown on Figure IV-1 correlate highly with rural residential areas shown on Figure I-2. Moderate risk wildfire areas continue into the western extension of the McMinnville UGB. Please note that “Potential Impacts to People and Property” focuses on areas with structures. Thus, areas without structures (mainly in steeply sloped areas) have a lower risk to people and property. Finally, as discussed in Section V, hillsides denuded by recent wildfires are more susceptible to erosion and slide hazards due to loss of stabilizing vegetation.

Figure IV-1 Wildfire – Potential Impacts to People and Property with Steep Slopes



As a reminder, Figure I-2 in Section I of this report shows Yamhill County Zoning in the Natural Hazards Study Area. Yamhill County has effective fire prevention standards for structures in County Prime Forest and Mixed Forest zones.

V. Natural Hazards – Multi-Hazard Cumulative Impacts

Composite Geological Hazard Mapping Approach

The draft McMinnville NHMP mapped and evaluated a series of natural hazards more or less in isolation. The location and severity of each was mapped and assessed and potential community impacts and mitigation measures were identified.

As noted in Section I of this report, Winterbrook used GIS maps and information found in the McMinnville NHMP but focused on mappable natural hazards that exist within the McMinnville study area.

Section II went a step further than the McMinnville NHMP by evaluating relationships that exist among overlapping geological hazards. Figures II-3 through II-5 show overlapping geological hazard maps and a brief analysis of what these overlaps mean in terms of natural hazards planning.

The following composite natural hazards map (Figures V-1 through V-3) show relationships among hazards identified in Section II (Geological), Section III (Flooding) and Section IV (Wildfire).

Figure V-1 on the following page shows that land within the McMinnville UGB – with two notable exceptions – is relatively free of high risk areas. The two exceptions within the UGB include:

1. Flood hazards generally; and
2. High landslide risk hazard areas in the lower slopes of the West Hills and adjacent floodplains.

Most of the land within the amended UGB has moderate (as opposed to high) earthquake liquefaction susceptibility. Hazard conditions outside the UGB tell a different story. The moderate risk liquefaction area extends beyond the amended UGB to the north, northwest, southwest and south for about 0.5 to 0.75 miles before reaching high liquefaction risk areas.

Figure V-1 Composite Map: Landslide, Liquefaction and Flood Hazards

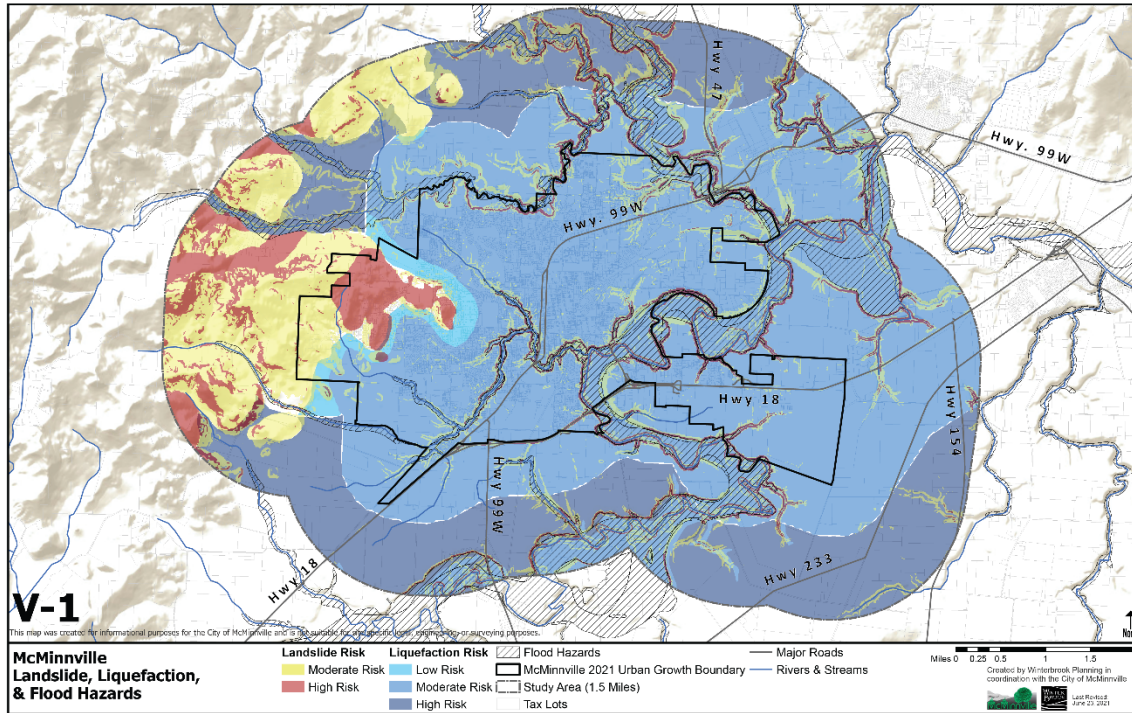


Figure V-1 shows the highest risk areas in the Natural Hazards Study Areas by mapping slopes of 25% and greater; high risk landslide, earthquake liquefaction; and the 100-year floodplain.

- This composite map makes it clear that land within the amended McMinnville UGB is relatively free of high-to-severe hazard risks.
- With the exception of the area served by Highway 18, the UGB has been largely defined by Baker and Cozine Creeks and the North and South Yamhill Rivers. Floodplains in these areas are protected from most types of development by City floodplain regulations.
- The primary high-to-severe hazards within the UGB include high risk landslide hazards in the West Hills and adjacent to protected floodplains.
- As discussed in Section II of this report (and shown on Figure II-4), high risk earthquake liquefaction and severe shaking areas are clearly defined to the west and south of the amended UGB.

To the west of the UGB, there is a moderate risk landslide area that extends to the West Hills' steeply sloped and high landslide risk areas.

Figure V-2 focuses on the West Hills in relation to lowlands west of Hwy 99W. Please note the following:

- The large high risk landslide area within the amended UGB is separated by a moderate risk landslide area just outside the UGB before reaching another band of high-risk landslide area.
- The West Hills are flanked to the north and south by high-risk earthquake liquefaction areas. As described earlier in Section II, Figure II-4 shows severe risk landslide shaking areas in Baker Creek and Cozine Creek alluvial plains.

Figure V-2 Composite Map: West Hill Slope, Landslide, High Earthquake Liquefaction Risk

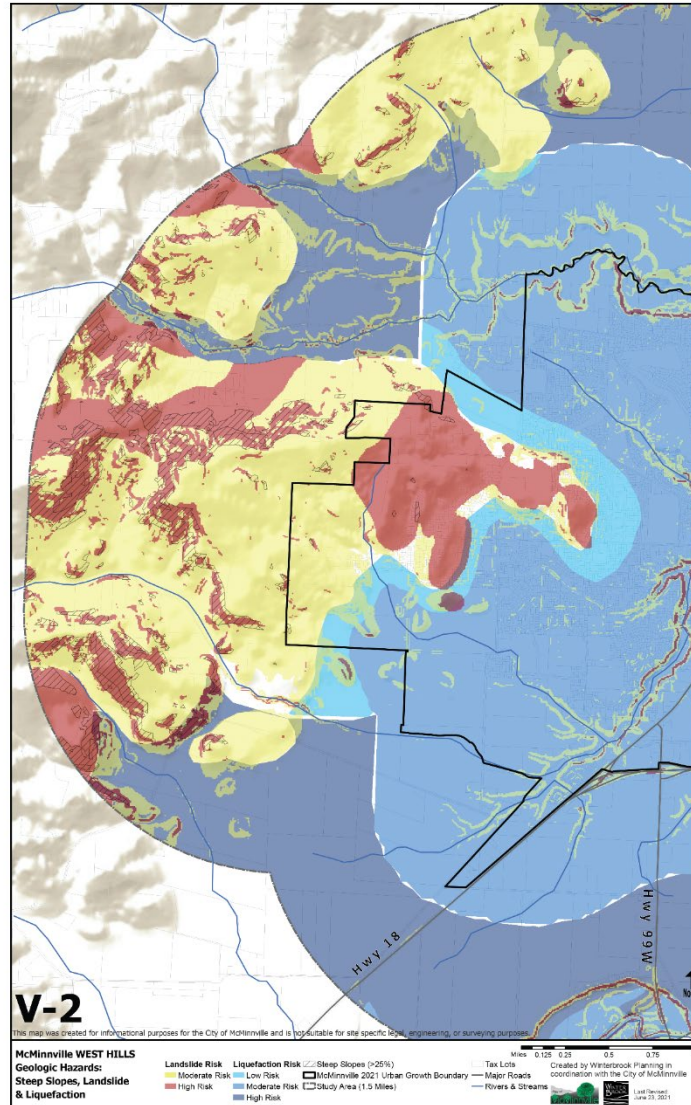


Figure V-3 shows the eastern (Valley) portion of McMinnville study area generally east of Highway 99W. The primary natural hazard in this area is flooding. Landslide hazard areas define the outer boundaries of floodplains that are subject to bank failure in high water conditions or in a major earthquake event. Note the areas of high-risk earthquake liquefaction hazards to the north and south of the UGB. In addition, the Yamhill River floodplain

southwest of the McMinnville Airport contains a severe earthquake shaking hazard area as shown in Section II on Figure II-4.

Figure V-3 Composite Map: East Valley Floodplain, Landslide and Liquefaction Risk

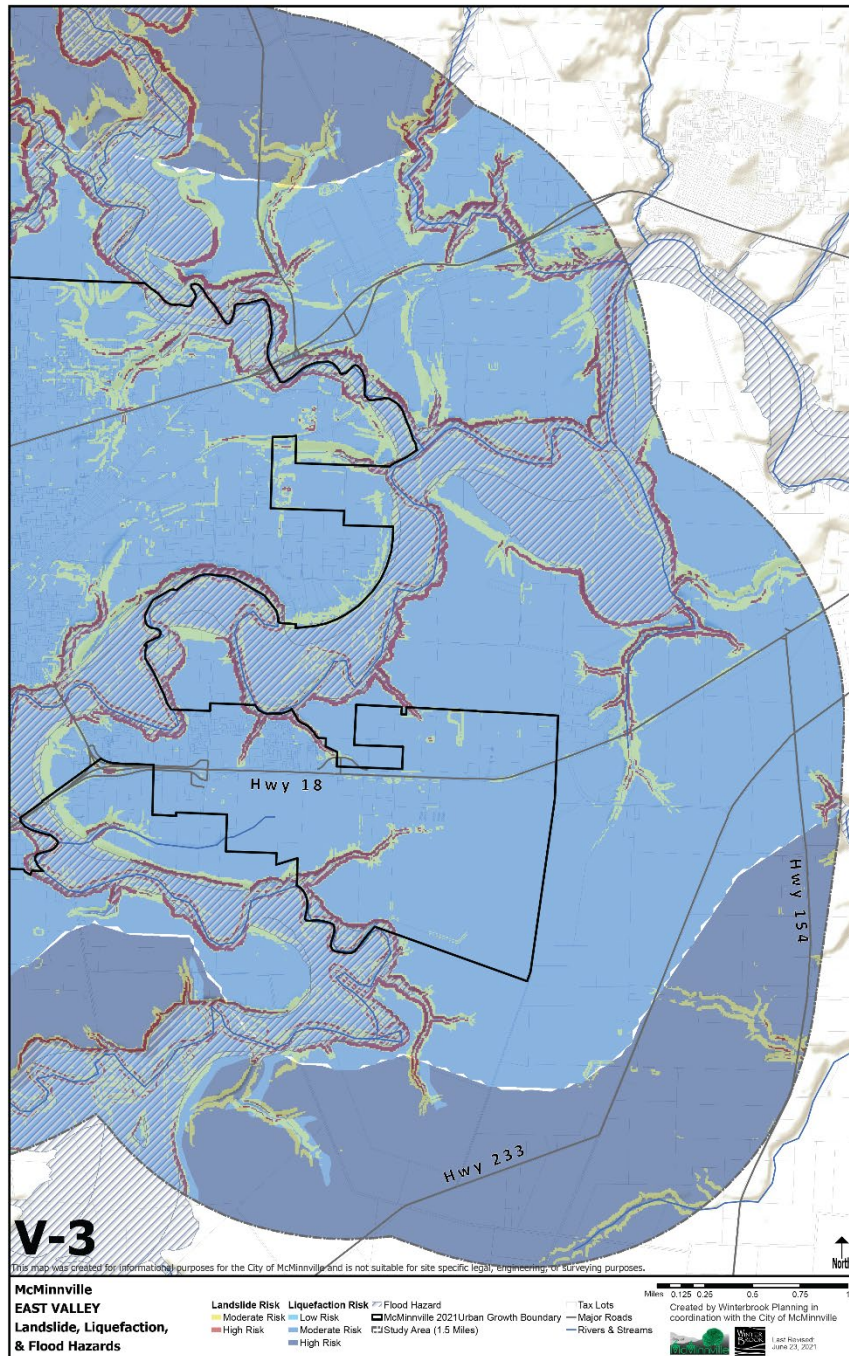


Figure V-4 combines wildfire, landslide and flood hazard risks and focuses on the West Hills and low-lying areas west of Highway 99W.

- Overall, there is some correlation between wildfire and landslide risk. Higher wildfire risk areas correlate more with rural residential development in forested hillside areas with limited access.
- Note that low wildfire risk areas correlate with undeveloped areas because wildfire risk focus on impacts to people and structures. Thus, yellow areas shown on Figure V-4 still have wildfire risk – but are unlikely to damage structures; however, the danger still exists from larger scale wildfires.
- Note also that high wildfire risks occur near vegetated stream and river corridors.
- Finally, the CWPP and the McMinnville Fire Department has observed (6/24/20) that grasslands and grain crop areas are also susceptible to wildfire risk.

Figure V-4 Composite Map: West Hills Wildfire, Landslide, and Floodplain Risk

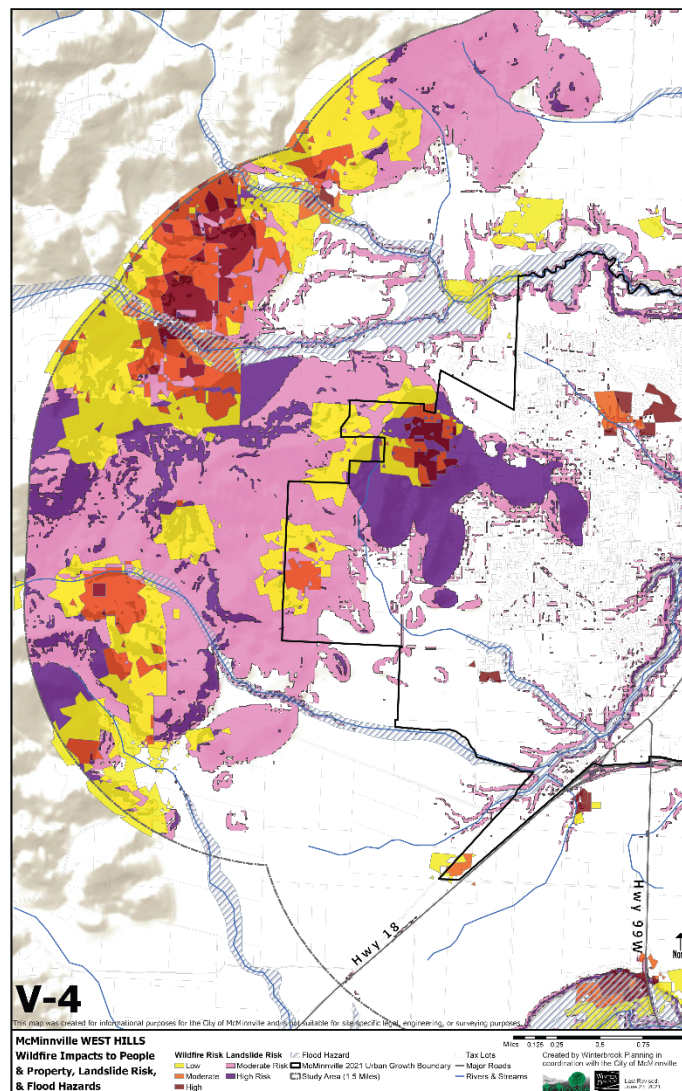
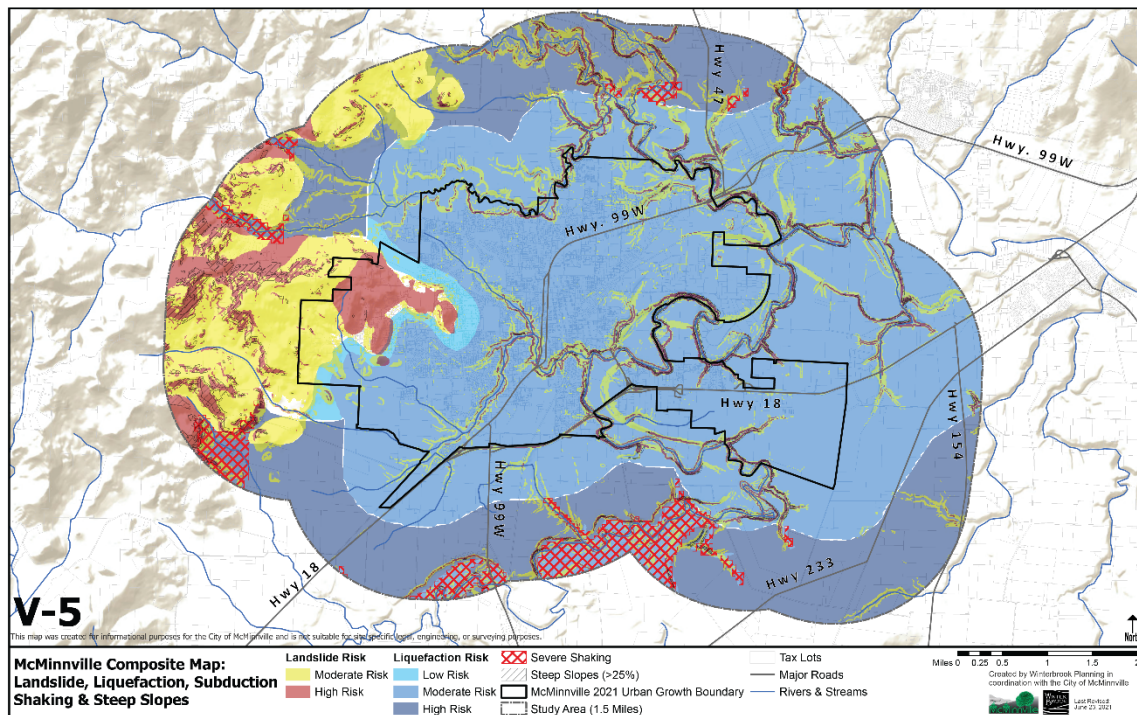


Figure V-5 combines geological hazard risks including landslides, earthquake shaking and liquefaction, and slopes of 25% or greater. As discussed in Section II of this report:

- The entire amended McMinnville UGB is subject to moderate earthquake liquefaction risk and (as shown on Figure II-4) very strong earthquake shaking risk.
- There is a band of moderate geological risk area that extends north, northwest, west, southeast, and south of the amended UGB for about a half to three-fourths of a mile.
- Beyond this relatively buildable band, there are:
 - High risk earthquake liquefaction hazard areas (to the north and south);
 - Severe risk earthquake shaking hazards to the south, southwest and northwest; and
 - High risk landslide areas with slopes of 25% or greater to the west.

Figure V-5 Composite Map: Landslide, Liquefaction, Subduction Shaking, and Steep Slopes



Combined Hazard Risk Summary

Figures II-4 through II-VI and Figures V-1 through V-5 show interrelationships among geological and flooding hazards. In summary:

- Although there is a correlation between slopes of 25% and greater and high landslide risk in the West Hills and therefore should be considered unbuildable – consistent with the findings of the 2020 Buildable Lands Inventory.
- Geological hazards (landslide and earthquake liquefaction / shaking) exist on slopes of 15% or less. Therefore, the composite geological maps are a better indicator than steep slopes to determine where geological studies and erosion control measures should be required.
- The composite geological and flooding maps show landslide hazards at the edge of most floodplains and the presence of high earthquake liquefaction and severe shaking hazards within all floodplain boundaries. Even relatively minor flood events can trigger bank failures in such areas. Since a major subduction

earthquake would undoubtedly trigger bank failures next to the 100-year floodplain, extending protection to adjacent landslide areas makes sense.

- The composite geological maps show an inverse relationship between earthquake risk on the one hand and landslide risk in the West Hills. Except for floodplain areas in the West Hills and Valley, earthquake liquefaction and shaking risk areas tend to end where landslide areas begin.
- Together, these high to severe geological hazards form a continuous ring located from 0.5 to 0.75 miles to the southeast, south, southwest, west, northwest and north of the amended McMinnville UGB.
- The composite wildfire, geological and flooding maps show that moderate and high wildfire hazards are associated with forested rural residential development in the West Hills. Wildfire hazard areas sometimes occur in moderate-to-steep slope hazard areas and vegetated floodplains throughout the study area.

The overlaps that exist among these types of hazards and supports the concept of a combined natural hazards overlay comprehensive plan map designation. As discussed in Section VII of this report, Winterbrook recommends the assignment of one of two natural hazard subdistricts based on combined natural hazard risk scores in specific geographic subareas. The methods for drawing subdistrict maps are discussed in Chapter VII.

VI. Natural Hazard Program Management Options

In Sections II-IV of this report, we inventoried three types of natural hazards:

- Geological Hazards (including landslides and subduction and crustal earthquakes)
- Flooding Hazards
- Wildfire Hazards

In Section V we analyzed the McMinnville NHMP and the Yamhill County CWPP and determined that substantial overlaps exist among these three general types of hazards.

In Section VI we analyze management options for each of these natural hazard categories based on:

1. Recommendations found in the draft 2020 McMinnville NHMP.
2. Management practices in six comparator cities described in Appendix 1.
3. Advanced natural hazards inventory work related to geological and wildfire hazards found in the draft McMinnville NHMP and Winterbrook’s experience in preparing comprehensive natural hazard inventories and management programs for other Oregon jurisdictions.

McMinnville NHMP Multi-Hazard Action Items

The McMinnville NHMP includes five relevant “multi-hazard” recommendations that will be followed for each of the three natural hazard categories:

Table VI.1 McMinnville NHMP Recommended Natural Hazard Mitigation Measures

| Policy Number | Policy Text | Evaluation |
|------------------|---|---|
| Multi-Hazard #2 | Incorporate mitigation planning provisions into community planning processes such as comprehensive, capital improvement, land use, transportation plans, zoning ordinances, community development practices, etc. | Section VII includes recommendations for amending the McMinnville Comprehensive Plan to include natural hazard inventory and management policies proposed to be implemented in the McMinnville Zoning Ordinance. |
| Multi-Hazard #7 | Develop and maintain GIS mapped hazard areas within the UGB. | Sections II-V include a series of geological, flooding and wildfire hazards maps within the McMinnville UGB and within potential UGB expansion areas. |
| Multi-Hazard #10 | Establish a process to coordinate with state and Federal agencies to maintain up-to-date hazard data, maps and assessments. | Section VII includes a policy to coordinate with state and federal agencies through periodic updates of the McMinnville NHMP and the Yamhill County CWPP. |

| Policy Number | Policy Text | Evaluation |
|-------------------------|---|---|
| Multi-Hazard #11 | Limit (e.g., reduced density, etc.) or prohibit development in high hazard areas. | Section VI considers options to limit development in medium and high hazard areas – and to prohibit development in some high hazard areas. Section VII includes recommendations for a consolidated Natural Hazards Overlay District that limits or prohibits development depending on the hazard level and cumulative hazard impacts. As proposed, the NHOD would be applied to land within the McMinnville study area to guide future urban growth. Application of the NHOD outside the McMinnville City Limits would require an amendment to the Urban Growth Management Agreement (UGMA) between the City and Yamhill County. |
| Multi-Hazard #12 | Encourage mitigation practices in developments at risk to natural hazards. | Section VI considers mitigation options and Section VII recommends specific mitigation measures. |

Geological Hazards

The text below considers (a) McMinnville NHMP geological hazards measures / action items and (b) geological hazards mitigation programs (comprehensive plan policies and development standards) in six comparator cities.

McMinnville NHMP – Recommended Measures

The draft McMinnville NHMP (Table MA-1 McMinnville Action Items) proposes specific mitigation measures / action items for each moderate-to-high risk geological hazards.

Table VI.2 McMinnville NHMP Recommended Geological Hazard Measures

| Policy Number | Policy Text | Evaluation |
|----------------------|--|---|
| Earthquake #5 | Educate property owners about structural and non-structural retrofitting of vulnerable buildings and encourage retrofit. | Section VII includes a policy recommendation to this effect. |
| Earthquake #6 | Develop an outreach program to educate and encourage homeowners and tenants to | Section VII includes a policy recommendation to this effect. |

| Policy Number | Policy Text | Evaluation |
|---------------------|--|--|
| | secure furnishings, storage cabinets, and utilities to prevent injuries and damage. | |
| Landslide #1 | Utilize technology, geologic resources and other available data (such as DOGAMI LIDAR data) to identify and map potential areas for landslides - high, moderate and low. | Sections I -V of this report include available GIS data sources and tools to identify and map potential landslide areas – both singularly and in combination with earthquake, wildfire and flooding hazards. |
| Landslide #2 | Develop a process to limit future development in high landslide potential areas - permitting, geotechnical review, soil stabilization techniques, etc. | Section VI considers procedural and substantive options to limit development in moderate and high hazard areas. Section VII includes recommendations for a consolidated Natural Hazards Overlay District that includes permitting, geotechnical review and stabilization measures for landslide and earthquake areas. |
| Landslide #3 | Development in steeply sloped areas (greater than 15%) should be subject to specific development requirements to control erosion. | Sections II-V identify the importance of steep slopes in determining the location of severity of landslide and wildfire hazards. Section VI considers the use of a 15% slope threshold for triggering specific erosion control requirements. Section VII includes recommendations for a consolidated Natural Hazards Overlay District that includes slope and other geological triggers for erosion control review. This overlay could be applied within the Natural Hazards Study Area to evaluate risk when considering future UGB expansion areas. |
| Landslide #4 | Complete an inventory of locations where critical facilities, other buildings and infrastructure may be subject to landslides. | Section VII includes a policy recommendation to this effect. |

Best Geological Hazard Mitigation Practices in Comparator Cities

Winterbrook has provided a detailed summary of comprehensive plan policies and mitigation practices for geological hazards (steep slopes, earthquakes, and landslides) in six comparator communities (Ashland, Grants Pass, Albany, Newberg, Redmond and Bend). **Please see Appendix 1 Best Natural Hazard Mitigation Practices in Comparator Cities.**

The cities of Albany, Ashland, Bend, Grants Pass and Newberg limit development in mapped steeply sloped areas.

- The threshold for application of hillside steep slope standards varies from 12 – 25% slope.
- Most of these cities require the implementation of recommendations from geological studies and erosion control measures prior to development.
- Some cities require reduced residential densities based on slope percentage (slope density ratio).
- Some cities allow for density transfer – often through the planned unit development process.

Table VI.3 summarizes geological hazard management practices by city.

Table VI.3 Summary of Geological Hazard Management Practices by City

| City | Percent Slope Threshold | Geotechnical Report Required? | Slope Density Ratio? | Density Transfer Allowed? | Earthquake Impacts Regulated by Zoning? | Other Standards |
|-------------|-------------------------|-------------------------------|----------------------|---------------------------|---|--------------------------------------|
| Albany | 12% | Yes | Yes | Yes | Not directly – may be addressed in geotechnical report | Yes – see below |
| Ashland | 25% | Yes | Yes | Yes | Not directly – may be addressed in required geotechnical report | Yes – see below |
| Bend | 10-20% | Maybe | No | Yes | Not directly – may be addressed if geotechnical report required | Yes – see below |
| Grants Pass | 15% | Yes | No | No | Not directly – may be addressed in required geotechnical report | Yes- see below |
| Newberg | 20% | Maybe | No | No | Not directly – may be addressed in required geotechnical report | Yes – see below |
| Redmond | N/A | Maybe | No | No | Not directly – may be addressed if geotechnical report required | Yes – see below |
| McMinnville | N/A | No | No | No | No | Yes – see Section VII of this report |

- **Albany has several measures that guide implementation of hillside development policies:**
 - Measure 6. Require proposed hillside development to provide for the preservation and, if possible, enhancement of the site’s natural features during all phases of the design and development process. This includes consideration of soils, vegetation, hydrology, wildlife habitat, views and visual orientation, both from the site and to the site, and unusual or unique natural features.
 - Measure 10. Require that all excavation and fill work and structural foundation work be approved by a registered engineer whenever the slope is greater than 30% or where there exists probability of geologic hazards such as perched water tables and/or landslide areas. Where appropriate, such approval shall include information from a soils engineer and engineering geologist.

- Measure 11. Increase minimum lot sizes (or minimum lot area per unit) on hillside areas, allowing higher densities for cluster developments approved through Planned Development as outlined in the following table:

| Slope % | Standard Dev. | (RS 6.5 Lot) | PUD Devel. | (RS 6.5 Avg) |
|----------|---------------|--------------|------------|--------------|
| 13 to 20 | 1.25 | 8125 | 1.00 | 6500 |
| 21 to 25 | 1.50 | 9750 | 1.15 | 7475 |
| 26 to 30 | 2.00 | 13000 | 1.40 | 9100 |
| 31 above | 3.00 | 19500 | 2.00 | 13000 |

Albany’s **Hillside Overlay District** applies to mapped areas of the city (primarily West Albany) with 12% or greater slope. Allowed density decreases as slope increases; however, density transfer is allowed through the PUD process when 20% of the site remains open space. Cut and fill activity should be minimized. A licensed engineer must approve excavation plans and foundation design.

- **Ashland’s Physical and Environmental Constraints Overlay Zone** (Chapter 18.62) applies to mapped “Flood Plain Corridor Land, Hillside Land (slopes \geq 25%, or Severe Constraint Land (including wildfire lands, floodways and slopes \geq 35%)).
 - *“The above classifications are cumulative in their effect and, if a parcel of land falls under two or more classifications, it shall be subject to the regulations of each classification. Those restrictions applied shall pertain only to those portions of the land being developed and not necessarily to the whole parcel.”*
 - Geotechnical engineering studies are required for development on slopes of 25% or greater.
 - Slopes \geq 35% are considered unbuildable (maximum of 1 unit per acre provided geotechnical report recommendations are followed). No new lots may be created on such slopes. Hazardous or unstable areas of the site must be avoided.
 - The maximum cut slope height is 15 feet and the maximum fill slope height is 20 feet.
 - Trees must be protected based on an arborist report and must consider fire protection plan requirements in designated wildfire areas.

On-site density transfer is allowed from non-buildable to buildable areas of the site (contiguous land under common ownership). The maximum allowable density on buildable areas of the site is twice the allowable density in the underlying zoning district.

- **Bend** maps and regulates development on “**sensitive lands**” which include both Goal 7 natural hazards and Goal 5 natural resources. Natural hazards included in the definition of “sensitive lands” include slopes of 10% or greater and land within the 100-year floodplain.
 - The Bend Comprehensive Plan includes policies to (a) coordinate with DOGAMI to identify fault lines in the community and (b) to review development “on slopes in excess of 10 percent shall give full consideration to the natural contours, drainage patterns, and vegetative features of the site to protect against temporary and long-term erosion.” However, we could find no specific development standards to implement these policies.
 - Although the Bend Development Code defines steep slopes as 10% or greater (BDC 16.05.060), the threshold for requiring grading and erosion control permits (and possibly engineering reports) is slopes of 20% or greater. As part of grading permit review, the city “may” require an

engineering or geologist report if “the City determines that special circumstances warrant such information.”

- Minimum densities are determined after excluding “sensitive lands.” (BDC 2.1.600) However, density transfer is allowed from land with slopes of 25% or greater to buildable areas on the same site if “sensitive lands” are protected by a conservation easement or dedication. There do not appear to be any restrictions on the amount of density that can be transferred.
- **Grants Pass** evaluated soil types for erosion and shrink-swell potential. The comprehensive plan identified slopes greater than 15 percent on the Slope Hazards map and found that development on slopes between 15 and 35 percent should be reviewed by a soils scientist and an engineer, while development on slopes over 35 percent should require geotechnical review.
 - The Grants Pass Slope Hazard District encompasses areas of at least 15 percent slope and contains two classes of slope: Class A (between 15 and 25 percent) and Class B (greater than 25 percent).
 - Development within the Slope Hazard District requires a Steep Slope Development Report and Grading and Erosion Plans. Class A documentation requires a licensed engineer stamp, while Class B requires a geotechnical engineer or engineering geologist stamp.
 - Restrictions on development within the Slope Hazard District include erosion control measures and retaining wall height is limited to 20 feet.
- **Newberg’s Comprehensive Plan** identifies “hazardous areas” as areas with slopes 20 percent or greater, or with geological limitations. Development may be permitted in hazardous areas if consistent with sound engineering and planning criteria.
 - Comprehensive Plan Policy 5 states that “In other areas of potential or existing hazards, development shall be subject to special conditions. Reasonable development may be permitted in these areas when it can be shown, based on sound engineering and planning criteria, that adverse impacts can be mitigated and kept to a minimum. Hazardous areas shall be considered to be lands with slopes 20% or greater, potential and existing slide areas, fault areas, and areas with severe soil limitations.”
 - **The Newberg Development Code** does not appear to have specific geological development regulations. However, sloped areas are regulated by Title 13 Public Utilities and Services, which “may require” additional erosion and sediment controls on slopes of 10 percent or more.
- **Redmond’s Comprehensive Plan** includes several policies related to natural hazards:
 - Policy 4. Natural hazards that could result from new developments, such as runoff from paving projects and soil slippage due to weak foundation soils, shall be considered, evaluated and provided for.
 - Redmond’s **Urbanization Study** indicates that “Redmond has no land that is unavailable for development due to physical constraints: steep slopes, wetlands, riparian areas, and floodplains. This is due to the city’s location and the fact that the dry canyon is mostly in public ownership.”
 - However, evaluation of hazards may be required during site and design review:

The Redmond Development Code (RDC 8.3030) states that “Special Studies, Investigations and Reports. Special studies, investigations and reports may be required to ensure that the proposed development of a particular site does not adversely affect the surrounding community, does not create hazardous

conditions for persons or improvements on the site. These may include traffic impact studies impact of contaminated soils, soil conditions, flooding of waters and excessive storm water runoff, tree preservation, and other concerns of the development’s impact on adjacent properties or public facilities.”

Flood Hazards

The text below considers (a) McMinnville MHMP flood hazard measures / action items and (b) flood hazard mitigation programs (comprehensive plan policies and development standards) in six comparator cities.

McMinnville NHMP – Recommended Flood Hazard Measures

The draft McMinnville NHMP (Table MA-1 McMinnville Action Items) proposes specific mitigation measures / action items for flood hazards.

Table VI.4 McMinnville NHMP – Evaluation of Recommended Flood Hazard Mitigation Measures

| Policy Number | Policy Text | Evaluation |
|---------------|---|---|
| Flood #1 | Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances. | The Comprehensive Plan already includes a policy to this effect. |
| Flood #2 | Work with FEMA to update FIRMs. Request DOGAMI debris flow and lidar data be included in FIRM updates. Use the updated FIRMS for land use and mitigation planning. | Section III Flood Hazard Inventory relies on existing flood hazard information. Section VII includes a policy to update the flood hazard inventory in the future based on DOGAMI debris flow and lidar data. |
| Flood #4 | Develop and maintain GIS mapped critical facility inventory for all structures and residential and commercial buildings located within 100-year and 500-year floodplains. | Section VII includes a policy recommendation to this effect. |

Best Flood Hazard Management Practices in Comparator Cities

As discussed below, the cities of Albany, Ashland, Bend, Grants Pass, Newberg and Redmond all limit development in mapped floodplain areas. **Please see Appendix 1 Best Natural Hazard Mitigation Practices in Comparator Cities** for a more detailed discussion of comprehensive plan policies and development regulations that limit development in flood hazard areas.

Table VI.5

| City | Prohibit Development in Floodway | Limit Development in Flood Plain | Density Transfer Allowed? | Erosion Control Measures? | Other Standards |
|--------------------|----------------------------------|----------------------------------|---------------------------|---------------------------|--------------------------------------|
| Albany | Yes | Yes | Yes | Yes | Yes – see below |
| Ashland | Yes | Yes | Yes | Yes | Yes – see below |
| Bend | Yes | Yes | No | Yes | Yes – see below |
| Grants Pass | Yes | Yes | No | No | Yes- see below |
| Newberg | Yes | Yes | No | No | Yes – see below |
| Redmond | Yes | Yes | No | No | Yes – see below |
| McMinnville | Yes | Yes | No | No | Yes – see Section VII of this report |

Summary of Flood Hazard Management Practices by City

The Cities of Ashland, Albany, Bend, Grants Pass, Newberg and Redmond all have standard floodplain management programs consistent with FEMA standards. Development, if allowed within the 100-year floodplain, must be constructed one foot above flood level and meet other standards.

- Ashland’s **Physical and Environmental Constraints Overlay Zone** regulates natural hazards as well as natural resources. Ashland integrates its floodplain management program with related natural resources (wetland and stream corridor) programs. In addition to designated floodplain areas, Ashland limits development in areas that have historically experienced flooding.
- Bend defines the 100-year floodplain as “**sensitive lands**” along with other natural hazards and natural resources (including wetlands and stream corridors).

Wildfire Hazards

Most comparator cities do not have reregulate wildfire hazards in their land use regulations. The text below considers (a) McMinnville NHMP wildfire hazard measures / action items and (b) wildfire hazard mitigation programs (comprehensive plan policies and development standards) in six comparator cities.

McMinnville NHMP – Recommended Measures

The draft McMinnville NHMP (Table MA-1 McMinnville Action Items) proposes specific mitigation measures / action items for wildfire hazards.

Table VI.5 McMinnville NHMP – Evaluation of Recommended Flood Hazard Mitigation Measures

| Policy Number | Policy Text | Evaluation |
|--------------------|--|--|
| Wildfire #1 | Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan. | The CWPP was last revised in 2015. The revised version was considered in this report. |
| Wildfire #3 | Develop, implement, and enforce vegetation management codes/plans to reduce wildfire risk. | Section V considers options for vegetation management measures – depending on the location of the wildfire hazard. Section VII includes recommendations for a consolidated Natural Hazards Overlay District that includes vegetation management provisions – again depending on the location of the hazard. |

Best Practices in Comparator Cities

Most comparator cities have participated in county community wildfire protection planning efforts. However, only Ashland has mapped and adopted zoning standards to protect life and property in designated wildfire hazard areas. **Please see Appendix 1 Best Natural Hazard Mitigation Practices in Comparator Cities** for a more detailed discussion of comprehensive plan policies and development regulations that limit development in wildfire hazard areas.

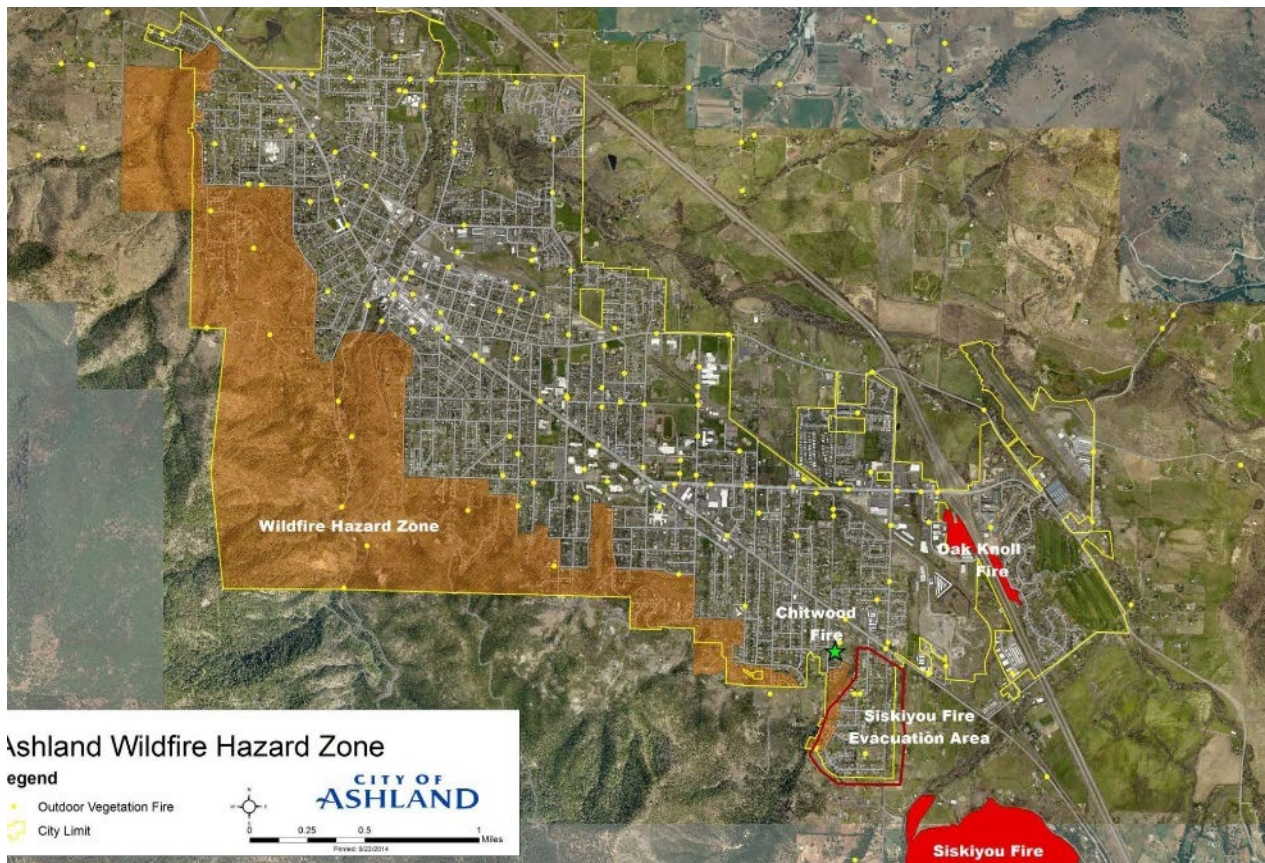
Ashland Wildfire Mitigation Program

Ashland’s standards for wildfire mitigation mirror standards required by the Goal 4 administrative rule for structures in commercial forest zones. Ashland maps urban-wildland interface areas and has adopted several policies to protect life, property, and environmental resources:

- Policy 46. Require installation and maintenance of a 40-foot fuel break around each dwelling unit or structure.
- Policy 47. Require multi-dwelling unit developments to install and maintain a perimeter fuel break to prevent fire from entering the development, or to prevent a fire spreading from the development and threatening the Ashland Watershed. (Width of break is dependent on topography, aspect, vegetation, types and steepness of slopes.)
- Policy 48. Where vegetation needs to be maintained for slope stability in a fuel break area, require plantings of fire-resistant or slow-burning plants. The City shall make a list of such plants available to the public. (See “Wildfire Hazard Management in the Urban/Wildland Interface in Southern Oregon,” by Claude Curran - May 1978.)
- Policy 49. Require more than one ingress/egress route or road widths wide enough to accommodate incoming fire apparatus and evacuating residents simultaneously in an emergency situation.
- Policy 50. Require roofs to be constructed of fire-resistant materials. Wood shake or shingle roofs are not allowed.

- Policy 51. Encourage road placement to function as fire breaks in urban/wildland interface developments.
- Policy 52. Require chimneys of wood-burning devices to be equipped with spark arrester caps and/or screens.
- Policy 53. Install all new electrical distribution circuits in the urban/wildland interface underground if technically feasible.
- Policy 54. The City shall encourage and support education/ information programs dealing with wildfire hazards in the urban/wildland interface. Information shall be made available through the City Building and Planning Departments to developers and builders wishing to build in the urban/wildland interface.

Figure VI-1 Ashland's Wildfire Hazard Overlay Zone



Ashland integrates natural resource, water quality, and hillside considerations with wildfire mitigation requirements:

- Any development or land division within these areas is required to prepare a Fire Prevention and Control Plan and establish and maintain a fuel modification area (generally crown separation, tall brush removal, tree trimming, etc.).
- "l. Where necessary for erosion control, slope stability, riparian and wetland preservation and enhancement, performing functions considered beneficial in water resource protection, or aesthetic

purposes, existing vegetation may be allowed to be retained consistent with an approved Fire Prevention and Control Plan, or upon written approval of the Staff Advisor in consultation with the Fire Code Official.

- m. Fuel modification in areas which are also classified as Hillside Lands or Water Resource Protection Zones shall be included in the erosion control measures outlined in section 18.3.10.090, Development Standards for Hillside Lands, and management plan for water resource protection zones in section 18.3.11.110.

Composite Approach – Cumulative Impacts

As discussed above, most comparator cities separately regulate flooding with geological hazards (to varying degrees).

- All flood maps and regulations are based on FEMA standards and restrict development within floodplains and floodways.
- Most cities have some variation on hillside development overlay zones triggered by minimum slopes – ranging from 10% to 20%.
- Ashland is unique among comparator cities in have a single multi-hazard overlay zone – supported by a series of hazard-specific maps – that includes development standards for geological, flooding and wildfire hazards.

VII. Natural Hazard Program Recommendations

McMinnville's Existing Natural Hazard Policy Framework

McMinnville Comprehensive Plan (2017)

Winterbrook was able to find two Comprehensive Plan policies directly related to natural hazards:

2.00 The City of McMinnville shall continue to enforce appropriate development controls on lands with identified building constraints, including, but not limited to, excessive slope, limiting soil characteristics, and natural hazards.

9.00 The City of McMinnville shall continue to designate appropriate lands within its corporate limits as "floodplain" to prevent flood induced property damages and to retain and protect natural drainage ways from encroachment by inappropriate uses.

Policy 71.07 applies the relatively low density R-1 zoning designation to steeply sloped portions of the West Hills:

71.07 The R-1 zoning designation shall be applied to limited areas within the McMinnville urban growth boundary. These include: 1. The steeply sloped portions of the West Hills.

As noted in the Introduction to this report, McMinnville recently adopted Great Neighborhood Principles that call for consideration of natural features the long-range and land use application planning processes. This report helps to implement these policies.

In addition to these general policies described above, the McMinnville Residential Land Study (ECONorthwest, 2003) excludes slopes of 25% and greater and land within the 100-year floodplain from the buildable lands inventory. It is our understanding that the City requires sprinklers for homes constructed on slopes of 15% or greater.

Otherwise, there do not appear to be any other natural hazard policies in the McMinnville Comprehensive Plan.

McMinnville NHMP Plan Direction

From the McMinnville NHMP (p. MA-13):

Incorporate mitigation planning provisions into community planning processes such as comprehensive, capital improvement, land use, transportation plans, zoning ordinances, community development practices, etc.

Rationale: Comprehensive plans provide the framework for the physical design of a community. They shape overall growth and development while addressing economic, environmental and social issues. Oregon's statewide goals are accomplished through local comprehensive plans. State Law requires local governments to adopt a comprehensive plan and the zoning and land-division ordinances needed to put the plan into action.

Integration of NHMPs into comprehensive plans and other plans will help to reduce a community's vulnerability to natural hazards, support in mitigation activities, help to

increase the speed in which action items are implemented and therefore the speed in which communities recover from natural disasters.

Integration of NHMPs into local plans gives the action items identified in the NHMP legal status for guiding local decision-making regarding land use and/or capital expenditures.

Implementation: Integrate natural hazards information and policies into the comprehensive plan and other plans.

Engage in collaborative planning and integration.

Coordinate future NHMP and comprehensive plan reviews and updates.

Proposed Natural Hazards Comprehensive Plan Amendments

The proposed Comprehensive Plan amendment package would include:

- Natural Hazard Inventory Maps and Descriptions (Sections II-V of this report).
- Natural Hazard Management Policy Framework (a new Chapter XI: Natural Features)
- Natural Hazard Overlay shown on the Comprehensive Plan Map (shown on Figure VII-1)

Proposed McMinnville Zoning Ordinance Amendments

Proposed natural hazards policies call for the adoption of two natural hazards subdistricts (that would overlay the underlying base zones (Residential, Commercial, Industrial, Floodplain and Agricultural Holding). The proposed natural hazards subdistricts are based on a ranking system and policy framework set forth below and would include hazard-specific protection and mitigation standards. The two proposed subdistricts are shown on Map VII-1 and could be referenced in a new Chapter 17.50 Natural Hazard Subdistricts:

- The Natural Hazards Mitigation (NH-M) Subdistrict
- The Natural Hazards Protection (NH-P) Subdistrict

Natural Hazards Inventory

The Natural Hazards Inventory (including text and embedded maps) is included in Sections I-V and VII of this report. Copies of 11" X 17" GIS Inventory maps are provided separately.

Natural Hazards Composite Ranking System

The proposed Natural Hazard composite ranking system is based on two scored variables: the probability of a natural hazard event occurring at a specific location within the 2021 UGB and the vulnerability assessment of the natural hazard event happening. The probability variable is determined by combining the natural hazard inventory maps into a single overlay that describes the combined probability for individual "subareas" (GIS polygons). The vulnerability variable is informed by the 2020 *Oregon Natural Hazards Mitigation Plan* (Oregon NHMP). The terms "subarea" and "polygon" are used interchangeably to describe the composite ranking system. Appendix 2 contains a detailed methodology of the steps used to create the Natural Hazard Overlays.

Natural Hazard Probability

A combined natural hazard probability can be created by assigning a consistent number scoring system and by using a series of GIS manipulations. The number scoring system used in the rank of the probability score is displayed in Table VII.1. The scores were determined in coordination with McMinnville Associate Planner Jamie

Fleckenstein, and they are consistent with the ranking scale used in the Oregon NHMP. The scale runs from 0 to 5, with 0 being no or low probability of the natural hazard event happening at that spatial location and 5 being a high or severe probability of the natural hazard event happening.

- **Natural Hazard Type** shows the types of natural hazards that may be present in any given subarea.
- **Hazard Probability** shows the hazard levels that may be present for each hazard probability in any given subarea.
- **Hazard Probability Score** shows the hazard score for each type and level of hazard probability that may be present in any given subarea.

Table VII.1 Natural Hazard Risk Assessment (2021)

| Natural Hazard Type | Hazard Risk Level | Individual Hazard Score | |
|-------------------------------------|-------------------|-------------------------|---|
| Landslide | Moderate | 2 | |
| | High | 5 | |
| Cascadia Subduction Zone Earthquake | Liquefaction | Moderate | 2 |
| | | High | 5 |
| | Shaking | Very Strong | 2 |
| | | Severe | 5 |
| Slope | 25% | 5 | |
| Flood | Floodplain | 5 | |
| Wildfire | Moderate | 2 | |
| | High/Severe | 5 | |

Natural Hazard Vulnerability – Oregon Natural Hazards Mitigation Plan

The Oregon NHMP was completed in the Fall of 2020. To remain consistent with the State’s assessment, the plan was considered and incorporated as part of the natural hazard composite ranking system. The Oregon NHMP presents a series of natural hazard risk assessments for all Oregon counties. For simplification at the state level, these risk assessments were calculated county wide. The Oregon NHMP is broadly based on three variables:

1. The probability of the event happening.
2. The physical vulnerability of the event happening, and
3. The social vulnerability of the event happening.

These variables are summarized for Yamhill County in Table V11.2.

Table VII.2 Oregon NHMP Risk Assessment for Yamhill County

| Hazards for Yamhill County | Probability | Physical Vulnerability | | | | Social Vulnerability | Vulnerability (Social + Physical) | | Risk (Prob. + Physical Social) | |
|----------------------------|-------------|------------------------|---------------------------|---------------------------|---------------------------|----------------------|-----------------------------------|---------------|--------------------------------|-------------|
| | | State Buildings | State Critical Facilities | Local Critical Facilities | Total Combined & Rescaled | | Total Combined & Rescaled | Vulnerability | Total Combined & Rescaled | Risk |
| Earthquake | 4 | 3 | 3 | 2 | 2.67 | 4 | 3.33 | Very High | 3.56 | Very High |
| Flood | 4 | 1 | 1 | 2 | 1.33 | 4 | 2.67 | Moderate | 3.11 | High |
| Landslide | 5 | 1 | 1 | 2 | 1.33 | 4 | 2.67 | Moderate | 3.44 | Very High |
| Volcanic | 1.5 | 1 | 1 | 1 | 1 | 4 | 2.5 | Moderate | 2.17 | Low |
| Wildfire Hazard | 2 | 1 | 1 | 1 | 1 | 4 | 2.5 | Moderate | 2.33 | Moderate |
| County Total | | | | | | | | | 2.92 | High |

Physical vulnerabilities were determined by assessing the concentration of state-owned or leased facilities and local critical facilities. Social vulnerabilities were based on Centers for Disease Control and Prevention (CDC) social vulnerability index. The Oregon NHMP uses 2016 data and aggregates at the County level, normalizing it with other Oregon Counties, grouping counties into quintiles, and then included state determined “sensitivity” and “adaptive capacity” rankings.

Because the state assessment is county wide, the probability of the natural hazard event occurring is based on the county-wide probability, regardless of spatial sensitivity to the event within the county. For example, wildfire hazards that are more probable in the west hills would be assigned the same probability in that location as if they were to occur in the City center or suburban areas. Since more detailed spatial probability of a natural hazard event occur is available – as detailed in the inventory maps of this report – the composite mapping relies only on the combined physical and social vulnerabilities determined by the Oregon NHMP. The probabilities of the natural hazard event occurring are replaced with the more spatially sensitive information contained in the inventories. The vulnerability index was only applied to a subarea when there was a moderate or high/severe probability of that natural hazard event occurring.

Combined (Cumulative) Ranking Applied Individually to Hazard Subareas

Using GIS, Winterbrook assigned a combined natural hazard risk score based on both the probability of the event happening and the state determined vulnerability of the event happening. This score was calculated for each spatial subarea (polygon) within the 2021 McMinnville UGB. Total probabilities and vulnerabilities were summed and averaged to produce a total risk score on a scale from 0 to 5, where 0 is low to no risk of the natural hazard event and 5 is high/severe risks of multiple hazard events. Each polygon now has 10 contributing variables. The combined natural hazard risk is detailed in Table V11.3.

Table VII.3 Combined Natural Hazard Risk by Natural Hazard Type in McMinnville

| Natural Hazard Type | Probability of the Hazard in McMinnville | | Social + Physical Vulnerability |
|-------------------------------------|--|---|---------------------------------|
| Landslide | Moderate | 2 | 2.67 |
| | High | 5 | 2.67 |
| Cascadia Subduction Zone Earthquake | | | (Earthquake) 3.33 |
| Liquefaction | Moderate | 2 | |
| | High | 5 | |
| Shaking | Very Strong | 2 | - |
| | Severe | 5 | |
| Slope | ≥25% | 5 | - |
| Wildfire | Moderate | 2 | 2.50 |
| | High/Severe | 5 | |
| Flood | Floodplain | 5 | 2.67 |
| | Floodway | 5 | |

For discussion purposes, the McMinnville study area can be divided into two generalized areas in relation to hazard characteristics: low-lying (Valley) areas and higher-elevation areas (West Hills). Characteristics of Valley and West Hills areas in relation to combined hazard scores are summarized below. Note that the entire McMinnville 2021 UGB has a “very strong” probability of shaking. This hazard is included in the combined natural hazard risk calculations for consistency but does not affect subdistrict determination. Because of this, policies are recommended to address “very strong” shaking risks.

Valley Area Hazard Characteristics

The Cascadia Subduction Earthquake and flooding pose the greatest long-term threats to life and property in low-lying areas. Moderate earthquake liquefaction risk and “very strong” shaking hazards are present on most land within the UGB. These areas overlap with the 100-year flood plain and would trigger river and stream bank failures in the event of a major earthquake.

Valley area hazard scores have several inter-related characteristics:

- Due to the presence of moderate earthquake liquefaction and shaking hazards in most UGB subareas, the highest combined hazard risk score *outside* the 100-year floodplain is 2.75.
- Because floodplain polygons (score of 5) also have moderate earthquake liquefaction and very strong shaking hazards, the combined hazard score for most floodplain subareas is 3.571. Floodplain polygons are also likely to have also has moderate to severe wildfire risk (due to riparian vegetation) and moderate to high landslide risks (bank failure).
- Steep slopes in the valley are also more likely to correlate with floodplain and floodway areas. When outside of the floodplain and floodways, steep slopes occur with moderate to high landslide risks in most areas.

West Hills Area Hazard Characteristics

In the West Hills, landslide, steep slope, and wildfire hazards are common and often overlap. Earthquake liquefaction and shaking risk areas may also be located within the floodplains of Cozine and Baker Creeks.

- Subareas with moderate to severe wildfire risks have a combined score between 0.983 and 2.55. These wildfire risk areas often have moderate to high landslide risks.
- Subareas with steep slopes always overlap with moderate to high landslide risk areas.
- Some moderate liquefaction areas are present along the tributaries of Cozine and Baker Creeks.

Natural Hazards – Combined Risk Categories and Related NH Subdistricts Map

There are three broad categories of natural hazards in the McMinnville 2021 UGB. These categories relate to proposed Natural Hazards Subdistricts (NH-M and NH-P) and are based on the subarea combined hazard risk score (probabilities and vulnerabilities). Table VII.4 summarizes how Winterbrook applied the cumulative hazard score for each of the 87 subareas in the Natural Hazards Study Area to determine the level of natural hazard protection.

Table VII.4 Designation of NH Subdistricts Based on Ranking of Natural Hazards Subareas

| Combined Subarea Hazard Risk | Natural Hazard Overlay Subdistrict |
|------------------------------|--|
| 0 to 0.99 | No NH-Subdistrict |
| 1 to 1.499 | Natural Hazard Mitigation Subdistrict (NH-M) |
| 1.5 to 3.517 | Natural Hazard Protection Subdistrict (NH-P) |

- **Subareas that have one or more high risk hazards areas with a combined hazard risk of 1.5 or more would be subject to the proposed Natural Hazard Protection (NH-P) Subdistrict.** The NH-P prohibits most types of development; however, uses such as public utilities and resource enhancement are subject to hazard-specific development standards as well as building and fire codes. This category includes land within (a) floodplains and adjacent landslide and wildfire risk areas, and (b) some West Hills subareas with a combination of steep slopes, high landslide risk and moderate to high wildfire risk.
- **Subareas that have one or more moderate-to-high hazard risks with a combined hazard risk between 1 and 1.499 would be subject to the proposed Natural Hazards Mitigation (NH-M) Subdistrict.** Uses allowed by the underlying zoning district are allowed in the NH-M Subdistrict and are subject to hazard-specific development standards as well as building and fire codes. Much of the land within the West Hills falls within this category. Additional areas along creek tributaries, but outside of the floodplain, are included in this subdistrict. A larger mitigation area in the northeast is associated with dense tree groves and therefore severe wildfire hazards.
- **Subareas that are subject to moderate liquefaction or moderate wildfires only have a combined hazard risk of less than 1 and would not be subject to zoning regulation – but are subject to seismic building codes, fire codes and construction standards.** Most of the land within the UGB falls into this category.

Figure VII-1 shows the proposed Natural Hazards Overlay with Natural Hazards Mitigation (NH-M) and Protection (NH-P) Subdistricts that are derived from GIS data and based on Tables VII.1 and VII.2.

- The Natural Hazards Overlay would be shown on the comprehensive plan map.
- The subdistricts would be included in the McMinnville Zoning Ordinance and shown on the McMinnville Zoning Map.

As discussed in the Chapter XI Natural Features policy framework below, the McMinnville Urban Growth Management Agreement with Yamhill County could also be amended to apply Chapter XI policies and natural hazards overlay maps and regulations within the Natural Hazards Study Areas.

Figure VII-1 Proposed McMinnville Natural Hazards Overlay – Study Area

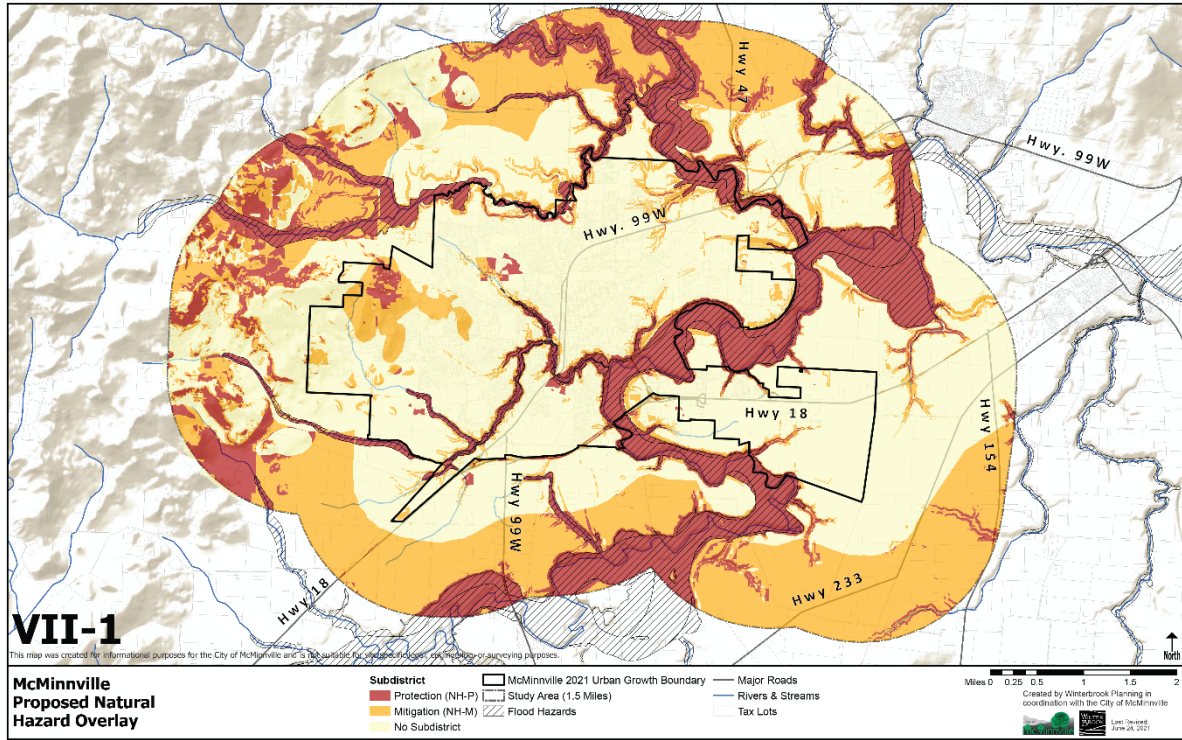
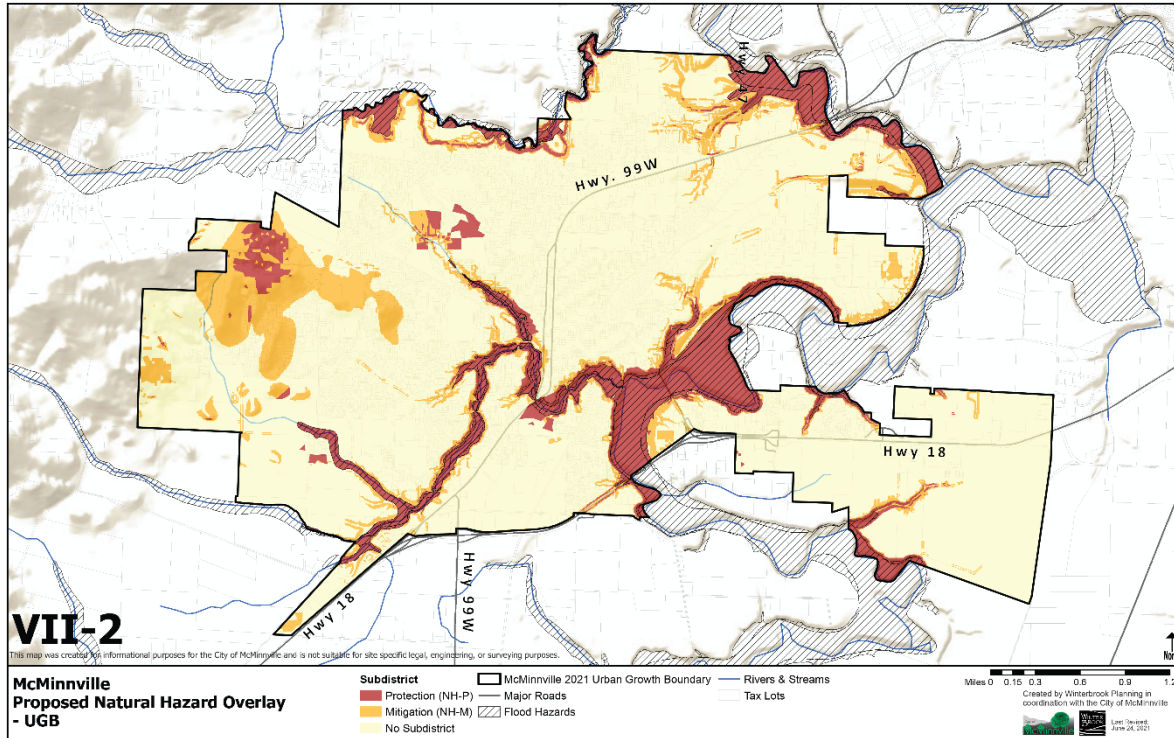


Figure VII-2 Proposed McMinnville Natural Hazards Overlay – 2021 Urban Growth Boundary



Recommended Natural Hazards Policy Framework

Winterbrook recommends that the following policy framework be added to the McMinnville Comprehensive Plan as a new Chapter XI: Natural Features.

Multi-Hazard Policies

Policy 197.00 The City of McMinnville shall adopt and maintain a Natural Hazards Inventory as part of the McMinnville Comprehensive Plan (Volume I). The inventory shall include maps and text that identify the location, type and risk level for three types of natural hazards: geological hazards (including steep slopes, earthquakes and landslides), flood hazards (land within the 100-year floodplain) and wildfire hazards within the study area (the UGB and the unincorporated outside the UGB).

Policy 197.00.010 The City of McMinnville shall apply public works construction standards, seismic building codes and fire and life safety codes wherever natural hazards are identified in the Natural Hazards Inventor – including limited, moderate and high combined risk subareas described in Table VII.1 of the Natural Hazards Inventory.

Policy 197.00.020 The City of McMinnville shall establish a **Natural Hazards (NH)** overlay zone to manage the cumulative effects of inventoried natural hazards in “moderate and high combined risk subareas” as described in Tables VII.1 and VII.2 of the Natural Hazards Inventory.

Policy 197.00.030 As shown on Figure VI-2, the NH overlay zone shall include two subdistricts based on cumulative ranking criteria found in Tables VII.1 and VII.2 of the Natural Hazards Inventory:

1. **The Natural Hazards Mitigation Subdistrict (NH-M).** The NH-M is intended to mitigate hazard impacts based on objective development standards for each applicable hazard type and the recommendations of required site-specific hazard studies.
2. **The Natural Hazards Protection Subdistrict (NH-P).** The NH-P Subdistrict is intended to prohibit most types of development and may allow for residential density transfer. Where development is allowed it shall be subject to objective development standards for each applicable hazard type and the recommendations of required site-specific hazard studies.

Policy 197.00.040 The NH-M and NH-P Subdistricts shall include objective development standards for each type of natural hazard identified the Natural Hazards Inventory, including landslide, earthquake (liquefaction and shaking), floodplains and wildfire hazards. Floodplains shall be protected by the underlying F-P Flood Hazard zone and the NH-P Subdistrict.

1. Specific information regarding the location and severity for each type of hazard in each subdistrict are available in 11" X 17" format and in the City's GIS data base.
2. In cases where hazard-specific development standards overlap, the more restrictive standard shall apply.

Policy 197.00.060 Based on objective development standards and required hazard studies, the City of McMinnville may impose conditions of land use approval to protect life and property and mitigate natural hazard impacts in natural hazard subareas. Such conditions may include, but are not limited to, conservation easements or dedication of hazard areas to the City.

Policy 197.00.060 Land division applications shall not result in a lot that lacks sufficient buildable area to meet the minimum lot size and development standards applicable in the underlying zoning district.

Policy 197.00.070 New residential, commercial and industrial construction shall be prohibited within the NH-P Subdistrict with the following exceptions:

1. Public facilities and environmental restoration projects may be permitted under objective development standards.
2. Agricultural and forest uses are permitted within the NH-P Subdistrict in areas zoned for exclusive farm and commercial forest use.
3. Residential density transfer from land within the NH-P Subdistrict to contiguous property under the same ownership that is outside both the NH-M and NH-P Subdistricts may be allowed. The maximum density allowed in the transfer area shall be the maximum density allowed in the next higher residential zoning district. For example, density transfer from the NH-P land with an underlying R1 zone to land outside the Natural Hazards Overlay (NH-P and NH-M) shall be capped at the density allowed in the R2 zone.
4. In situations where density transfer is not feasible, one dwelling unit may be allowed on a vacant residential tract under common ownership that is outside the 100-year floodplain *if* consistent with the recommendations of a geotechnical engineering study and any conditions required by the review authority.

Policy 197.00.080 In cases where application of NH-P provisions would prohibit all reasonable economic use of an existing tract of land under common ownership, the City may grant an exception to allow a use permitted in

the underlying zoning district that is not permitted in the NH-P Subdistrict. In making this decision, the applicant and City must:

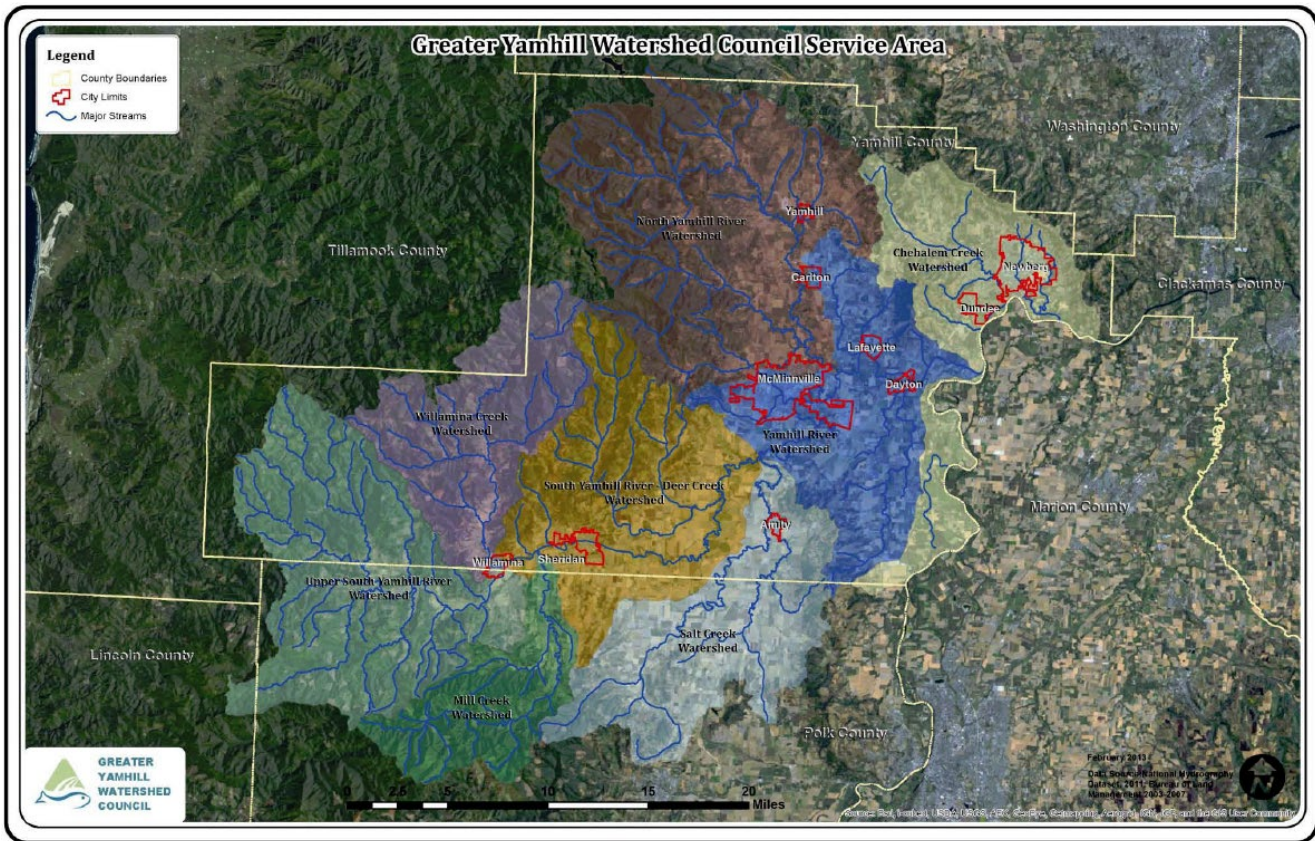
1. Consider first whether the exception provisions of Policy 197.00.070 would relieve the hardship;
2. Consider potential uses that are allowed in the NH-P Subdistrict that could provide reasonable economic value;
3. Consider alternative development layouts and land use intensity that minimize impacts from natural hazards on people and property and other values associated with natural hazard areas;
4. Limit the intensity of the allowed land use to the minimum necessary to retain reasonable economic value of the subject tract; and
5. Meet all applicable development standards that apply to natural hazards in the NH-P zone.

Policy 197.00.090 The City of McMinnville shall coordinate with Yamhill County to apply McMinnville Comprehensive Plan Chapter XI Natural Features Policies to unincorporated land within the Natural Hazards Study Area, including the application of the NH overlay zone (the NH-M and NH-S subdistricts) and related development standards. In cases of conflict with state law governing farm and forest land, state law will prevail over the NH overlay zone standards. For example, agricultural and forest uses allowed in Agricultural and Forest zones shall continue to be allowed; and the more restrictive fire mitigation standards in the County's forest zones will prevail over the less restrictive City fire mitigation standards.

Policy 197.00.100 The City of McMinnville shall coordinate with the Oregon Department of Geology and Mineral Industries (DOGAMI), the Department of Land Conservation and Development (DLCD), the McMinnville Fire Department, and Yamhill County in updates of the Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan, the McMinnville Addendum to County NHMP, and the Yamhill County Community Wildfire Protection Plan. Updates to these plans will be considered in future updates to Chapter XI of the McMinnville Comprehensive Plan.

Policy 197.00.110 The City of McMinnville shall coordinate with the Greater Yamhill Watershed Council to facilitate watershed restoration and improvement projects in natural hazard areas such as floodplains and slide hazard areas. Shared natural hazard mitigation goals include: (1) removal of invasive vegetation species (that that increase fuel for wildfires and clog waterways) and replacement with native species that reduce erosion, are more fire resistant and are less likely to clog waterways; and (2) restoration and enhancement of wetlands that provide flood control.

Figure VII-3 Greater Yamhill Watershed Council Service Area



Policy 197.00.120 New development applications shall include a Tree Removal and Mitigation Plan within the NH-M and NH-P Subdistricts. To minimize erosion and landslide potential and to maintain water quality, removal of more than three trees over 6 inches dbh¹⁰ in a calendar year shall require a Tree Removal and Mitigation Plan prepared by a certified arborist. The plan shall ensure replacement of lost trees with fire resistant native trees and vegetation. The following exceptions to this policy shall apply where:

- 1 Tree removal is permitted in the underlying Yamhill County farm or forest zone.
- 2 The proposal is part of a watershed restoration or enhancement project sponsored by a relevant Watershed Council that meets applicable City development standards.
- 3 The proposal is part of a fire protection program approved by the City of McMinnville Fire Department or RFPD. (See Wildfire Hazard Policies below.)
- 4 The proposal is necessary to meet fuel reduction standards in wildfire hazard areas pursuant to Wildfire Policies 200.050.00 and 200.060.00.

¹⁰ Diameter at breast height – or 4'6" above ground.

Geological Hazard Policies

Policy 198.00 Geological hazards appear on the McMinnville Natural Hazards Inventory and include: (1) Slopes of 25% or more; (2) Moderate, high and severe risk earthquake (liquefaction and shaking) risk areas; and (3) Moderate and high-risk landslide hazard areas.

Policy 198.10 The NH-P and NH-M Subdistricts shall apply to subareas with geological hazards as shown on Map VII-2 of the Natural Hazards Inventory. Specific geological hazards found in each subdistrict are available in 11" X 17" format and in the City's GIS data base.

Policy 198.20 Residential and commercial construction in areas with moderate or high geological risk hazards – as indicated on the Natural Hazards Inventory – shall meet the seismic and slope stability provisions of the Oregon State Building Codes. The Building Official may require a geotechnical engineering study prior to approval of construction.

Policy 198.30 The City of McMinnville shall require erosion control measures prior to grading or construction in subareas with:

1. Slopes of 15% or greater, and
2. Landslide hazards in the NH-M and NH-P Subdistricts.

Policy 198.040.00 The City of McMinnville shall require geological reconnaissance studies with the submission of land development applications where geological hazards are present within the NH-M and NH-P Subdistricts. The recommendations of the geological reconnaissance study shall become conditions of land use approval unless specifically exempted or modified by the review authority.

Policy 198.50 Where recommended in a required geological reconnaissance study – or where determined necessary by the City Engineer or Building Official in moderate risk landslide hazard areas that are not included in the NH-M Subdistrict – a geotechnical engineering study may be required prior to grading, land development or construction.

Policy 198.60 The City of McMinnville shall retain the services of a qualified geologist or geological engineer to review geological studies prepared for land use applicants.

1. The City Engineer shall determine whether a second professional opinion is required.
2. The costs of peer review shall be borne by the applicant.

Policy 198.70 The City shall consider adopting standards for public street and utility construction to moderate or higher geological hazard areas.

Policy 198.80 Because trees contribute to slope stability and reduce erosion, tree removal shall be limited in the NH-M and NH-P Subdistricts pursuant to Policy 197.120.00.

Flood Hazard Policies

Policy 199.00 Flood hazards areas are located within the designated 100-year floodplain. The City of McMinnville will continue to prohibit most types of development within the 100-year floodplain consistent with the City's F-P Flood Hazard Zone.

Policy 199.10 Natural geological and wildfire hazards associated with the 100-year floodplain, including but not limited to overlapping landslide areas, will be addressed in NH-P Subdistrict development standards. Overlapping wildfire and geological hazards found in NH-P Subdistrict that overlay the F-P Flood Hazard Zone are available in 11" X 17" format and in the City's GIS data base.

Policy 199.20 The City of McMinnville is committed to continued participation in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management regulations.

Policy 199.30 The City of McMinnville will work with the Federal Emergency Management Agency (FEMA) to update Flood Insurance Rate Maps (FIRM). The City will request Oregon Department of Geology and Mineral Industries (DOGAMI) debris flow and lidar data be included in FIRM updates.

Policy 199.40 The City of McMinnville will develop and maintain GIS maps of critical facilities identified in the McMinnville NHMP for all structures and residential development and commercial buildings within the 100-year and 500-year floodplains.

Policy 199.50 Because wetlands serve an important flood control function, wetland fill and removal shall not be permitted within the 100-year floodplain unless there is no reasonable alternative for a planned public works project.

Policy 199.60 The City of McMinnville will coordinate with the Greater Yamhill Watershed Council (or its affiliates) regarding stream and river restoration and enhancements projects to restore native vegetation, improve bank stability and improve water quality.

Policy 199.70 Because trees and vegetation reduce streambank failure and improve water quality, tree removal shall be limited in the NH-M and NH-P Subdistricts pursuant to Policy 197.120.00.

Wildfire Hazard Policies

Policy 200.00 Moderate, high, and severe wildfire hazard areas appear on the Natural Hazards Inventory and are generally associated with the West Hills and vegetated floodplains.

1. Where wildfire hazards subareas overlap with geological or floodplain hazards, they may be subject to NH-P or NH-M Subdistrict requirements, consistent with the ranking criteria found in the Natural Hazards Inventory and as shown on Natural Hazards Inventory Map VII-1.
2. Existing fire standards in Yamhill County forest zones shall continue to apply.

Policy 200.10 City staff shall coordinate with the McMinnville Fire Department and RFPD to encourage fire safety planning and education – especially in Wildfire Urban Interface zones and designated Fire Reduction Areas in the West Hills. The City of McMinnville shall continue to coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.

Policy 200.20 Residential, commercial and industrial development shall not be permitted in wildfire risk subareas in the NH-P Subdistrict; However, exceptions may be permitted pursuant to Natural Hazard Policies 197.070.00 and 197.080.00.

Policy 200.30 Development density in wildfire risk areas in the NH-M Subdistrict may be limited where necessary to provide adequate space for fuel breaks in areas that are threatened by two or more natural hazards.

Policy 200.40 In the NH-P and NH-M Subdistricts with identified wildfire hazards, applicants for land divisions and new development (excluding home remodels or additions) shall prepare a Fire Prevention and Control Plan in coordination with the McMinnville Fire Department or RFPD. The plan shall be prepared by a certified arborist and shall consider necessary tree and vegetation removal, erosion control and replacement of lost trees and vegetation with native, fire-resistant trees and vegetation.

Policy 200.50 Based on the Fire Prevention and Control Plan, the following wildfire mitigation standards shall be met:

1. Installation and maintenance of at least a 40-foot fuel break around each new dwelling or structure.
2. Where vegetation needs to be maintained for slope stability in a fuel break area, require plantings of fire-resistant or slow-burning plants. The City shall make a list of such plants available to the public.
3. Provision of one or more than one ingress/egress route or road widths wide enough to accommodate incoming fire apparatus and evacuating residents simultaneously in an emergency situation.
4. Roofs and siding with fire-resistant materials. Wood shake or shingle roofs are not allowed.
5. Design road placement to function as fire breaks in urban wildland interface developments.
6. Chimneys of wood-burning devices to be equipped with spark arrester caps and/or screens.
7. Underground electrical distribution circuits if technically feasible.
8. Sprinkler systems in all dwelling units and occupied buildings.

Appendix 1

Best Natural Hazards Management Practices in Comparator Cities

Appendix 1 _____ 1

Best Natural Hazards Management Practices in Comparator Cities _____ 1

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Albany _____ 2

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Introduction

The City of McMinnville has contracted with Winterbrook Planning to prepare a natural hazards inventory and related management program options consistent with Statewide Planning Goal 7 (Natural Hazards). The inventory and management program focuses on four natural hazards that are mapped in the McMinnville Addendum to the Yamhill County Natural Hazards Mitigation Plan:

- flooding,
- landslides,
- earthquakes, and
- wildfires.

McMinnville has identified a list of comparator Oregon cities: Albany, Ashland, Bend, Grants Pass, Newberg and Redmond.

As part of the Goal 7 Natural Hazards Program work scope, this memorandum reviews and summarizes comprehensive plan policies and land use regulations related to the identified Goal 7 natural hazards from the six comparator cities. Each city begins with a review of comprehensive plan policies, followed by a review of development code regulations.

The policy and code analysis and references are intended to summarize and inform for the purpose of high-level comparison of the comparator cities to each other and McMinnville, to the extent practicable within the project scope. This document is not, and is not intended to be, an exhaustive review of every aspect of each city's comprehensive plan, development code, building code, and local interpretation in relation to natural hazards.

Albany

Comprehensive Plan Policies and Measures

Albany's Comprehensive Plan, last amended in 2017, contains policies and measures related to the following hazards:

- Floodplain
- Slope (Hillside Development)

Comprehensive Plan Chapter 2: Special Areas contains Albany's Goal 7 policies. Albany's latest Plan update to Goal 7 policies, objectives or maps was adopted in 2010.

Wildfire hazards are not addressed. Geologic hazards beyond hillside development are not addressed.

Floodplain Policies and Measures

Albany's floodplain policies are aimed at consistency with federal (FEMA, NFIP) regulations. Development is restricted to a few specific uses (not including residential) within floodways, and requires a floodplain development permit for development within the Special Flood Hazard Area outside of the floodway (100-year floodplain) . Albany provides several floodplain-related policies:

- Policy 1. Continue to participate in the National Flood Insurance Program and comply with applicable standards.

- Policy 2. Review any development that could potentially affect the floodway or increase the area subject to the Special Flood Hazard Area (100-year floodplain), unless otherwise exempted. [Ord. 5746, 9/29/2010]
- Policy 3. Restrict new development (including fencing, grading, fill, excavation, and paving) from locating within floodways that would result in an increase in base-year flood levels. If it can be determined that there will be no increase in base-year flood levels, then the following uses may be considered: [Ord. 5746, 9/29/2010]
 - a. Public and private parks and recreational uses.
 - b. Other uses which would not involve the construction of permanent or habitable structures.
 - c. Water-dependent structures such as docks, piers, bridges, and floating marinas.
- Policy 4. Concurrent with new development, and when appropriate, secure dedications and easements adequate for channel maintenance and conveyance of storm water along natural drainageways and where identified on adopted master plans, secure easements for public open space, and future recreation use along all floodways and natural permanent drainageways.
- Policy 5. Recognize that development within areas subject to flooding is subject to regulations to protect life and property and that certain types of development may not be allowed.
- Policy 6. Ensure that development proposals in the flood fringe and adjacent to drainageways are consistent with Federal Emergency Management Agency (FEMA) and other applicable local regulations in order to minimize potential flood damage. Development proposals in areas subject to flooding may be reviewed according to the following criteria:
 - a. Proposed development activities shall not change the flow of surface water during flooding so as to endanger property in the area. Special engineering reports on the changes in water flow and potential damage which may be caused as a result of proposed activities may be required. If necessary, local drainage shall be improved to control increased runoff that might increase the danger of flooding to other property.
 - b. Impacts on significant fish and wildlife habitat have been considered and appropriate protection measures included in project design.
 - c. Problems of ponding, poor drainage, high water table, soil instability, or exposure to other flood hazards have been identified and mitigated. Evaluations and mitigating measures shall be based on a base year flood and wet season characteristics.
 - d. If adjacent to a designated floodway, the development shall be designed to use the natural amenities of the floodway including open space, scenic views and vegetation in accordance with an approved site plan.
- Policy 7. Locate and construct all public utilities and facilities such as sewer, gas, electrical, and water systems to minimize or eliminate flood damage. Require that new or replacement water supply systems and/or sanitary sewer systems be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters, and require on-site waste disposal systems to be located to avoid impairment of them or contamination from them during flooding.
- Policy 8. Locate and construct critical facilities to minimize or eliminate flood damage and to facilitate emergency operations. Critical facilities include, but are not limited to schools, nursing homes, hospitals, police, fire and other emergency responders, and installations that produce, use or store hazardous materials. Construction of new critical facilities shall be permissible within the SFHA if no feasible alternative site is available. New critical facilities must be

floodproofed to ensure that toxic substances will not be displaced by or released into floodwaters. Access routes elevated to or above the level of the base flood elevation shall be provided to all critical facilities to the extent possible. [Ord. 5746, 9/29/2010]

- Policy 9. Ensure that any filling or construction within the floodplain meets the following criteria:
- Require that a floodplain development permit is issued prior to any grading, fill, excavation, or paving activity, unless otherwise exempted, and that all grading, fill, excavation, or paving is engineered and compacted to applicable standards. Grading, fill, excavation, or paving areas for dwellings shall have engineering certification that loading rates are adequate for dwellings. [Ord. 5042, 4/14/1993; Ord. 5746, 9/29/2010]
 - b. The lowest finished floor elevation shall be built at least one (1) foot above the base-year flood level. Special engineering reports or structural work may be required.
 - c. Require property owners or developers to file a elevation certification approved by the local community permit official, registered professional engineer, architect, or surveyor indicating elevation of the surrounding grade or lowest habitable floor (including basement) of all new residential structures. This information shall be maintained to indicate compliance with Federal Emergency Management Agency (FEMA) regulations.
- Policy 10. For construction, remodeling, or major repairs to structures (including prefabricated and mobile homes) within the floodplain, review building permits to ensure that:
 - a. Building location and grading are designed to protect the structure during a base year flood.
 - b. Construction materials and utility equipment are resistant to flood damage.
 - c. Construction methods and practices will minimize flood damage.
 - d. Where appropriate, structures are designed or modified to prevent flotation, collapse, or lateral movement of the structure.
- Policy 11. Development approval within the flood fringe shall be reviewed to protect property and public safety and significant natural values.
- Policy 12. The City may provide density bonuses which encourage the protection and preservation of flood fringe areas.
- Policy 16. Encourage open space alternatives to urban level development in areas subject to flooding such as park and recreation areas, agriculture, natural areas and wildlife habitat.

Albany's comprehensive plan measures do not add notable substance to floodplain policies.

Hillside Development Policies and Measures

Albany's hillside development policies apply to slopes over 12% and provide for density reduction and cluster development in steep slope areas:

- Policy 13. Prior to annexation of hillside areas, adopt hillside development regulations for slope areas in excess of 12% in order to protect against geologic mass movement, excessive erosion and storm water runoff, and protection of important natural vegetation.
- Policy 14. Require land divisions and planned developments in slope areas to: [Ord 5042, 4/14/1993]
 - a. Minimize cut and fill requirements.
 - b. Ensure that the location and design of streets, structures, and other development give full consideration to natural contours, drainage patterns, and vegetation features of the site.
 - c. Protect against temporary and long-term erosion.

d. Control storm drainage to minimize the amount and rate of storm water flowing onto adjacent property and city streets.

- Policy 15. The City may reduce standard densities (increases in minimum lot sizes and lot area per unit) and alternatively encourage cluster development through the PUD process, with greater slopes receiving the greater density reduction and cluster development incentive.

Albany has several measures that guide implementation of hillside development policies:

- Measure 6. Require proposed hillside development to provide for the preservation and, if possible, enhancement of the site’s natural features during all phases of the design and development process. This includes consideration of soils, vegetation, hydrology, wildlife habitat, views and visual orientation, both from the site and to the site, and unusual or unique natural features.
- Measure 10. Require that all excavation and fill work and structural foundation work be approved by a registered engineer whenever the slope is greater than 30% or where there exists probability of geologic hazards such as perched water tables and/or landslide areas. Where appropriate, such approval shall include information from a soils engineer and engineering geologist.
- Measure 11. Increase minimum lot sizes (or minimum lot area per unit) on hillside areas, allowing higher densities for cluster developments approved through Planned Development as outlined in the following table:

| Slope % | Standard Dev. | (RS 6.5 Lot) | PUD Devel. | (RS 6.5 Avg) |
|------------|---------------|--------------|------------|--------------|
| 13 to 20 | 1.25 | 8125 | 1.00 | 6500 |
| 21 to 25 | 1.50 | 9750 | 1.15 | 7475 |
| 26 to 30 | 2.00 | 13000 | 1.40 | 9100 |
| 31 & above | 3.00 | 19500 | 2.00 | 13000 |

Goal 7 Land Use Regulations

Albany’s Development Code, Article 6 Natural Resource Districts, regulates development within the Floodplain Overlay District and Hillside Development Overlay District. Cluster Development regulations found in Article 11 allow on-site density transfer from natural resource districts defined in Article 6 and including mapped floodplain and hillside areas in exchange for a minimum of 20 percent site preservation as natural area.

Floodplain

Floodplain standards in Article 6 restrict development to specific uses within the floodway and require a Floodplain Development Permit for development within the Special Flood Hazard Area (100-year floodplain) or floodway. Development (including residential) and subdivisions are allowed or conditionally allowed within the Special Flood Hazard Area. A variance process is available to all floodplain standards as a safety valve. General floodplain development and land division standards are included below:

- 6.110 Site Improvement, Land Division and Manufactured Home Park Standards. Site improvements, land divisions, and manufactured home parks in the Special Flood Hazard Area (100-year floodplain) shall be reviewed by the Planning Division as a part of the land use review process. An application to develop property that has floodplain on it, but where no

development is proposed in that floodplain will be processed as otherwise required in this Code. In the case of a land division, “no actual development” means the floodplain area has been excluded from the land division. This can be done by setting the property aside for some other purpose than later development (for example, as a public drainage right-of-way). [Ord. 5746, 9/29/10]

In addition to the general review criteria for site improvements, land divisions and manufactured home parks, applications that propose actual development within the Special Flood Hazard Area shall also be subject to the following standards: [Ord. 5338, 1/28/98; Ord. 5746, 9/29/10]

- (1) All proposed new development and land divisions shall be consistent with the need to minimize flood damage and ensure that building sites will be reasonably safe from flooding.
- (2) All new development and land division proposals shall have utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize flood damage.
- (3) On-site waste disposal systems shall be located and constructed to avoid functional impairment, or contamination from them, during flooding.
- (4) All development proposals shall have adequate drainage provided to reduce exposure to flood damage.
- (5) Any lot created for development purposes must have adequate area created outside of the floodway to maintain a buildable site area meeting the minimum requirements of this Article.
- (6) Any new public or private street providing access to a residential development shall have a roadway crown elevation not lower than one foot below the 100-year flood elevation.
- (7) All development proposals shall show the location of the 100-year flood contour line followed by the date the flood elevation was established. When elevation data is not available, either through the Flood Insurance Study or from another authoritative source, and the development is four or more acres or results in four or more lots or structures, the elevation shall be determined and certified by a registered engineer. In addition, a statement located on or attached to the recorded map or plat shall read as follows: “Development of property within the Special Flood Hazard Area as most currently established by the Federal Emergency Management Agency or City of Albany may be restricted and subject to special regulations by the City.” [Ord. 5338, 1/28/98]

Floodway has more restrictive standards for uses allowed and engineering requirements:

- 6.100 Floodway Restrictions. No development is allowed in any floodway except when the review body finds that the development will not result in any increase in flood levels during the occurrence of the 100-year flood. The finding shall be based upon applicant-supplied evidence prepared in accordance with standard engineering methodology approved by FEMA and certified by a registered professional engineer and upon documentation that one of the following criteria has been met: [Ord. 5875, 10/28/16]
 - (1) The development does not involve the construction of permanent or habitable structures (including fences). [Ord. 5746, 9/29/10]
 - (2) The development is a public or private park or recreational use or municipal utility use.
 - (3) The development is a water-dependent structure such as a dock, pier, bridge, or floating marina.

Hillside Development

Hillside Development standards in Article 6 apply to sloped areas over 12% as identified on Plate 7 of the Comprehensive Plan (unless the applicant's surveyor or engineer can show the property does not contain 12% or greater slopes). For all slopes over 12%, a geotechnical report is required. Article 6 does not refer to the table provided in Comprehensive Plan Chapter 2, Goal 7, Measure 11 (above).

Ashland

Comprehensive Plan Policies

The City of Ashland's Comprehensive Plan, last updated in 2019, contains policies related to the following hazards:

- Floodplain
- Hillside Development
- Wildfire

Ashland has mapped these hazards in its Physical and Environmental Constraints map set, including:

- Floodplain Corridor Lands Map
- Hillside Lands & Severe Constraints Map
- Wildfire Lands Map

Comprehensive Plan Chapter 4: Environmental Resources, contains Ashland's Goal 7 policies. Ashland's latest Plan update to Goal 7 policies is unclear; Chapter 4 indicates a print date of 2005.

Geologic hazards beyond hillside development (e.g., existing inactive fault lines) are identified in the plan but not addressed by specific plan policies.

Floodplain Policies

Ashland builds on federal floodplain regulations with additional self-identified and mapped floodplain areas.¹ Floodplain and downstream impact protections are emphasized in comprehensive plan policies:

- Policy 27. The City shall continue to participate in the National Flood Insurance Program, complying with all applicable standards.
- Policy 28. In flood prone areas, allow alternatives to urban development, such as agriculture, open space, parks, wildlife habitat, natural areas and recreational uses through the physical and environmental regulations in the City code.
- Policy 29. Development in any flood prone area is not a guaranteed right, but depends upon whether the benefits to the public outweigh problems which would be caused by development, especially problems which may occur upstream or downstream during flooding.

¹ "The Planning Commission and the Citizen Planning Advisory Commission met to review data from July to November 1988. The city planning staff, assisted by Rogue Council of Government staff Eric Dittmer and Wes Reynolds, gathered available data and photographs of floods, conducted field work, and established base maps for the new flood maps. Historian Kay Atwood compiled all journalistic records of flooding in historic times. After the last meeting, final maps and ordinance proposals were produced.

The study resulted in the definition of a floodplain corridor larger than the FEMA 100-year floodplain on Ashland and Clay Creeks. The ordinance prohibits division of land and restricts new construction and fill in all defined floodplains in the city." Ashland Comprehensive Plan p.23

- Policy 30. New development (including fill) shall be allowed in floodways only upon the finding that obstruction of flood waters is minimized. Non-structural solutions to flooding are preferable to structural solutions.
- Policy 31. Fill of flood fringe areas shall require a permit as specified in the physical and environmental constraints regulations and fill shall be engineered and compacted to City standards. Fills shall be kept to the minimum necessary to achieve project purposes.
- Policy 32. Apply special physical and environmental restrictions to all areas of Ashland which are identified as flood-prone, streams in the federal study, and other significant drainage ways.
- Policy 33. All existing natural drainage ways as identified on the physical and environmental constraints map shall be left in a natural state or modified only after City approval.
- Policy 34. As proposed with active streambeds, an analysis of potential runoff from upstream hard-surface areas shall be conducted, and streambed profiles shall be adapted to accommodate the flow to prevent flooding of adjacent residences. The City shall acquire easements to maintain the carrying capacity of said streambeds.

Hillside Development (Areas of Steep Slope) Policies

Ashland limits lot creation and development in areas of very steep slope. These policies include a density limit of 2 du/acre on areas of 30% or greater slope:

- Policy 39. Develop erosion control standards to ensure that development of these forested areas will not cause erosion problems.
- Policy 40. Restrict creation of new lots on land that is greater than 40% slope, unless a buildable area of less than 40% slope is available on each lot.
- Policy 41. Zone all lands which have a slope generally greater than 30% for development that will have no more than 2 dwelling units per acre or 20% lot coverage by impervious surfaces.

Wildfire Policies

Ashland takes a proactive approach to wildfire protection, identifying wildfire hazards related to the urban-wildland interface areas and proposing several policies to protect life, property, and environmental resources:

- Policy 46. Require installation and maintenance of a 40-foot fuel break around each dwelling unit or structure.
- Policy 47. Require multi-dwelling unit developments to install and maintain a perimeter fuel break to prevent fire from entering the development, or to prevent a fire spreading from the development and threatening the Ashland Watershed. (Width of break is dependent on topography, aspect, vegetation, types and steepness of slopes.)
- Policy 48. Where vegetation needs to be maintained for slope stability in a fuel break area, require plantings of fire-resistant or slow-burning plants. The City shall make a list of such plants available to the public. (See "Wildfire Hazard Management in the Urban/Wildland Interface in Southern Oregon," by Claude Curran - May 1978.)
- Policy 49. Require more than one ingress/egress route or road widths wide enough to accommodate incoming fire apparatus and evacuating residents simultaneously in an emergency situation.
- Policy 50. Require roofs to be constructed of fire-resistant materials. Wood shake or shingle roofs would not be allowed.

- Policy 51. Encourage road placement to function as fire breaks in urban/wildland interface developments.
- Policy 52. Require chimneys of wood-burning devices to be equipped with spark arrester caps and/or screens.
- Policy 53. Install all new electrical distribution circuits in the urban/wildland interface underground if technically feasible.
- Policy 54. The City shall encourage and support education/ information programs dealing with wildfire hazards in the urban/wildland interface. Information shall be made available through the City Building and Planning Departments to developers and builders wishing to build in the urban/wildland interface.

Goal 7 Land Use Regulations

Ashland’s natural hazards land use regulations are contained in the Ashland Land Use Ordinance, Chapter 18.3.10, Physical and Environmental Constraints Overlay. These areas have a blanket onsite density transfer option for sites with “unbuildable” areas, with a maximum density of no more than two times the permitted density of the underlying zone.²

Floodplain

Ashland has prepared a Flood Plain Corridor Lands Map. This map includes, as described in Section 18.3.10.060:

- 1. All land contained within the 100-year Flood Plain as defined by the Federal Insurance Administration and identified in the Flood Insurance Map (FIRM) adopted by the City Council as provided for in AMC 15.10.
- 2. All land within the area defined as Flood Plain Corridor Land in maps adopted by the Council as provided for in section 18.3.10.070 Official Maps.
- 3. All lands which have physical or historical evidence of flooding in the historical past.
- 4. All areas within 20 feet (horizontal distance) of any stream identified as a Riparian Preservation Creek on the Physical and Environmental Constraints Floodplain Corridor Lands map adopted pursuant to section 18.3.10.070 Official Maps.
- 5. All areas within ten feet (horizontal distance) of any stream identified as a Land Drainage Corridor on the Physical and Environmental Constraints Floodplain Corridor Lands maps adopted pursuant to section 18.3.10.070 Official Maps.

Development and land division is limited in flood plain corridor lands, including standards for fill, residential and non-residential building elevation above flood levels (or floodproofing for non-residential development), structure placement, building envelopes, and local streets and utility connections. Residential development and land divisions are allowed but limited to minimize impact to the floodplain. Ashland also has a building code chapter (Chapter 15.10) dedicated to flood damage prevention.

Severe Constraint Lands – Floodplain

Ashland identifies areas within the floodway channels as having characteristics that “severely limit normal development.” These areas are unbuildable to the extent possible while avoiding a taking on lots of record.

² See Section 18.3.10.120 Density Transfer

Hillside Development

Ashland has prepared a Physical and Environmental Constraints Hillside Lands map. Hillside Lands are lands that are subject to damage from erosion and slope failure, and which include areas that are highly visible from other portions of the city. Hillside areas include all lands defined as Hillside Lands and which have a slope of 25 percent or greater.

Hillside regulations require a geotechnical report for all development on Hillside Lands, and include requirements for terracing and revegetation, limits on fill slope height, tree protection,³ and building envelope and design standards.⁴

Severe Constraint Lands – Slope

Ashland identifies areas with slope greater than 35 percent as having characteristics that “severely limit normal development.” These areas are unbuildable to the extent possible while avoiding a taking on lots of record.

Wildfire

Wildfire Lands are identified on the Physical and Environmental Constraints Wildfire Lands map. The Wildfire Hazard Zone is shown below, with recent historical fire context:



³ E.g., per Section 18.3.10.090.D.5 “Development shall be designed to preserve the maximum number of trees on a site.”

⁴ Including several “recommendations” intended to encourage visual integration of the development into the hillside and natural environment.

Any development or land division within these areas is required to prepare a Fire Prevention and Control Plan, and establish and maintain a fuel modification area (generally crown separation, tall brush removal, tree limbing, etc.).

Ashland integrates natural resource, water quality, and hillside considerations to wildfire requirements:

- l. Where necessary for erosion control, slope stability, riparian and wetland preservation and enhancement, performing functions considered beneficial in water resource protection, or aesthetic purposes, existing vegetation may be allowed to be retained consistent with an approved Fire Prevention and Control Plan, or upon written approval of the Staff Advisor in consultation with the Fire Code Official.
- m. Fuel modification in areas which are also classified as Hillside Lands or Water Resource Protection Zones shall be included in the erosion control measures outlined in section [18.3.10.090](#), Development Standards for Hillside Lands, and management plan for water resource protection zones in section [18.3.11.110](#).

Bend

Comprehensive Plan Policies

The City of Bend's Comprehensive Plan, last updated in 2018, contains general policies related to the following hazards:

- Floodplain
- Geologic
- Hillside Development
- Wildfire

Comprehensive Plan Chapter 10: Natural Forces, contains Bend's Goal 7 policies. Bend's latest Plan update to Goal 7 policies was completed with the 2016 Comprehensive Plan update.

Floodplain Policy

- Policy 10-12. The city shall continue to apply their Flood Plain zoning regulations along the Deschutes River and Tumalo Creek based on the best available data.

Geologic Policies

- Policy 10-13. The city shall encourage the Oregon Department of Geology and Mineral Industries to complete an assessment of faults in the Bend area.
- Policy 10-14. The city shall review the construction plans for buildings that are proposed to be built across or along identified fault lines.

Hillside Development (Steep Slope) Policies

Bend provides erosion control and slope stability policy direction for slopes greater than 10 percent, and policy options to reduce minimum density or require cluster development in areas with slopes over 20 percent as "Steep Slopes" policies:

- Policy 10-15. The city shall require development on slopes in excess of 10 percent to employ measures to minimize the hillside cuts and fills for streets and driveways.
- Policy 10-16. The location and design of streets, structures and other development features on slopes in excess of 10 percent shall give full consideration to the natural contours, drainage

patterns, and vegetative features of the site to protect against temporary and long-term erosion.

- Policy 10-17. In areas where the natural slope exceeds 20 percent, the city may reduce the minimum residential density (allow larger lots) or alternatively, may require cluster development through the PUD process to preserve the natural topography and vegetation, and improve fire protection.

Wildfire Policy

Bend is a signatory to the Greater Bend Community Wildfire Protection Plan, providing an education-based strategy for wildfire reduction.

Bend has a policy to adopt strategies to reduce wildfire hazard. Of note, this may include defensible space buffers to land included in the UGB and annexed:

- Policy 10-18. The City will adopt strategies to reduce wildfire hazard to lands inside the City and included in the Urban Growth Boundary. These strategies may, among others, include the application of the International Wildland-Urban Interface Code with modifications to allow buffers of aggregated defensible space or similar tools, as appropriate, to the land included in the UGB and annexed to the City of Bend.

Goal 7 Land Use Regulations

Bend's natural hazard land use regulations are contained in the Bend Development Code (Title 10) and Gradients, Excavation and Stormwater Management (Title 16). The development code contains specific floodplain regulations in the Floodplain Combining Zone overlay, and integrates both floodplain and steep slope into the "sensitive lands" (or "sensitive areas" in Title 16) definition.

Bend allows onsite density transfer from sensitive lands including the 100-year floodplain, but limits density transfers to areas exceeding 25 percent slope.⁵ Development code interaction with "sensitive lands" is also discussed below.

Bend Code Title 16 provides additional engineering permitting requirements for grading and erosion control on steep slope.

Floodplain

Bend regulates floodplain through the Floodplain Combining Zone. The Floodplain Combining Zone applies to FIRM 100-year flood and floodway areas and requires a permit for any development in the zone. Regulation in floodplain areas includes elevation requirements for residential and non-residential development (or floodproofing for non-residential development), and requirements for subdivisions and development:

- BDC 2.7.640.J. Land Development Standards in a Flood Hazard Area.
 1. In addition to the terms of subsections (J) and (K) of this section, a subdivision or other land development, including all utility facilities, within an FP Zone shall be designed, located, and constructed to minimize flood damage, including special provisions for adequate drainage to reduce exposure to flood hazards.
 2. A land development which will alter or relocate a watercourse shall be designed, constructed and maintained to retain the flood carrying capacity of the watercourse.

⁵ Bend Development Code Section 3.5.100

3. Where base flood elevation data has not been provided or is not available from another authoritative source, it shall be generated for subdivision proposals and other proposed developments which contain at least 50 lots or five acres (whichever is less).

Within the floodway, development requires additional engineering analysis:

- BDC 2.7.640.M. Floodways. Located within areas of special flood hazard established in subsection (B)(1) of this section, Application of FP Zone, are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles, and erosion potential, the following provisions apply:
 1. Prohibit encroachments, including fill, new construction, substantial improvements, and other development unless certification by a registered professional civil engineer is provided demonstrating through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.

Variances from zone standards are allowed as a safety valve:

- BDC 2.7.640.P. Technical Variances. A technical variance from the requirements of this section may be granted by the Hearings Body for new construction and for improvements to existing structures which could not otherwise be authorized, provided the construction or improvements are to be erected or installed on a parcel of land one-half acre or less in size, contiguous to or more or less surrounded by lots with existing structures constructed below the minimum floor elevation established for flood protection purposes. A parcel of land in excess of one-half acre in single ownership on the effective date of the ordinance codified in this code is not excluded from the granting of a technical variance, but the burden of proof required for issuing the variance increases as the size of the property under single ownership increases, and the variance shall be granted only if required to equalize circumstances, considering previously developed land adjacent to the parcel for which a variance is sought.

Floodplains are also included in sensitive lands, as discussed below.

Slope

Bend's regulation of steep slope areas has implications for lot and parcel size, and is included in grading and erosion control requirements.

- BDC 3.1.200.C. General Requirements for Lots and Parcels. [...]
 2. On steep slopes, increased lot or parcel sizes may be required to avoid excessive cuts, fills and steep driveways.

Bend regulates development on steep slope through general construction requirements⁶ for a clearing, grading, and erosion control permit if altering or creating a slope exceeding 20 percent. Steep slopes are included in sensitive lands, as discussed below.

Sensitive Lands

Sensitive lands include both floodplain and steep slope areas. Sensitive lands regulations impact minimum density and density transfer.

⁶ Bend Code Title 16, Section 16.10.020 Clearing, Grading and Erosion Control on Construction Sites

- Section 1.2 Definitions: Sensitive lands means wetlands, significant trees, steep slopes, floodplains and other natural resource areas designated for protection or conservation by the Bend Comprehensive Plan or the State of Oregon. [emphasis added]

“Steep slope” is not defined in the Development Code, but is defined in Title 16:

- 16.05.060 Definitions and Acronyms: Steep slope means slopes that are greater than 10 percent. As noted above, the “Steep Slopes” policies in the comprehensive plan apply to slopes over 10 percent.

Therefore, “sensitive lands” in the context of natural hazards would logically include areas of 10 percent or greater slope and floodplain.

- BDC 2.1.600 Residential Density C.2. Minimum housing densities are calculated as follows:
 - a. The area subject to minimum housing density is the total site area excluding any land to be developed with or dedicated for neighborhood commercial uses, public and institutional uses, and miscellaneous uses that do not include a dwelling unit; **sensitive lands**; fire breaks; and canals and their associated easements.
- BDC 3.5.100 Density Transfers C. Density Transfer Authorized. Allowed housing units may be transferred from one portion of a property to another portion of the same property, or from one property to another contiguous property. The density transfer shall protect sensitive land areas as listed below either by dedication to the public or a land trust, or by a nonrevocable conservation easement. Sensitive land areas include:
 1. Land within the 100-year floodplain;
 2. Land or slopes exceeding 25 percent;
 3. Drainage ways;
 4. Wetlands;
 5. Identified Areas of Special Interest;
 6. Goal 5 Resources;
 7. A stand or grove of significant trees as defined in BDC Chapter 3.2.

Grants Pass

Comprehensive Plan Findings

The City of Grants Pass Comprehensive Plan, last amended in 2015, contains findings⁷ related to the following hazards:

- Floodplain
- Geologic
- Hillside Development (Slope)
- Soils

Comprehensive Plan Chapter 5: Areas Subject to Natural Hazards Index, contains Grants Pass Goal 7 findings. Grants Pass latest Plan update to Goal 7 policies was completed with the 2009 Comprehensive Plan update.

Grants Pass participated in crafting the Rogue Valley Integrated Community Wildfire Protection Plan, which provides educational guidance for wildfire protection in the region.

⁷ The Grants Pass Comprehensive Plan uses Findings instead of Policies.

Floodplain Findings

Grants Pass floodplain findings include soft guidance for designating floodplain areas as open space, encouraging stormwater solutions, and advocating for density transfer in floodplain areas. The City used federal guidelines to adopt a floodplain ordinance.

- Finding 6. Land use regulations can minimize the loss of life and property due to the flooding. Floodprone land that is designated as open space for parks, wildlife areas and floodways can enhance the livability of the community while reducing future potential losses of life and property from flooding. Land use regulations can also be used to set aside land areas for the detention of storm water. Storm water detention areas such as wetlands, grassed waterways and woodlands may reduce existing and future flooding conditions. Density transfer is a method to encourage the preservation of storm water detention areas without affecting the revenue potential of developments in such areas.
- Finding 7. The National Flood Insurance Program is intended to encourage local government to adopt and enforce land use practices within floodprone areas to the degree necessary to reduce the risk to acceptable levels as set forth in the program. The City of Grants Pass has adopted a floodplain ordinance that adopts by reference the federal engineering report entitled "The Flood Insurance Study for the City of Grants Pass." That ordinance specifies that development in the floodplain may not raise the elevation of the 100-year flood by more than one foot, and, therefore, all new development must construct the level of the first livable floor at least one foot above the 100-year flood elevation.

Geologic Findings

Grants Pass determined that the existing fault line is inactive and the region is geologically dormant.

- Finding 2. There are two geologic formations in the Grants Pass UGB area. The overlying formation is composed of recent stream deposits of sand, silt and gravel. The underlying formation is a large mass of igneous material that is composed of quartz diorite. There are several major faults in Josephine County but only one within the UGB area: a north-south fault that is parallel to McLean Drive, and a north-south fault east of Interstate 5 in the vicinity of Terrace Drive. No recent movement of any faults has been detected in Josephine County. There are no earthquake epicenters. The region is geologically dormant.

Hillside Development (Slope) Findings

Grants Pass identified slopes greater than 15 percent on the Slope Hazards map and found that development on slopes between 15 and 35 percent should be reviewed by a soils scientist and an engineer, while development on slopes over 35 percent should require geotechnical review.

- Finding 3. The slopes in the UGB area range from 0% to greater than 60%.
- Finding 4. There is a low potential for earthflows for slopes less than 15%. Moderate potential for earthflows exist between 15% to 35%, although areas of unusually wet or unstable soil can increase that potential. Slopes over 35% generally have a high to extreme potential for earthflows, especially when the integrity of the slope is disturbed by removal of vegetation, excavation and construction.
- Finding 5. The slopes greater than 15% are identified on the Slope Hazards map. Generally, these slopes are located at the edge of the UGB in the Northwest, Northeast and Harbeck-Fruitdale subareas.

- Finding 6. The most effective method for the city and county to minimize the hazards of development on steep slopes is to review the development process in these areas. Developments that are proposed on slopes between 15% and 35% should be reviewed by a soil scientist and an engineer in order to reduce the hazard potential. Developments that are proposed on slopes in excess of 35% should be required to have the development plans reviewed by a licensed engineering geologist in order to ensure that soil erosion and earth movement hazards are minimized.

Soil Hazard Findings

Grants Pass delved into soil characteristics and identified situations where soils analysis should be encouraged.

- Finding 7. Soils are composed of decomposed rock and organic material and are basically defined by the content of rock particles and organic matter, and structure. Soil types vary according to geographic area due to the diversity of weathering forces, topography, climate and vegetation. There are forty-one different soil types in the UGB area each with distinct characteristics which make them either more or less suitable for urban developments. Table 5.20.4 identifies the soils and their general characteristics related to urban development. These characteristics are erosion factor, road construction, buildings with or without basements, shrink-swell potential and corrosivity. The information in Table 5.20.4 is derived from the soil data of the U.S. Soils Conservation Service. The ratings for each soil should be considered general guidelines. Where necessary clarification is required, then a site specific soil analysis should be performed by a soil scientist.
- Finding 8. The single most important potential soil hazard is erosion. Preventive measures for soil stability on erodible soils is often the best safeguard. Such preventive measures are:
 - traps to keep top soil on the site
 - leave natural vegetation in place
 - reducing surface water run-off with vegetative planting and keeping natural water retention areas
- Finding 9. Other important soils-related hazards such as shrink-swell and road construction can be mitigated by forewarning builders and developers early in the development process. Site specific analysis of soils should be encouraged in all developments with slopes in excess of 35%.

Goal 7 Land Use Regulations

Grants Pass natural hazards land use regulations are contained in the Grants Pass Development Code, Article 13: Special Purpose Districts, which describes requirements for development within the Slope Hazard District and Flood Hazard District.

Floodplain

The Grants Pass Flood Hazard District includes FIRM 100-year floodplain and floodway areas, and requires a permit prior to any development within the District. Development is required to be anchored, elevated (or floodproofed for non-residential development), and use flood resistant materials. Development and land divisions are required to meet the following standards:

- 13.256 Subdivision and Development Proposals, Partitions, and Planned Unit Developments. No proposed subdivision or partition of land or planned unit development plan, or other development located within an area of special flood hazard shall be approved without meeting

the requirements of this article. All of the applicable mapping and certification requirements of this article shall be met at the Tentative Map, Plat or Plan stage of review for subdivisions, partitions, and planned unit developments (See also Article 17, Lots and Creation of Lots, and Article 18, Planned Unit Development.)

- (1) All development proposals, including subdivision proposals, shall be consistent with the need to minimize flood damage;
- (2) All development proposals, including subdivision proposals, shall have public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize or eliminate flood damage;
- (3) All development proposals, including subdivision proposals, shall have adequate drainage provided to reduce exposure to flood damage; and
- (4) Where base flood elevation data has not been provided or is not available from another authoritative source, it shall be generated for development proposals, including subdivision proposals, which have the potential for 5 dwelling units or more or contain 1 acre or more, whichever is less.

Variances are available as a safety valve but are held to a high standard of review (multiple pages of standards).⁸

Slope

The Grants Pass Slope Hazard District encompasses areas of at least 15 percent slope and contains two classes of slope: Class A (between 15 and 25 percent) and Class B (greater than 25 percent). Development within the Slope Hazard District requires a Steep Slope Development Report and Grading and Erosion Plans. Class A documentation requires a licensed engineer stamp, while Class B requires a geotechnical engineer or engineering geologist stamp.

Restrictions on development within the Slope Hazard District include erosion control measures and retaining wall height is limited to 20 feet.

Newberg

Comprehensive Plan Policies

The City of Newberg's Comprehensive Plan, last updated in 2020, contains policies related to the following hazards:

- Floodplain
- Hillside Development / Geological

Comprehensive Plan Chapter II.F: Areas Subject to Natural Hazards, contains Newberg's Goal 7 policies. Newberg's latest Plan update to Goal 7 policies was an update to floodplain policies in 2010.

Floodplain Policies

Newberg has straightforward policies to comply with federal and state floodplain and greenway protections.

- Policy 1. The City will coordinate with the Federal Emergency Management Agency to ensure continued compliance with federal flood plain regulations.

⁸ See GPDC Section 13.246.

- Policy 2. The City will adopt the most current Federal Emergency Management Agency Flood Insurance Rate Maps, the Flood Insurance for Yamhill County to ensure that property owners may participate in the National Flood Insurance Program.
- Policy 3. The City will adopt floodplain development standards to:
 - minimize public and private losses,
 - protect human life and health,
 - minimize expenditure of public money and costly flood control projects,
 - minimize damage to public facilities, and
 - help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard,
 - to ensure property owners may participate in the National Flood Insurance Program. (Ordinance 2010-2719, March 1, 2010)
- Policy 4. The largest floodplain area within the Urban Growth Boundary is located within the Willamette Greenway. As such, this area will be subject to Greenway plans and regulations.

Hillside Development / Geological Policy

Newberg identifies “hazardous areas” as areas with slopes 20 percent or greater, or with geological limitations. Development may be permitted in hazardous areas if consistent with sound engineering and planning criteria.

- Policy 5. In other areas of potential or existing hazards, development shall be subject to special conditions. Reasonable development may be permitted in these areas when it can be shown, based on sound engineering and planning criteria, that adverse impacts can be mitigated and kept to a minimum. Hazardous areas shall be considered to be lands with slopes 20% or greater, potential and existing slide areas, fault areas, and areas with severe soil limitations.
- Policy 6. The City will discourage development on hazardous slope areas and natural resource areas in the Riverfront District. (Ordinance 2002-2564, April 15, 2002)

Goal 7 Land Use Regulations

Newberg natural hazards land use regulations contained in the Newberg Development Code are limited to floodplain, covered by Chapter 15.343, Areas of Special Flood Hazard Overlay.

Sloped areas are regulated by Title 13 Public Utilities and Services, which “may require” additional erosion and sediment controls on slope of 10 percent or more.

Floodplain

Newberg’s Areas of Special Flood Hazard Overlay District applies to areas identified by FIRM maps as within the 100-year floodplain or floodway. Development within this District requires a Floodplain Development Permit. New development requires anchoring, flood resistant materials, and elevation (or floodproofing for non-residential development). Land divisions are required to minimize flood damage:

- NDC 15.343.040.A.4. Tentative Subdivision and Partition Plat Proposals.
 - a. Where floodplain development is proposed or reasonably likely, all tentative subdivision and partition plat proposals shall be consistent with the need to minimize flood damage.
 - b. All tentative subdivision and partition plat proposals shall have public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize or eliminate flood damage.

c. All tentative subdivision and partition plat proposals shall have adequate drainage provided to reduce exposure to flood damage.

d. For any proposed affected structure, proposed subdivision or partition, and other proposed floodplain development which contains at least 50 lots or five acres (whichever is less), flood elevation data shall be provided.

Of note, there is significant overlap between the Flood Hazard overlay and other applicable layers of development restriction – notably the stream corridor district that protects riparian areas and associated wetlands, and the Willamette River Greenway.

Redmond

Comprehensive Plan Policies

The City of Redmond’s Comprehensive Plan, last updated in 2020, contains general policies related to non-specific natural hazards, and does not identify floodplain, slope, or fire hazards.

Comprehensive Plan Chapter 7: Natural Hazards, contains Redmond’s Goal 7 policies. Redmond does not appear to have updated its Goal 7 policies since plan acknowledgment in 1981.

Goal 7 Policies

- Policy 1. Areas subject to natural disasters shall be evaluated as to the degree of hazard present.
- Policy 2. Plans taking into account known areas of natural disasters and hazards shall be considered as a major determinant, the carrying capacity of the air, land and water resources of the planning area. The land conservation and development actions provided for by such plans shall not exceed the carrying capacity of the planning area.
- Policy 3. When locating developments in areas of known natural hazards, the density or intensity of the development shall be limited by the degree of the natural hazard.
- Policy 4. Natural hazards that could result from new developments, such as runoff from paving projects and soil slippage due to weak foundation soils, shall be considered, evaluated and provided for.

Goal 7 Land Use Regulations

Redmond’s Development Code (City Code Chapter 8) contains relatively few specific regulations related to natural hazards. This is logical, as the Redmond Urbanization Study indicates:

“Redmond has no land that is unavailable for development due to physical constraints: steep slopes, wetlands, riparian areas, and floodways. This is due to the city’s location and the fact that the dry canyon is mostly in public ownership.”⁹

However, evaluation of hazards may be required during site and design review:

- RDC 8.3030 Special Studies, Investigations and Reports. Special studies, investigations and reports may be required to insure that the proposed development of a particular site does not adversely affect the surrounding community, does not create hazardous conditions for persons or improvements on the site. These may include traffic impact studies impact of contaminated

⁹ P. 3-9 Redmond Urbanization Study (ECONorthwest, 2005)

soils, soil conditions, flooding of waters and excessive storm water runoff, tree preservation, and other concerns of the development's impact on adjacent properties or public facilities. Redmond also has regulations related to Goal 7 hazards associated with Master Development Plans in Article I Section 8.0300. Grading regulations in Article III Section 8.2720 relate to slope. Flooding and floodplains are regulated through stormwater and building codes.

Floodplain

Redmond does not appear to have floodplain regulations adopted as part of the development code. Flooding, erosion control, and floodplain regulations are regulated through the city's stormwater regulations in the City Code, Chapter 4 – Utilities, and also regulated through the building code in Chapter 9 – Building and Fire Codes.

Slope

In Redmond, Master Development Plans are detailed development plans required for phased development, area plans within urban holding zones, and areas requesting annexation. Master Development Plans are required to map *and plan* for natural hazard areas as a submittal requirement:

- 8.0300.3.C.7. Natural Hazard Areas. Inventory areas subject to natural hazards, particularly steep slopes, and program urban development that is suitable for the identified hazard areas;

In addition, Master Development Plans are required to address and implement Great Neighborhood Principles, where open spaces and green design criteria may also interact with natural hazard areas:

- 8.0300.3.C.13.c. Open spaces, greenways, recreation. All new neighborhoods shall provide useable open spaces with recreation amenities that are integrated to the larger community. Central parks and plazas shall be used to create public gathering places where appropriate. Incorporate significant geological features such as rock outcroppings, stands of clustered native trees, etc. into the design of new neighborhoods. Neighborhood and community parks shall be developed in appropriate locations consistent with policies in Redmond's Parks Master Plan.
- 8.0300.3.C.13.i. Green Design. Environmentally friendly and energy efficient design is encouraged for public and private infrastructure, architecture and building orientation, open spaces and natural areas and transportation facilities. In addition, the planting of native, drought-resistant trees is encouraged to provide shade and to minimize water usage.

Redmond's grading requirements also require mitigation of steep slopes:

- 8.2720.1. Slopes shall be less than or equal to 3 to 1 (horizontal to vertical) unless slope reinforcement and low maintenance surfaces are provided. Cut slopes as steep as 1 to 1 are permitted in native rock material if that material is suitable to stand at the slope without raveling. Toe of full slopes steeper than 3 to 1 and top of cut slope shall be no closer than 2 feet from the property line.
- 8.2720.5. Foundations should be stepped or other measures used to minimize cuts and fills. Slopes steeper than 3:1 shall be landscaped, terraced, or receive other treatment to reduce the visual impact and minimize the need for maintenance.

Appendix 2: Natural Hazard Overlay Methodology

Prepared by:



Winterbrook Planning | June 24, 2021 | *Revised Draft*

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Data and Sources

- DOGAMI: Landslide Susceptibility
- DOGAMI: Landslide Inventory - Statewide Landslide Information Database for Oregon (SLIDO)
- DOGAMI: LiDAR and Digital Elevation Model (10 Meters)
- DOGAMI: Earthquake Shaking and Liquefaction Risks
- DLCD and DOGAMI: Oregon Statewide Flood Hazard Database - FEMA Flood Insurance Studies – 2015
- Yamhill County Community Wildfire Protection Plan (CWPP, Revised 2015): Rural Fire Protection Districts
- USFS Pacific Northwest Region Wildfire Risk Assessment (PNRA) – 2018
- Date: April, 2018Geospatial Enterprise Office: Oregon Rivers
- Geographic Information Services Unit, ODOT: Oregon Transportation Network – 2017
- DLCD: McMinnville Urban Growth Boundary – 2018
- Yamhill County Tax Assessor: Yamhill County Tax Lots
- DLCD: Oregon Zoning
- DLCD: Oregon City Limits
- DLCD: Oregon Natural Hazards Mitigation Plan (Oregon NHMP) – 2020

I. Methods by Mapping Product

Inventory I-1: McMinnville Natural Hazards Study Area

1. Isolate McMinnville Urban Growth Boundary (UGB) from statewide 2018 Urban Growth Boundary file.

2. Modify UGB to reflect adopted 2020 amendments

Inventory I-2: McMinnville Study Area Slopes

1. Slice Digital Elevation Model (DEM) 10 Meters to SA
2. Use “Slope” tool to generate Slope raster by percent rise
3. Use “Reclassify” to reclassify raster by 0% to 14.9%, 15% to 24.9%, 25% to 39.9%, and 40% or greater
4. Use “Raster to Polygon” to convert Slope to polygons
5. Use “Contour” to convert DEM in SA to 10 Meter Contours. Contour interval: 10 meters. Contour type: contour.

Inventory I-3: McMinnville Rural Areas Zoning

1. Clip Oregon Zoning (OZ) to SA
2. Clip Tax Lots (TL) to SA
3. Display OZ based on field “orZDesc”

Inventory II-1: McMinnville Geologic Hazards: Landslides

1. Slice Landslide Susceptibility raster (LS) to SA
2. Use “Raster to Polygon” to convert LS to polygons
3. Dissolve LS on field “Description”
4. Display LS based on field “Description” for moderate and high risk areas

Inventory II-2: McMinnville Geologic Hazards: Cascadia Subduction Earthquake Shaking

1. Import TIF of Earthquake Shaking areas into ARC
2. Resize and align to SA
3. Create new polygon shapefile
4. Trace “Severe Shaking” areas
5. Union new Shaking polygon to SA
6. Define areas outside of “Severe Shaking” as “Very Strong Shaking” areas
7. Display Shaking polygon by “Severe Shaking” and “Very Strong Shaking”

Inventory II-3: McMinnville Geologic Hazards: Earthquake Liquefaction Susceptibility

1. Dissolve by “Liquefaction Susceptibility Score”
2. Clip to SA
3. Classify and display by “Liquefaction Susceptibility Score”
 - a. Low Risk: Susceptibility Score 2
 - b. Moderate Risk: Susceptibility Score 3
 - c. High Risk: Susceptibility Score 4

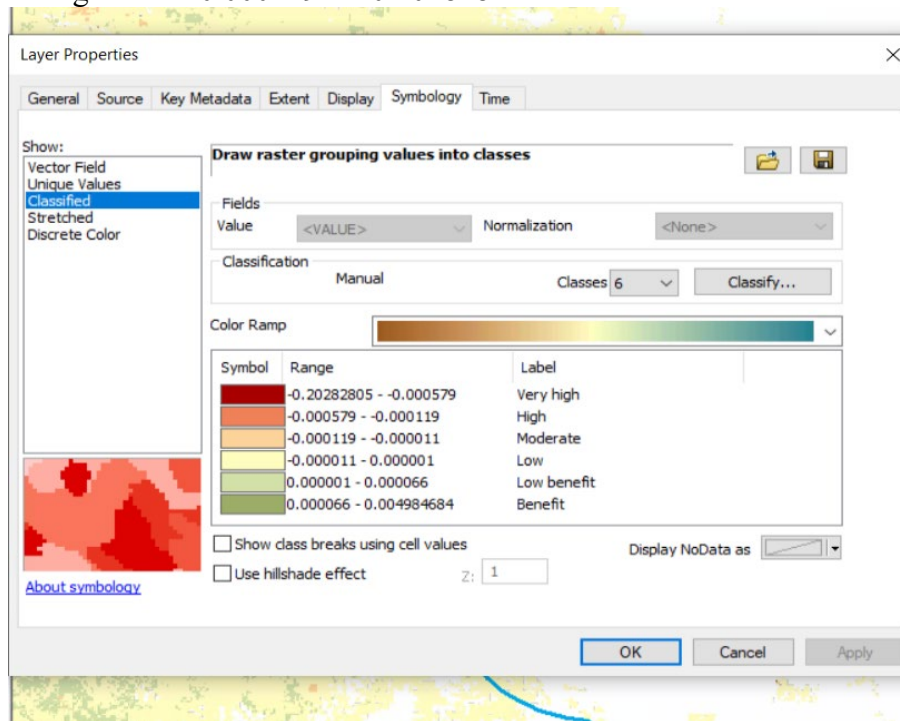
Inventory III-1: McMinnville Flood Hazards

1. Clip Flood (FL) layer to SA
2. Dissolve by field “FLD_ZONE”
3. Classify and display by field “FLD_ZONE”

Inventory IV-2: McMinnville Potential Wildfire Impact to People and Property

1. Display “Potential Impact to People and Property” layer in wildfire geodatabase
2. Check projection to read: NAD_1983_Oregon_Statewide_Lambert_Feet_Intl
3. Use “Reclassify” to reclassify raster:

- a. Delete: Fire Benefits: 0.004984684 to 0
- b. 0: Low Risk: 0 to -0.000011
- c. 1: Moderate Risk: -0.000011 to -0.000119
- d. 2: High Risk: -0.000119 to -0.202828



- e.
4. Use “Raster to Polygon” to convert tif file to polygons
5. Dissolve by reclassified grid code
6. Clip to SA
7. Classify and display by grid code

Composite Hazards VII-1: McMinnville Proposed Natural Hazard Overlay

1. For each final shapefile clipped and displayed in the inventory maps, add a field “Prob_S” and assign the following individual hazard score to the hazard risk levels defined by natural hazard type (see table below).

| Natural Hazard Type | Hazard Risk Level | Individual Hazard Score |
|-------------------------------------|-------------------|-------------------------|
| Landslide | Moderate | 2 |
| | High | 5 |
| Cascadia Subduction Zone Earthquake | | |
| Liquefaction | Moderate | 2 |
| | High | 5 |
| Shaking | Very Strong | 2 |
| | Severe | 5 |
| Slope | > 25% | 5 |
| Wildfire | Moderate | 2 |
| | Severe/High | 5 |
| Flood | Floodplain | 5 |
| | Floodway | 5 |

2. Delete hazard risk levels that are not described in the table above from all of the natural hazard final shapefiles (i.e., “very low”, “low”, no flood risks, etc.).
3. Use “Union” to combine all modified hazard final shapefiles into a single shapefile: Natural Hazard Overlay (NHO)
4. Clip NHO to McMinnville UGB
5. Assign “0” to probabilities (Prob_S) with “null”
6. Add a field “Total_Prob” that sums all hazard probabilities (Prob_S)
7. Reference the Oregon Natural Hazards Mitigation Plan (ORNHMP) to determine vulnerability assessments for Yamhill County. Vulnerability assessments are displayed in the table below and are derived from the following tables within the ORNHMP report:
 - a. Table 2-8. Earthquake Hazard, 2020 Risk Assessment
 - b. Table 2-9. Flood Hazard, 2020 Risk Assessment
 - c. Table 2-10. Landslide Hazard, 2020 Risk Assessment
 - d. Table 2-12. Volcanic Hazard, 2020 Risk Assessment
 - e. Table 2-13. Wildfire Hazard, 2020 Risk Assessment
 - f. Table 2-14. Seven Hazards Combined, 2020 Risk Assessment

| Hazards for Yamhill County | Probability | Physical Vulnerability | | | | Social Vulnerability | Vulnerability (Social + Physical) | | Risk (Prob. + Physical Social) | |
|----------------------------|-------------|------------------------|---------------------------|---------------------------|---------------------------|----------------------|-----------------------------------|---------------|--------------------------------|------|
| | | State Buildings | State Critical Facilities | Local Critical Facilities | Total Combined & Rescaled | | Total Combined & Rescaled | Vulnerability | Total Combined & Rescaled | Risk |
| Earthquake | 4.00 | 3.00 | 3.00 | 2.00 | 2.67 | 4.00 | 3.33 | VH | 3.56 | VH |
| Flood | 4.00 | 1.00 | 1.00 | 2.00 | 1.33 | 4.00 | 2.67 | M | 3.11 | H |
| Landslide | 5.00 | 1.00 | 1.00 | 2.00 | 1.33 | 4.00 | 2.67 | M | 3.44 | VH |
| Volcanic | 1.50 | 1.00 | 1.00 | 1.00 | 1.00 | 4.00 | 2.50 | M | 2.17 | L |
| Wildfire Hazard | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 | 4.00 | 2.50 | M | 2.33 | M |
| County Total | | | | | | | | | 2.92 | H |

8. Add the following fields to represent hazard vulnerabilities: “Vul_Earth”, “Vul_Flood”, “Vul_Lands”, and “Vul_WF”
9. Assign the following vulnerability score to each corresponding field when that hazard is present (see table below)

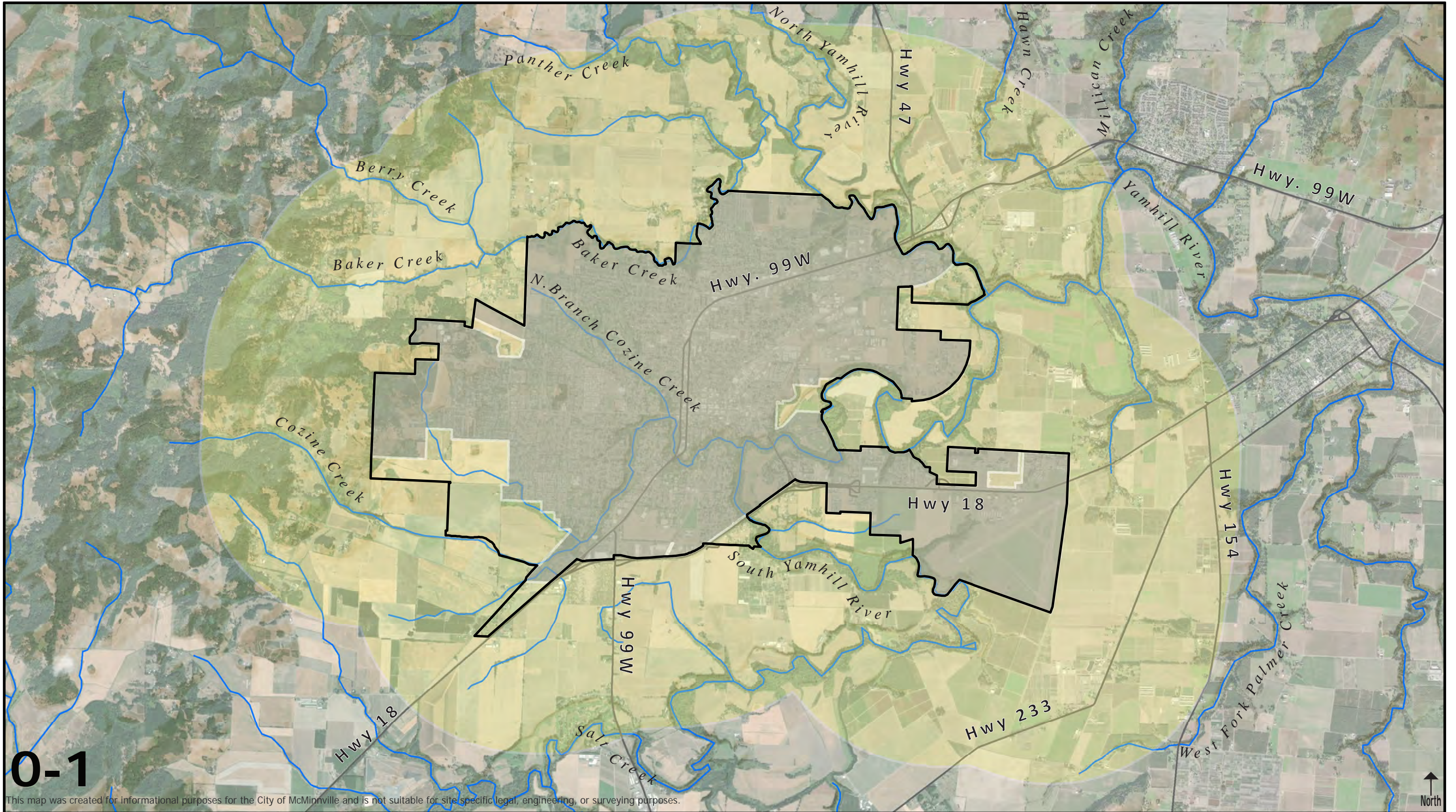
| Natural Hazard Type | Probability of the Hazard in McMinnville | | Social + Physical Vulnerability |
|-------------------------------------|--|---|---------------------------------|
| Landslide | Moderate | 2 | 2.67 |
| | High | 5 | 2.67 |
| Cascadia Subduction Zone Earthquake | | | |
| Liquefaction | Moderate | 2 | (Earthquake) 3.33 |
| | High | 5 | |
| Shaking | Very Strong | 2 | |
| | Severe | 5 | |
| Slope | ➤ <u>25%</u> | 5 | - |
| Wildfire | Moderate | 2 | 2.50 |
| | Severe/High | 5 | |
| Flood | Floodplain | 5 | 2.67 |
| | Floodway | 5 | |

10. Add a field “New_Tot” and calculate based on the sum and average of the total probability and the vulnerability fields
11. Classify and display by “New_Tot” in the following breaks:
 - a. No Subdistrict: 0.533 – 0.99
 - b. Mitigation: 1 – 1.499
 - c. Protection: 1.5 – 3.517
12. Refine Overlay
 - a. Identify polygons under 1,000 sq. ft. that are noncontiguous to other mitigation/protection areas
 - b. Polygons under 1,000 sq. ft. and within riparian corridor categorized as either mitigation or no overlay and were touching a protection layer were reclassified as protected
 - c. Mitigation polygons under 1,000 sq. ft. touching a protection layer and isolated from other mitigation areas were reclassified as protected
 - d. Polygons with no overlay that are under 1,000 sq. ft. that are touching and surrounded by protection areas were reclassified as protected
 - e. Polygons with no overlay that are under 1,000 sq. ft. that are touching and surrounded by both protection and mitigation layer were reclassified as mitigation
 - f. Mitigation polygons under 1,000 sq. ft. that are surrounded by areas with no overlay – protection or mitigation – were reclassified without an overlay
 - g. Repeat process for polygons between 1,000 and 2,000 sq. ft., where deemed appropriate.

Appendix 3: Natural Hazard Inventory and Natural Hazard Overlay Maps

Prepared by:





0-1

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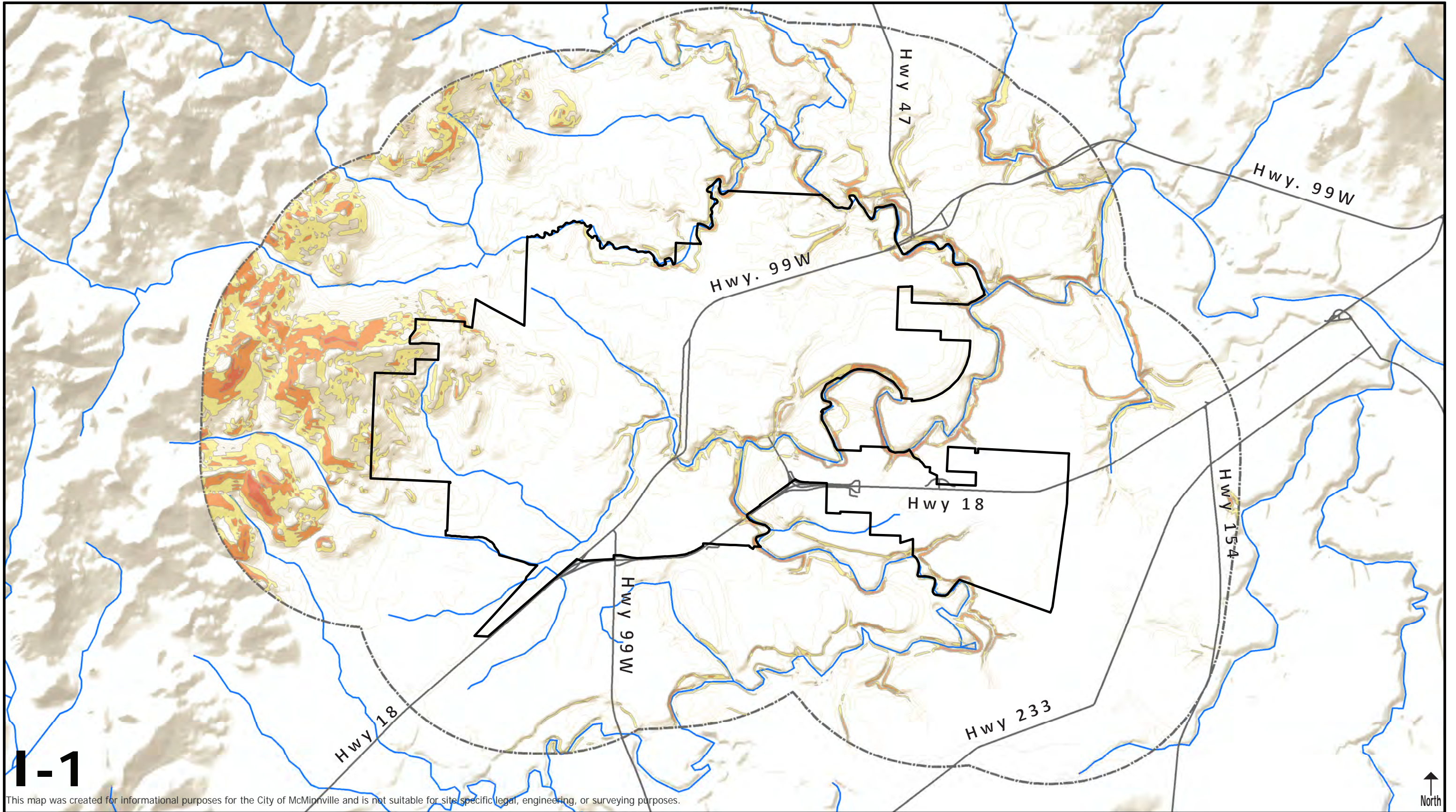
**McMinnville
Natural Hazards
Study Area**

- McMinnville 2021 Urban Growth Boundary
- Study Area (1.5 Miles from 2019 UGB)
- McMinnville 2019 Urban Growth Boundary
- Major Roads
- Rivers & Streams

Miles 0 0.25 0.5 1 1.5 2

Created by Winterbrook Planning in coordination with the City of McMinnville

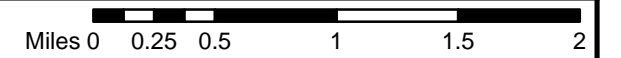
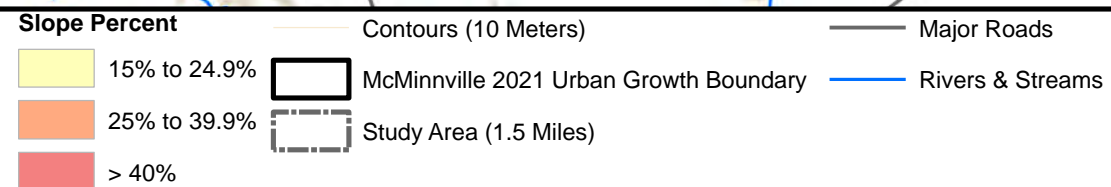
City of McMinnville
WINTERBROOK
Last Revised: June 22, 2021



1-1

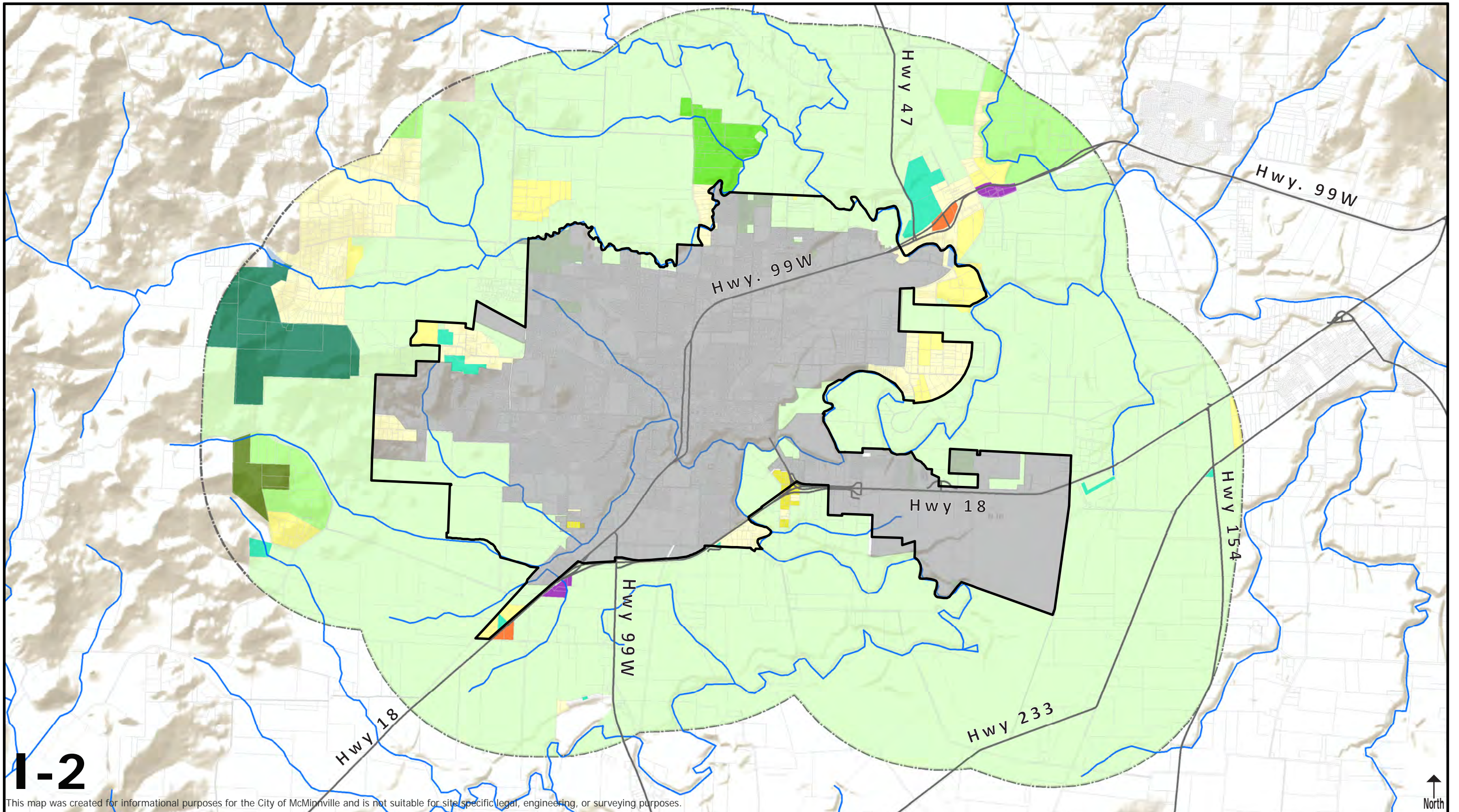
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**McMinnville
Slopes**



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1-2

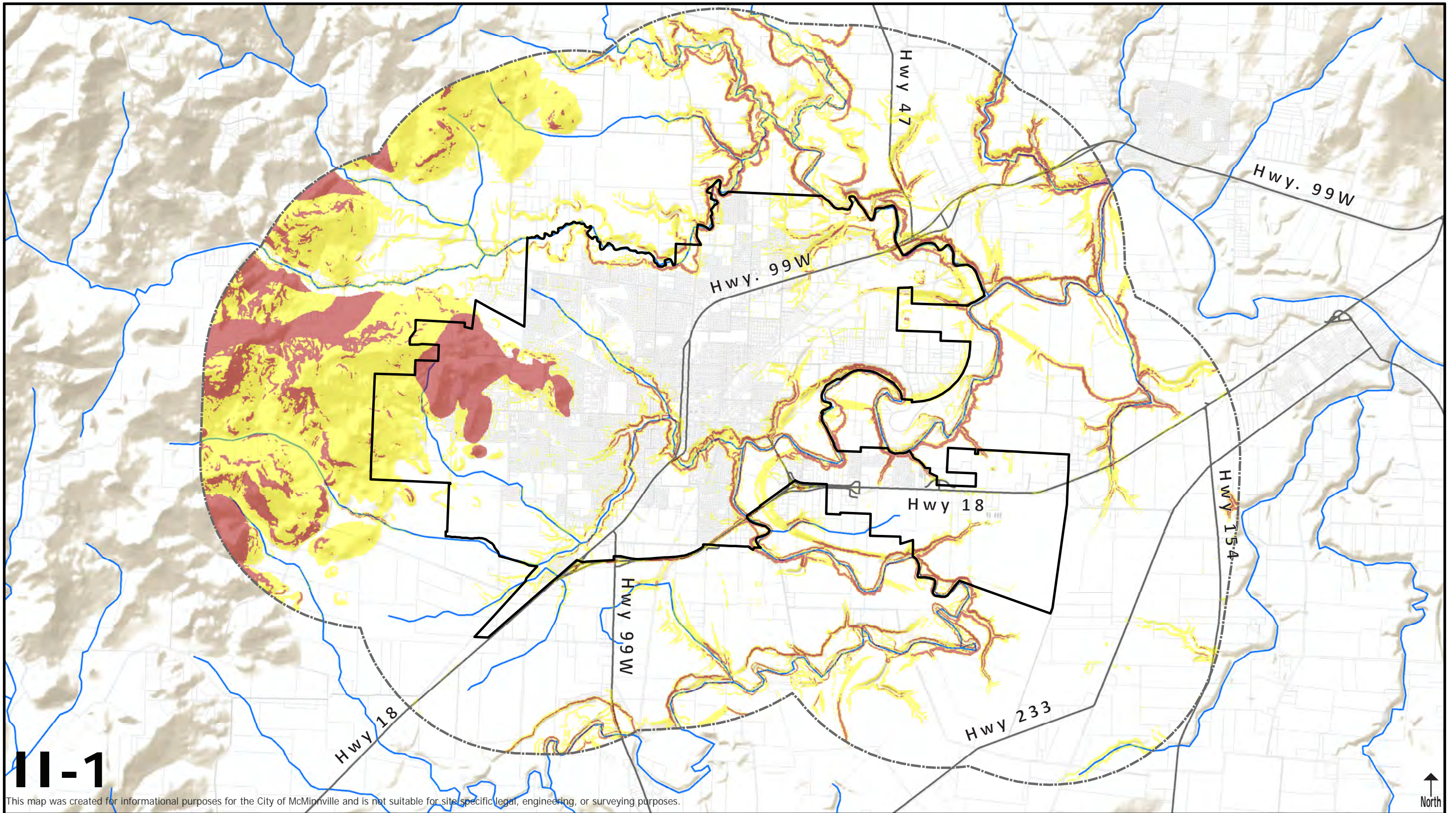
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McMinnville Rural Area Zoning

- | | | | | |
|------------------------------|-------------------------|------------------|-----------------------------|--|
| Yamhill County Zoning | Mixed Farm-Forest 40 | Prime Forest 80 | Rural Residential 1 acre | McMinnville 2021 Urban Growth Boundary |
| Exclusive Farm Use 20+ | Open Space/Conservation | Rural Commercial | Rural Residential 10 acres | Study Area (1.5 Miles) |
| Exclusive Farm Use 40+ | Other | Rural Industrial | Rural Residential 2-4 acres | City Limits |
| Exclusive Farm Use 80 | | | | |

Tax Lots
 Major Roads
 Rivers & Streams

Miles 0 0.25 0.5 1 1.5 2
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 Last Revised: June 21, 2021



11-1

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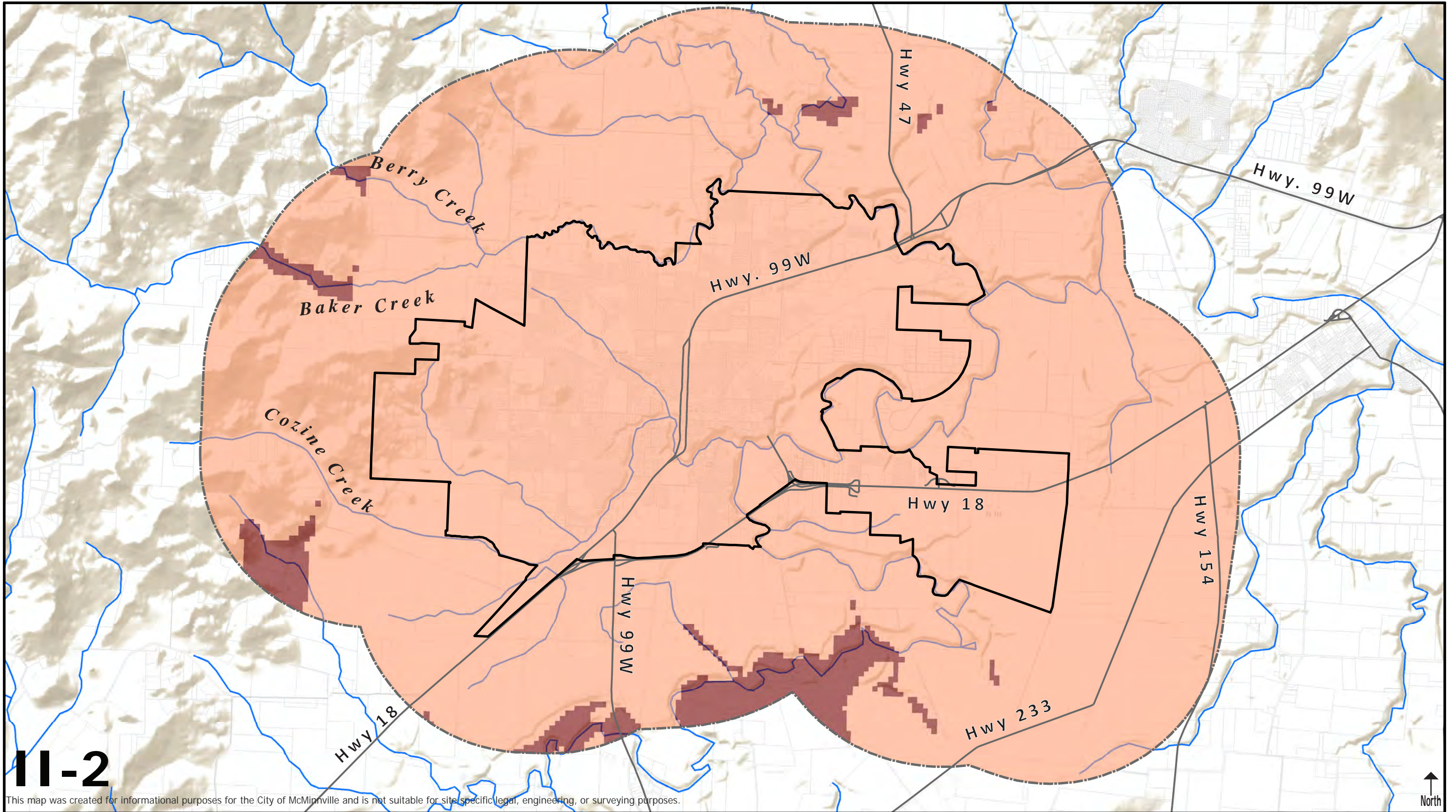
**McMinnville
Geologic Hazards:
Landslides**

- | | | |
|-----------------------|--|------------------|
| Landslide Risk | McMinnville 2021 Urban Growth Boundary | Major Roads |
| Moderate Risk | Study Area (1.5 Miles) | Rivers & Streams |
| High Risk | Tax Lots | |

Miles 0 0.25 0.5 1 1.5 2

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City of McMinnville
WINTERBROOK
Last Revised: June 21, 2021



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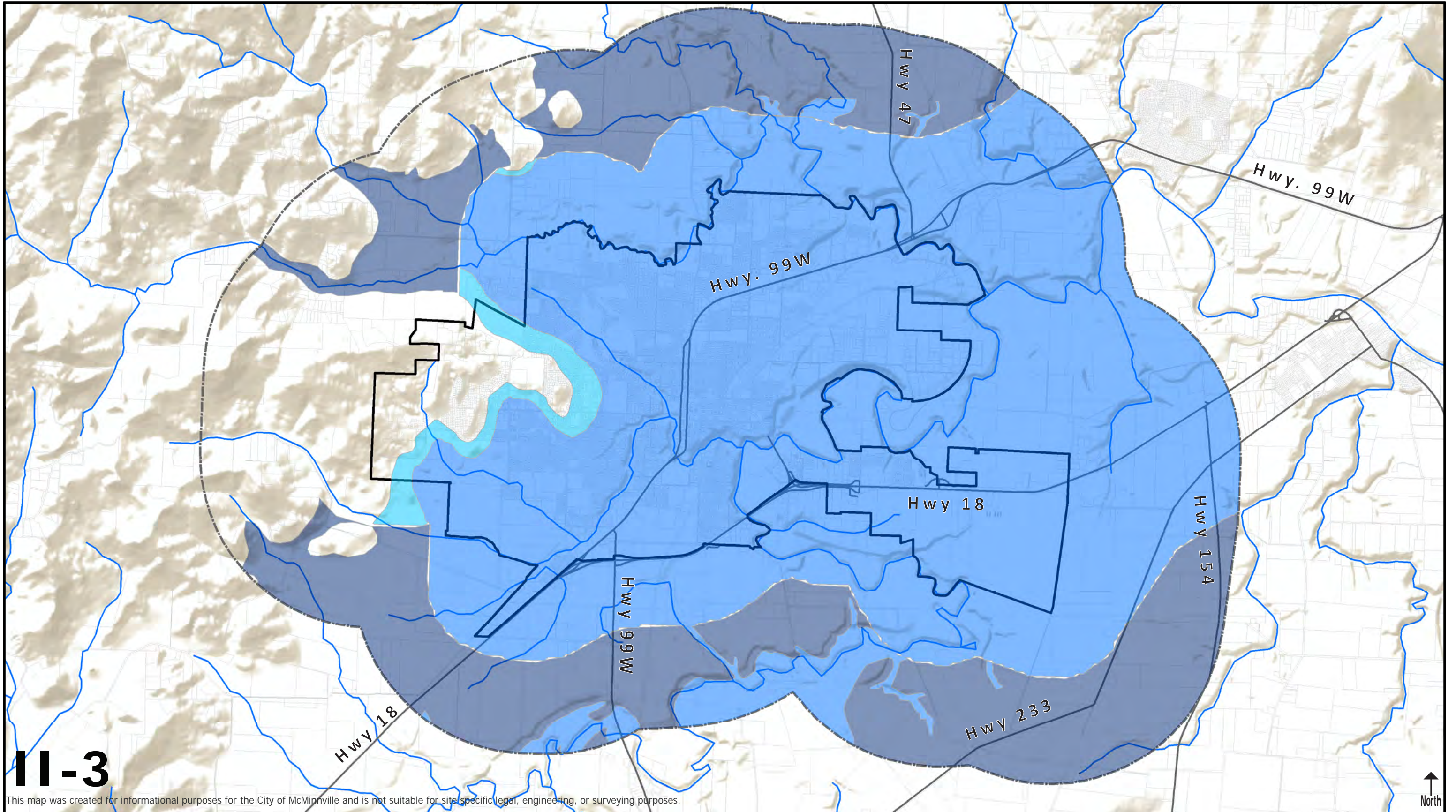
11-2
McMinnville
Geologic Hazards:
Cascadia Subduction
Earthquake Shaking

- | | | |
|-------------------------|--|------------------|
| Expected Shaking | McMinnville 2021 Urban Growth Boundary | Major Roads |
| Very Strong Shaking | Study Area (1.5 Miles) | Rivers & Streams |
| Severe Shaking | Tax Lots | |



Created by Winterbrook Planning in coordination with the City of McMinnville





11-3

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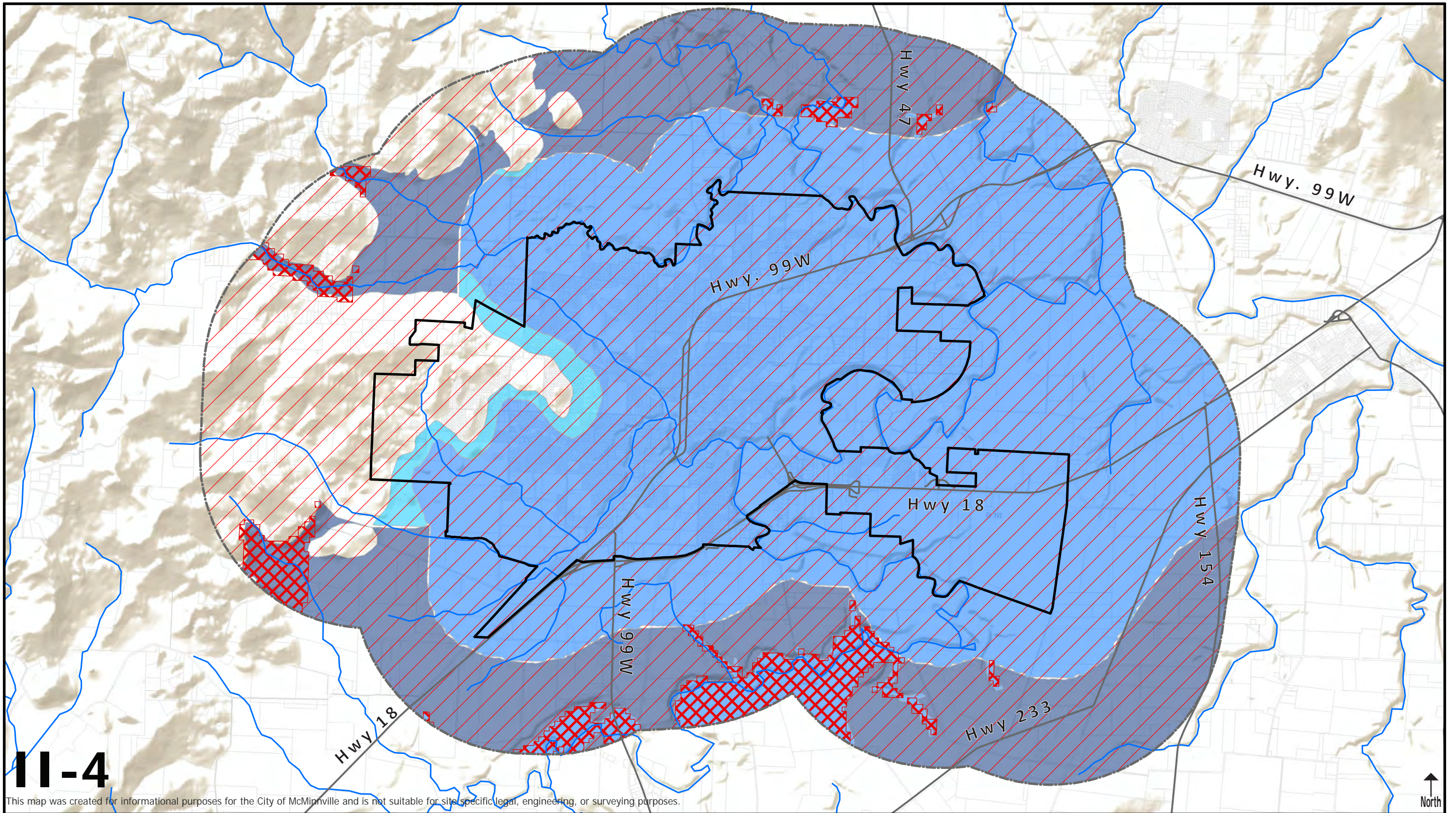
**McMinnville
Geologic Hazards:
Earthquake Liquefaction
Susceptibility**

- | | | | |
|--------------------------|---------------|--|------------------|
| Liquefaction Risk | Moderate Risk | McMinnville 2021 Urban Growth Boundary | Major Roads |
| Low Risk | High Risk | Study Area (1.5 Miles) | Rivers & Streams |
| | | Tax Lots | |

Miles 0 0.25 0.5 1 1.5 2

Created by Winterbrook Planning in coordination with the City of McMinnville

City of McMinnville
WINTERBROOK
Last Revised: June 22, 2021



11-4

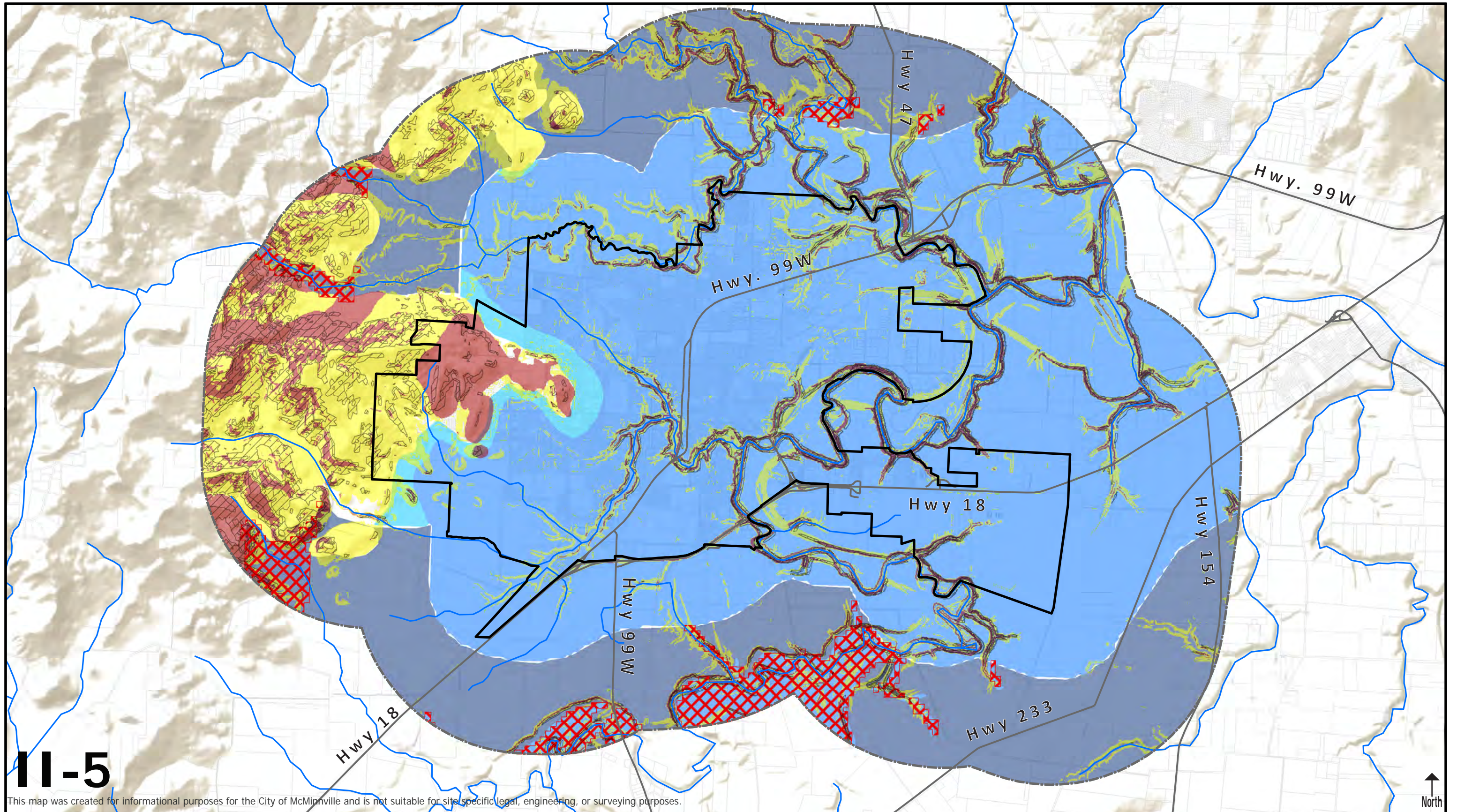
This map was created for informational purposes for the City of McMinnville and is not suitable for site specific legal, engineering, or surveying purposes.

**McMinnville
Geologic Hazards:
Subduction Shaking &
Liquefaction Risks**

| | | | | | | | | | | | |
|--------------------------|----------|---------------|-----------|---------------------|----------------|--|------------------------|----------|-------------|------------------|--------------------------|
| Liquefaction Risk | Low Risk | Moderate Risk | High Risk | Very Strong Shaking | Severe Shaking | McMinnville 2021 Urban Growth Boundary | Study Area (1.5 Miles) | Tax Lots | Major Roads | Rivers & Streams | Miles 0 0.25 0.5 1 1.5 2 |
|--------------------------|----------|---------------|-----------|---------------------|----------------|--|------------------------|----------|-------------|------------------|--------------------------|

Created by Winterbrook Planning in coordination with the City of McMinnville





11-5

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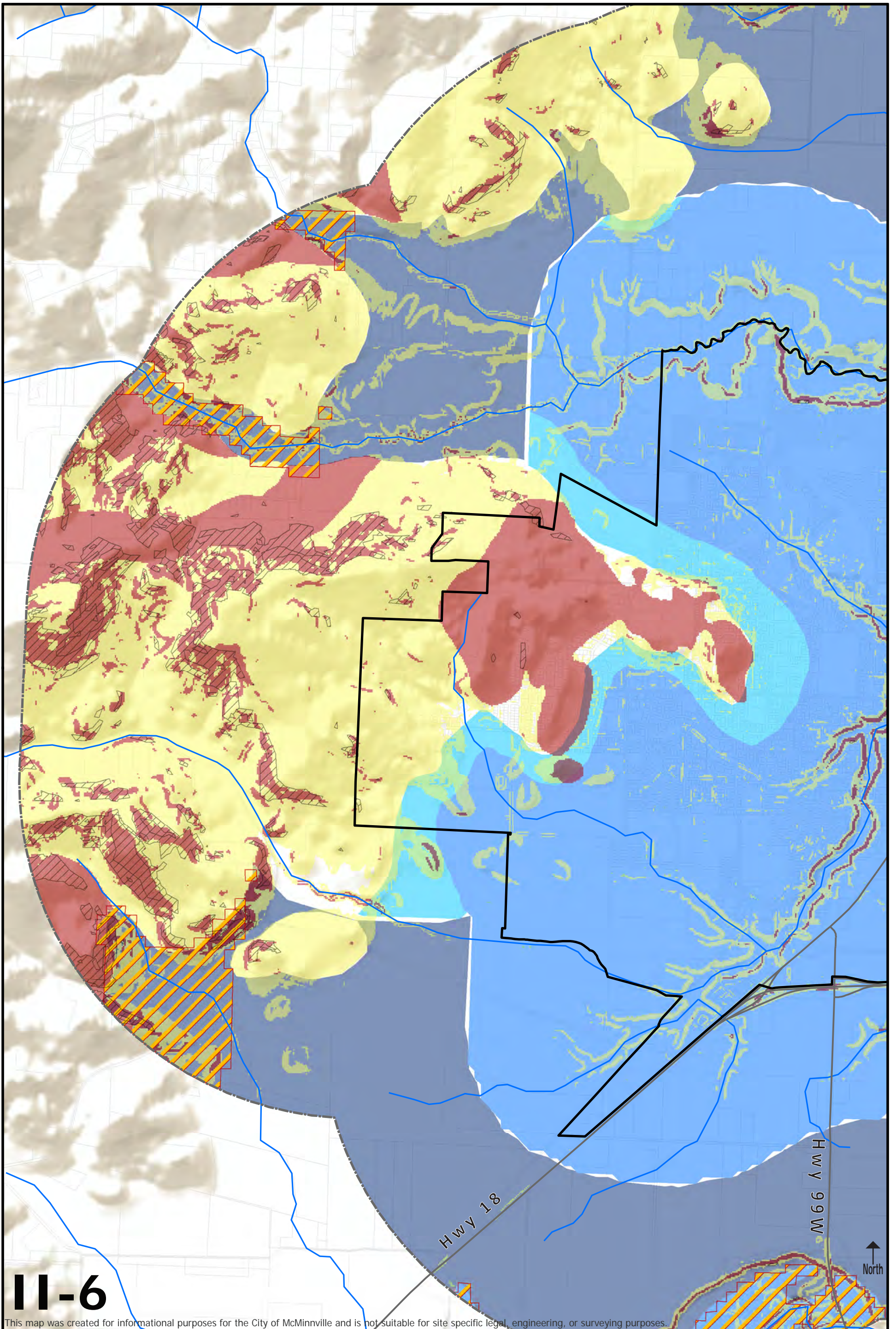
**McMinnville
Geologic Hazards: Landslide,
Liquefaction, Subduction Shaking
& Steep Slopes**

- | | | | |
|-----------------------|--------------------------|--|------------------|
| Landslide Risk | Liquefaction Risk | Severe Shaking | Tax Lots |
| Moderate Risk | Low Risk | Steep Slopes (>15%) | Major Roads |
| High Risk | Moderate Risk | McMinnville 2021 Urban Growth Boundary | Rivers & Streams |
| | High Risk | Study Area (1.5 Miles) | |

Miles 0 0.25 0.5 1 1.5 2

Created by Winterbrook Planning in coordination with the City of McMinnville

City of McMinnville
WINTERBROOK
Last Revised: June 23, 2021



11-6

This map was created for informational purposes for the City of McMinnville and is not suitable for site specific legal, engineering, or surveying purposes.

McMinnville WEST HILLS Geologic Hazards: Landslide, Liquefaction, Subduction Shaking & Steep Slopes

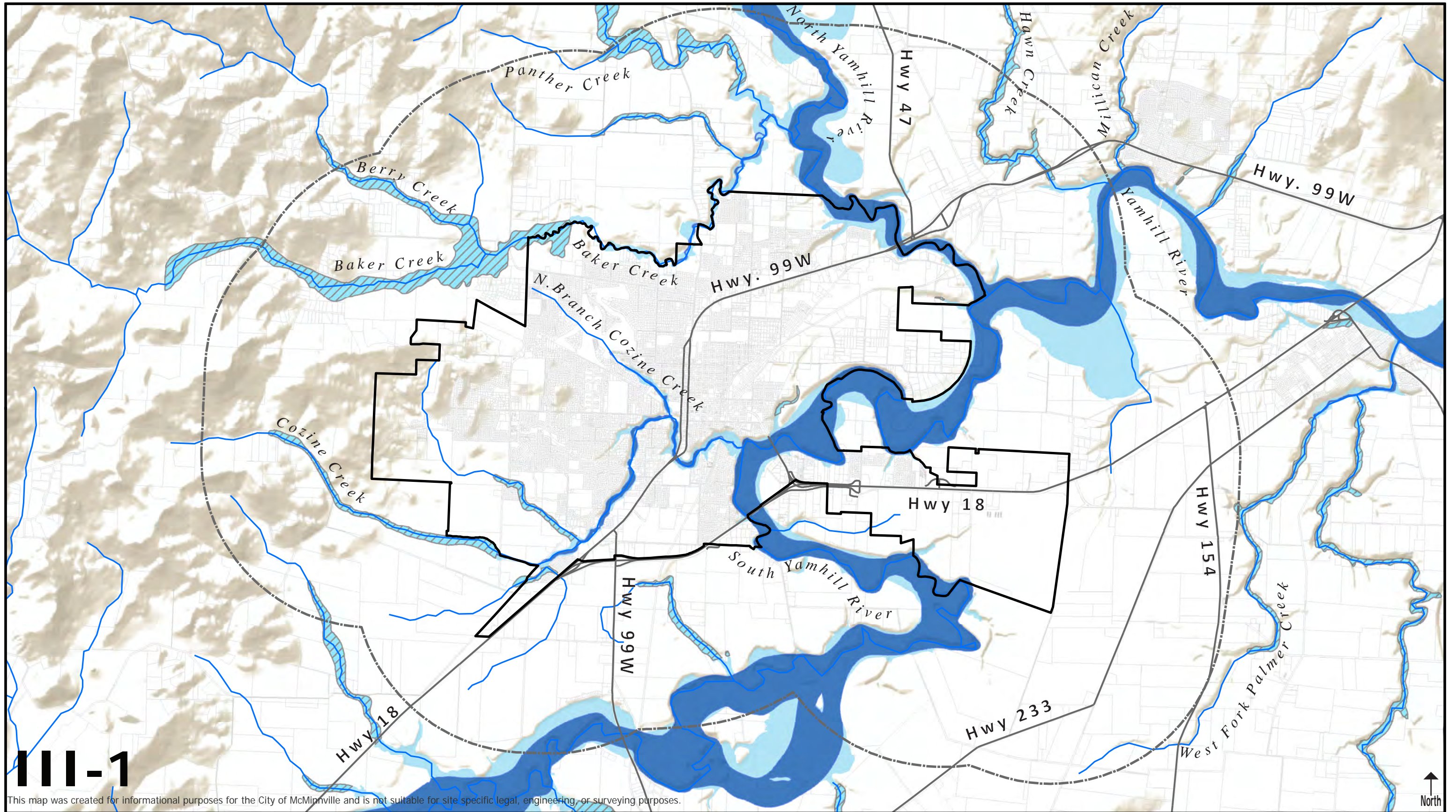
- | | | | |
|-----------------------|--------------------------|--|------------------|
| Landslide Risk | Liquefaction Risk | Severe Shaking | Tax Lots |
| Moderate Risk | Low Risk | Steep Slopes (>25%) | Major Roads |
| High Risk | Moderate Risk | McMinnville 2021 Urban Growth Boundary | Rivers & Streams |
| | High Risk | Study Area (1.5 Miles) | |

Miles 0.125 0.25 0.5 0.75 1

Created by Winterbrook Planning in coordination with the City of McMinnville



Last Revised: June 23, 2021



III-1

This map was created for informational purposes for the City of McMinnville and is not suitable for site specific legal, engineering, or surveying purposes.

**McMinnville
Flood Hazards**

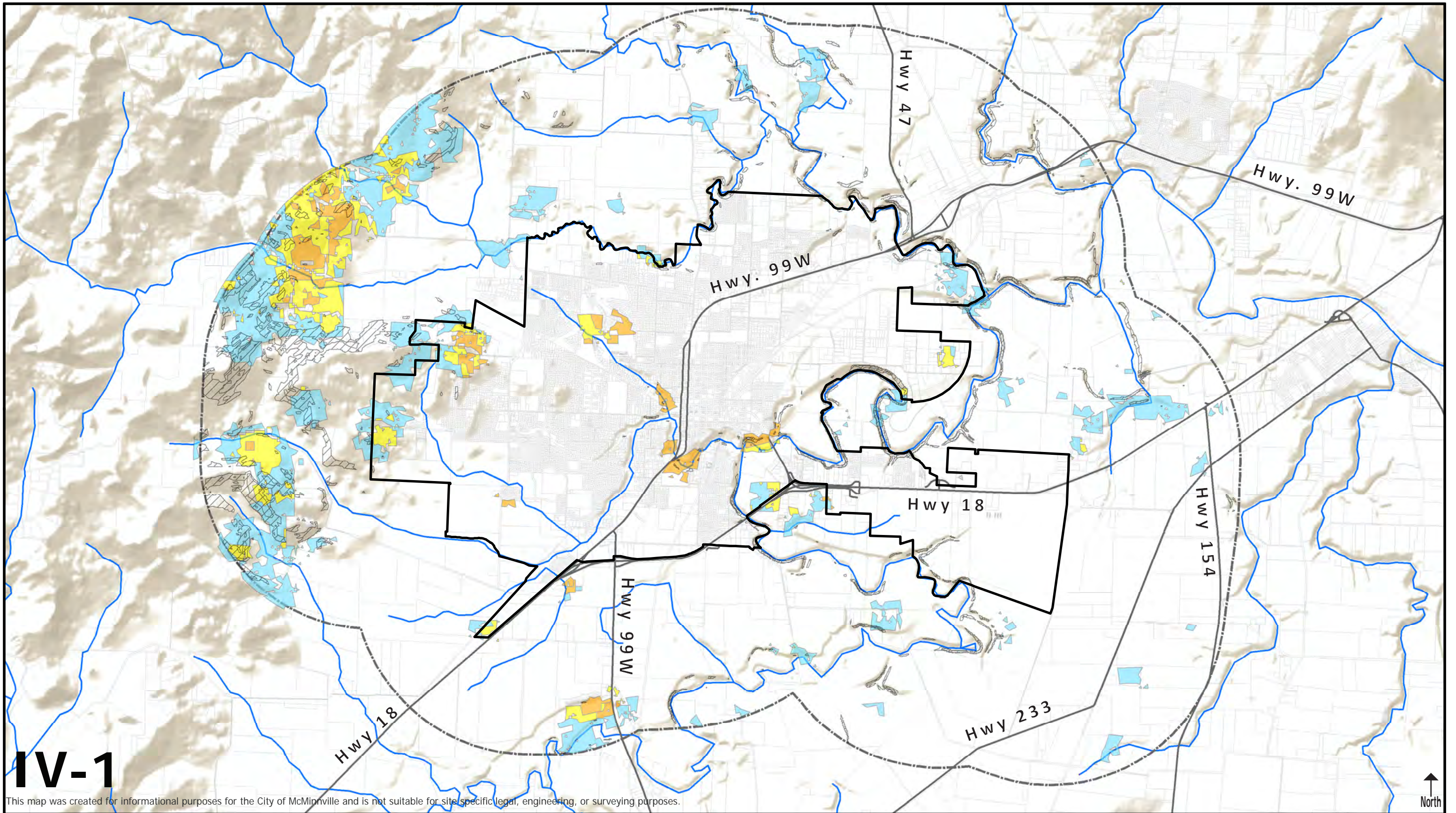
- Floodway
- McMinnville 2021 Urban Growth Boundary
- Major Roads
- Study Area (1.5 Miles)
- Rivers & Streams
- Flood Zone A
- Tax Lots
- Flood Zone AE

Miles 0 0.25 0.5 1 1.5 2

Created by Winterbrook Planning in coordination with the City of McMinnville

City of McMinnville

 Last Revised: June 23, 2021



IV-1

This map was created for informational purposes for the City of McMinnville and is not suitable for site specific legal, engineering, or surveying purposes.

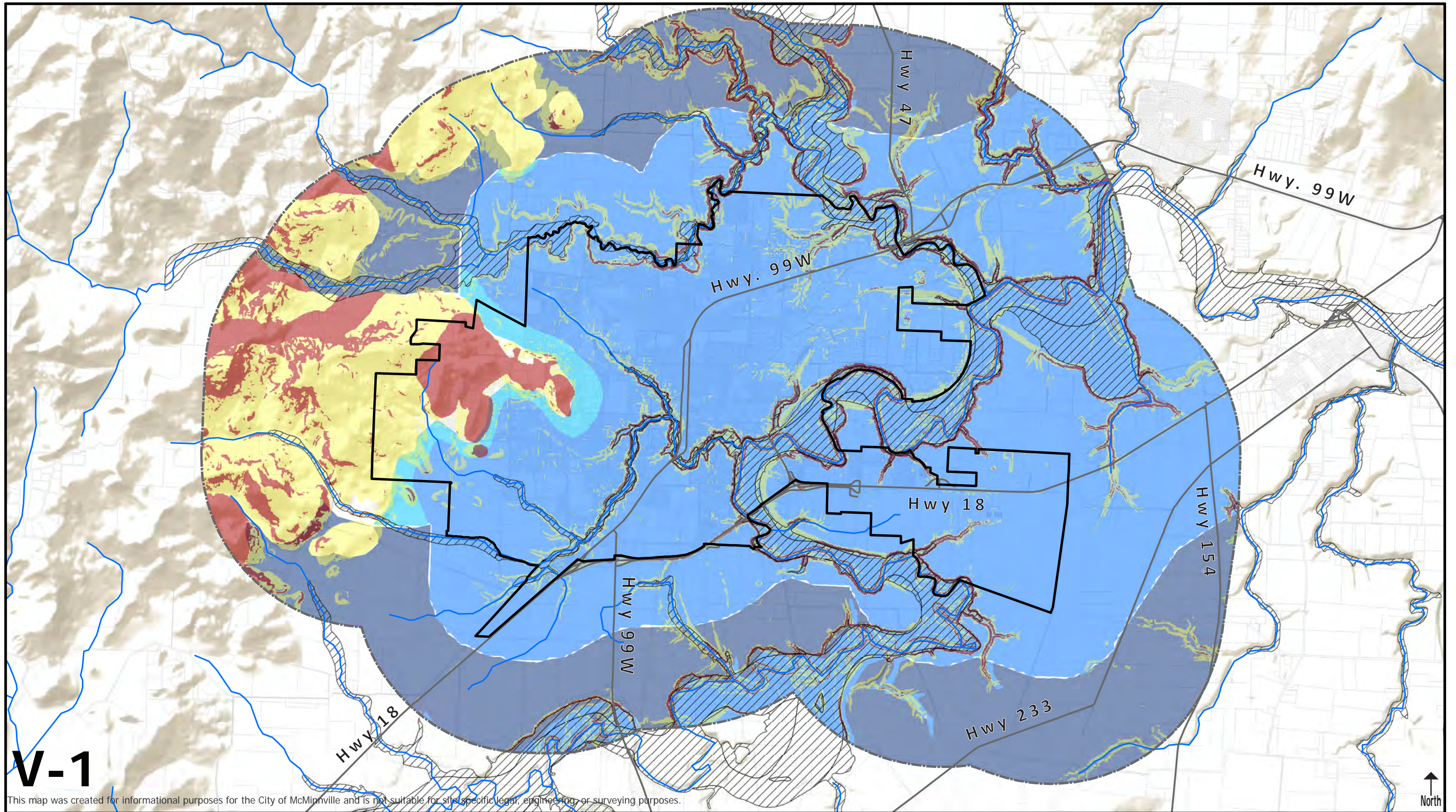
McMinnville Potential Wildfire Impact to People and Property

- | | | |
|----------------------|--|------------------|
| Wildfire Risk | Steep Slopes (>25%) | Major Roads |
| Low | McMinnville 2021 Urban Growth Boundary | Rivers & Streams |
| Moderate | Study Area (1.5 Miles) | |
| High/Severe | Tax Lots | |

Miles 0 0.25 0.5 1 1.5 2

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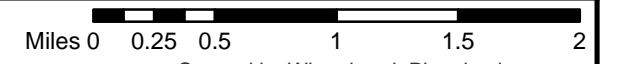


V-1

This map was created for informational purposes for the City of McMinnville and is not suitable for site specific legal, engineering, or surveying purposes.

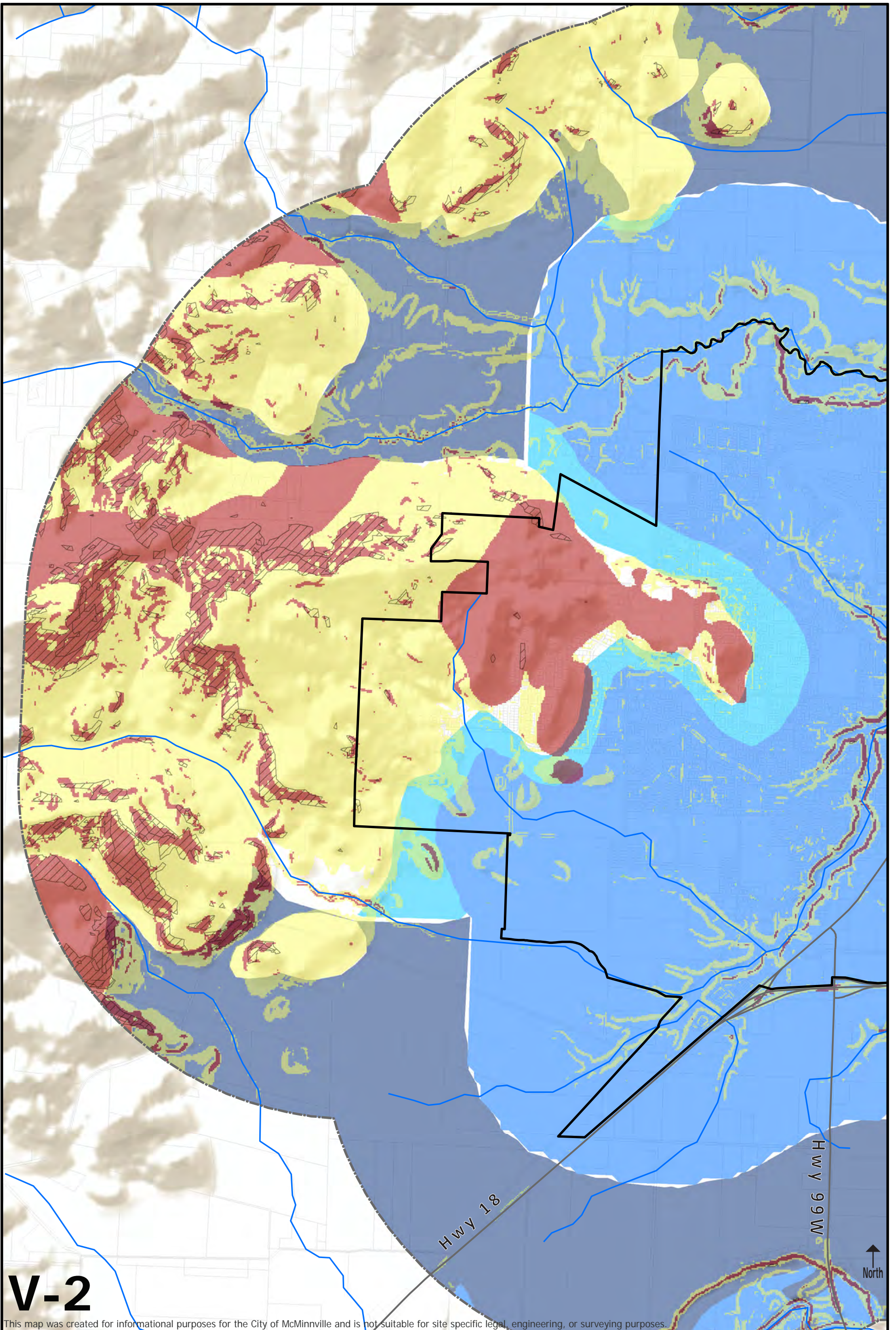
**McMinnville
Landslide, Liquefaction,
& Flood Hazards**

| | | | |
|-----------------------|--------------------------|--|------------------|
| Landslide Risk | Liquefaction Risk | Flood Hazards | Major Roads |
| Moderate Risk | Low Risk | McMinnville 2021 Urban Growth Boundary | Rivers & Streams |
| High Risk | Moderate Risk | Study Area (1.5 Miles) | |
| | High Risk | Tax Lots | |



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Last Revised: June 23, 2021



V-2

This map was created for informational purposes for the City of McMinnville and is not suitable for site specific legal, engineering, or surveying purposes.

McMinnville WEST HILLS
Geologic Hazards:
Steep Slopes, Landslide
& Liquefaction

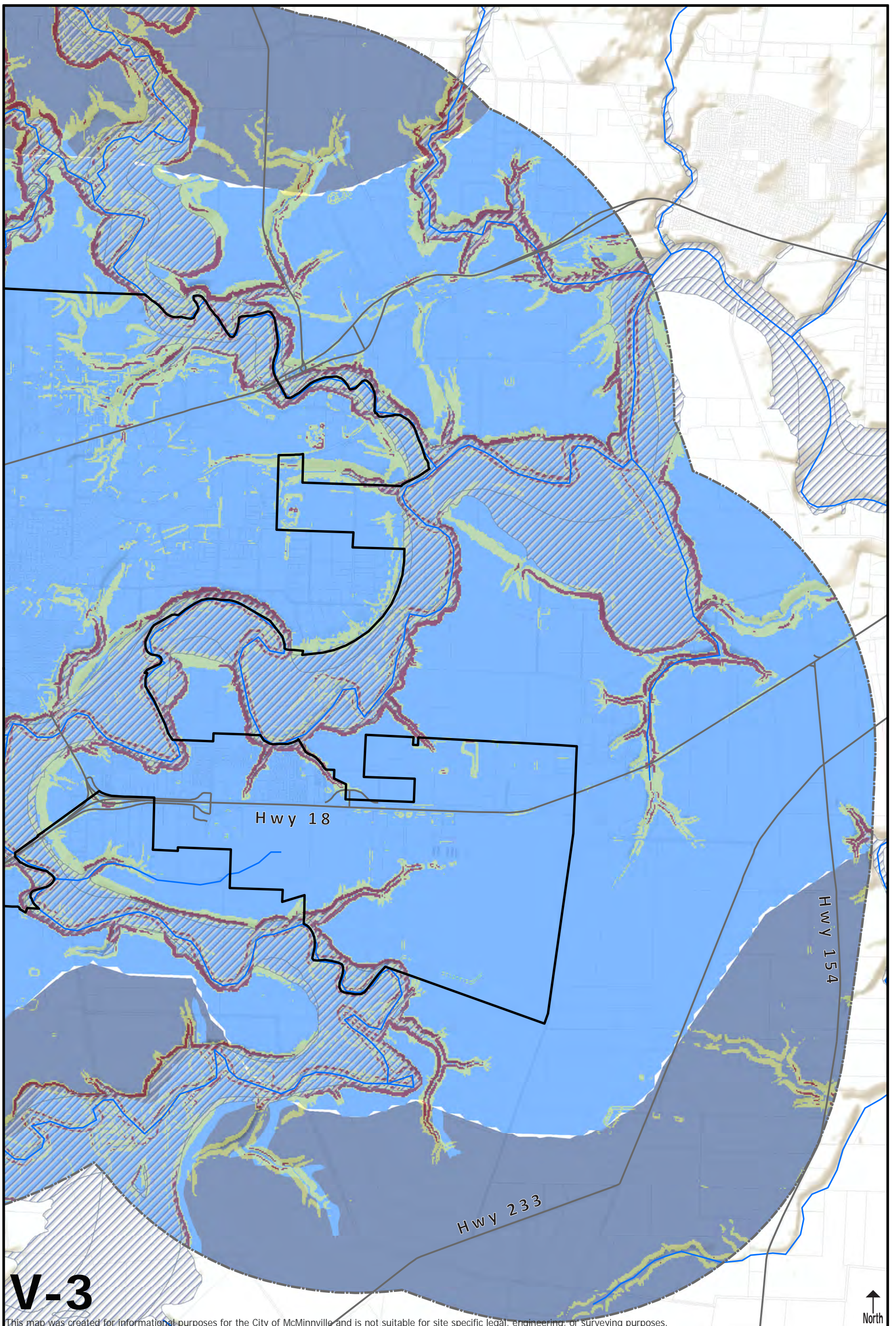
- | | | | |
|-----------------------|--------------------------|--|------------------|
| Landslide Risk | Liquefaction Risk | Steep Slopes (>25%) | Tax Lots |
| Moderate Risk | Low Risk | McMinnville 2021 Urban Growth Boundary | Major Roads |
| High Risk | High Risk | Study Area (1.5 Miles) | Rivers & Streams |

Miles 0.125 0.25 0.5 0.75 1

Created by Winterbrook Planning in coordination with the City of McMinnville



Last Revised: June 23, 2021



V-3

This map was created for informational purposes for the City of McMinnville and is not suitable for site specific legal, engineering, or surveying purposes.

**McMinnville
EAST VALLEY
Landslide, Liquefaction,
& Flood Hazards**

- | | | | |
|-----------------------|--------------------------|--|------------------|
| Landslide Risk | Liquefaction Risk | Flood Hazard | Tax Lots |
| Moderate Risk | Low Risk | McMinnville 2021 Urban Growth Boundary | Major Roads |
| High Risk | Moderate Risk | Study Area (1.5 Miles) | Rivers & Streams |
| | High Risk | | |

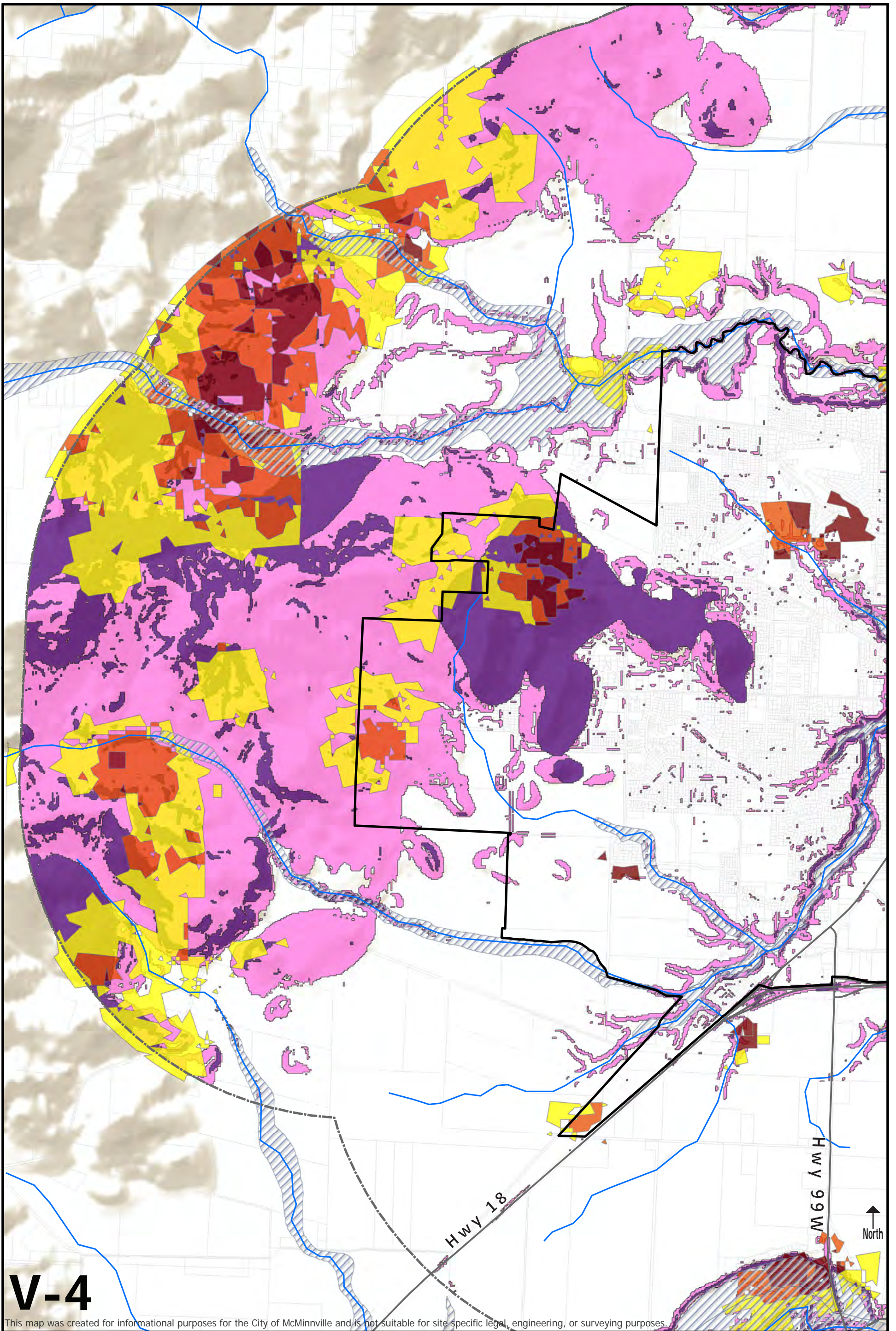
Miles 0.125 0.25 0.5 0.75 1

Created by Winterbrook Planning in coordination with the City of McMinnville



Last Revised: June 23, 2021





V-4

This map was created for informational purposes for the City of McMinnville and is not suitable for site specific legal, engineering, or surveying purposes.

McMinnville WEST HILLS
Wildfire Impacts to People & Property, Landslide Risk, & Flood Hazards

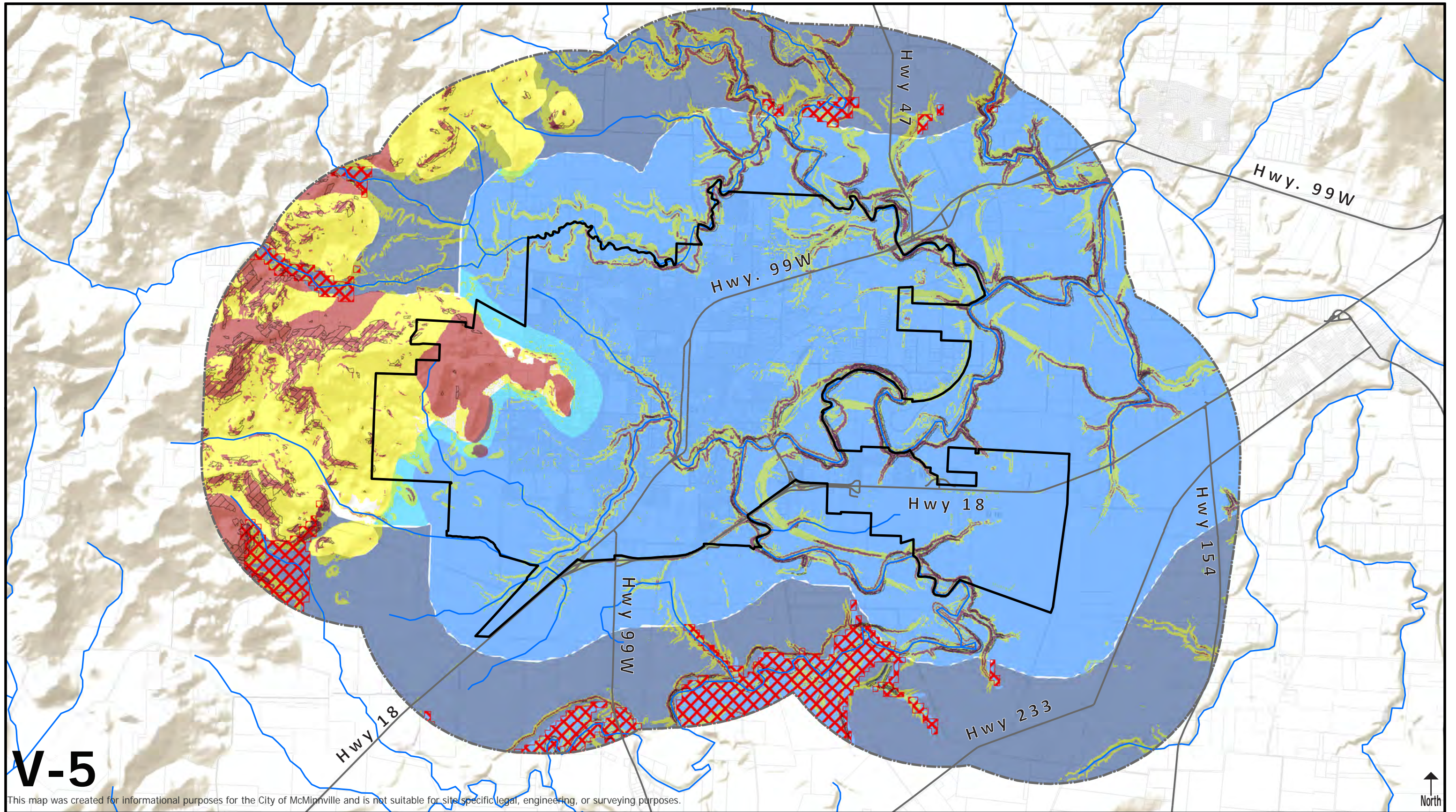
- | | | | |
|----------------------|-----------------------|--|------------------|
| Wildfire Risk | Landslide Risk | Flood Hazard | Tax Lots |
| Low | Moderate Risk | McMinnville 2021 Urban Growth Boundary | Major Roads |
| Moderate | High Risk | Study Area (1.5 Miles) | Rivers & Streams |
| High | | | |

Miles 0.125 0.25 0.5 0.75 1

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Last Revised: June 23, 2021



V-5

This map was created for informational purposes for the City of McMinnville and is not suitable for site specific legal, engineering, or surveying purposes.

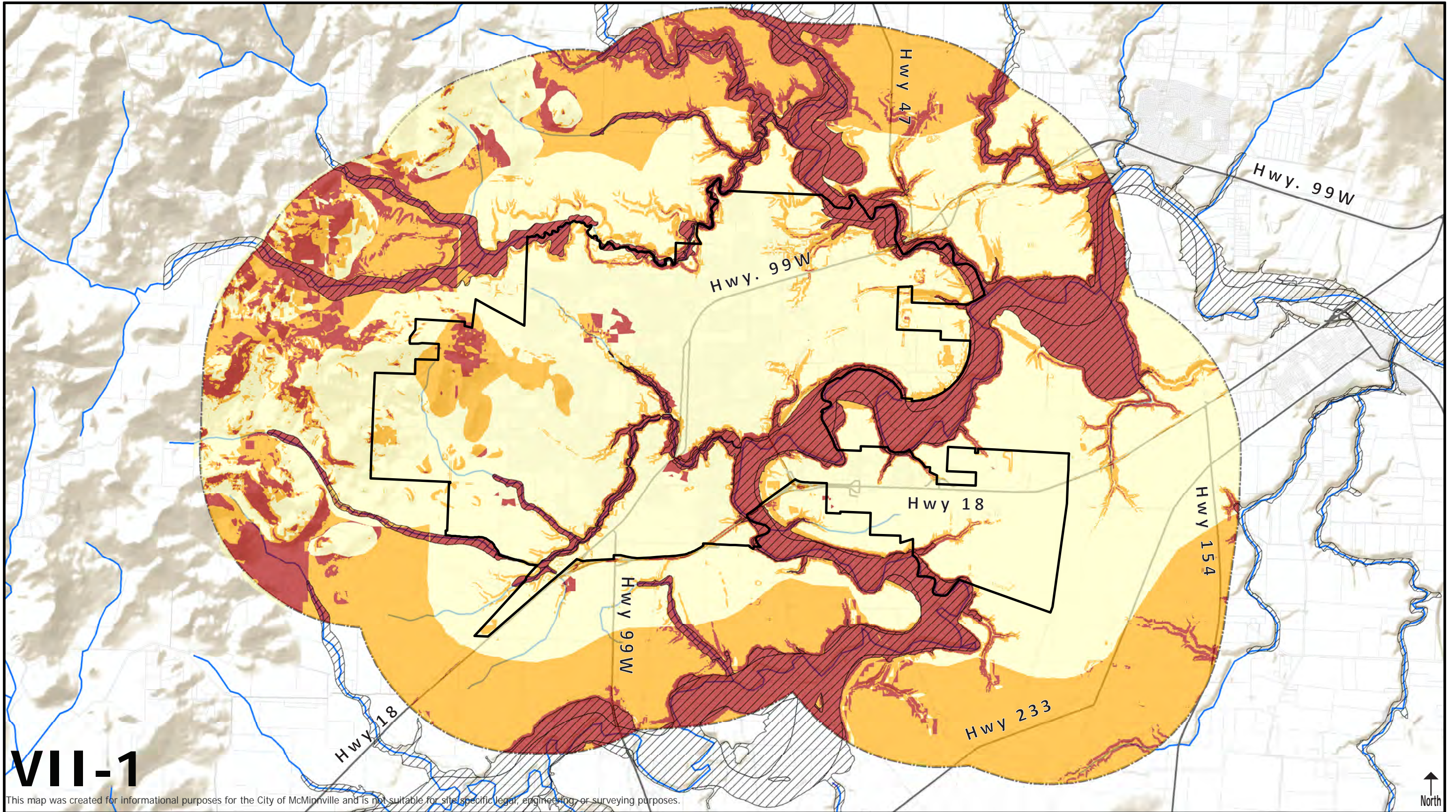
**McMinnville Composite Map:
Landslide, Liquefaction, Subduction
Shaking & Steep Slopes**

- | | | | |
|-----------------------|--------------------------|--|------------------|
| Landslide Risk | Liquefaction Risk | Severe Shaking | Tax Lots |
| Moderate Risk | Low Risk | Steep Slopes (>25%) | Major Roads |
| High Risk | Moderate Risk | McMinnville 2021 Urban Growth Boundary | Rivers & Streams |
| | High Risk | Study Area (1.5 Miles) | |

Miles 0 0.25 0.5 1 1.5 2

Created by Winterbrook Planning in coordination with the City of McMinnville

City of McMinnville
WINTERBROOK
Last Revised: June 23, 2021



VII-1

This map was created for informational purposes for the City of McMinnville and is not suitable for site specific legal, engineering, or surveying purposes.

McMinnville Proposed Natural Hazard Overlay

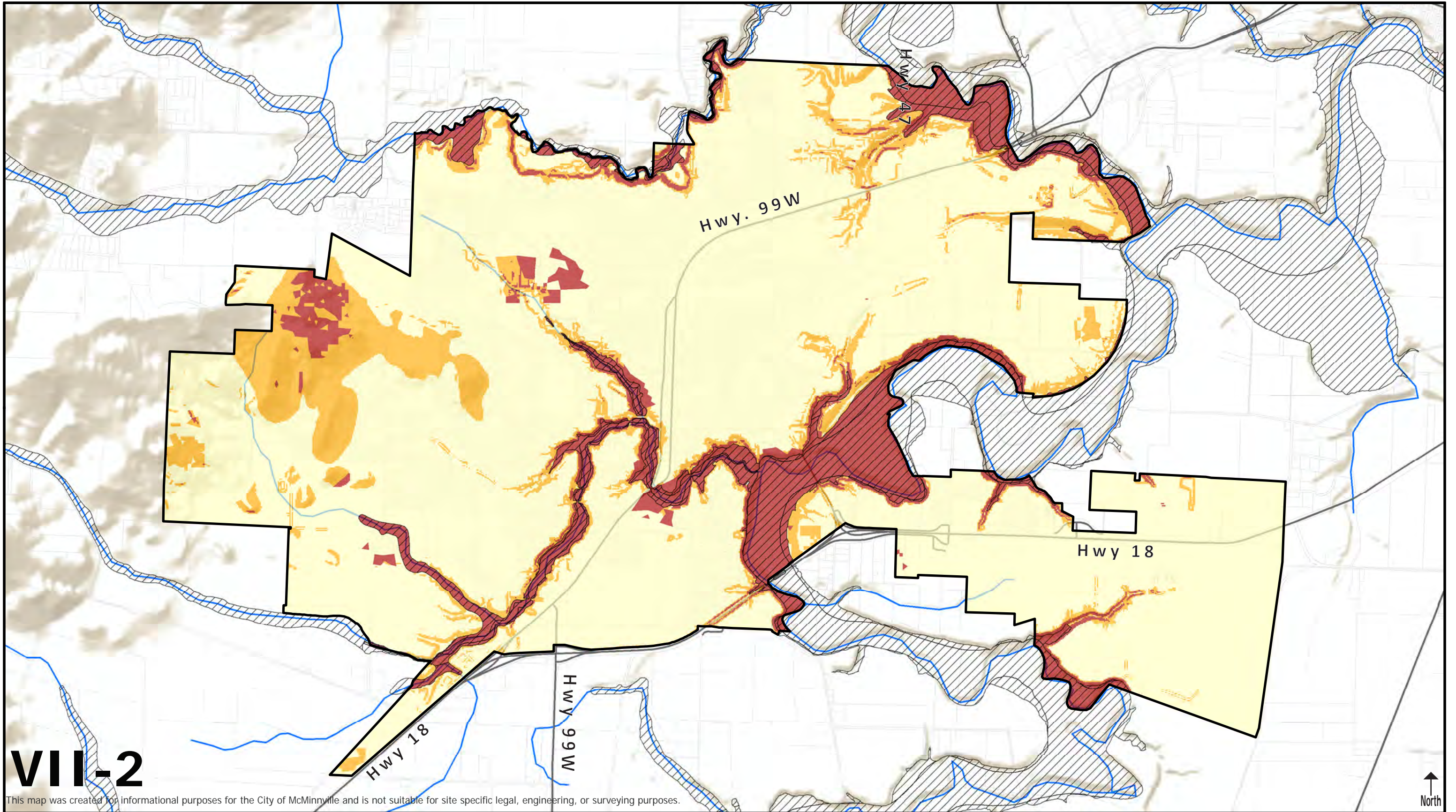
- | | | |
|--------------------|--|------------------|
| Subdistrict | McMinnville 2021 Urban Growth Boundary | Major Roads |
| Protection (NH-P) | Study Area (1.5 Miles) | Rivers & Streams |
| Mitigation (NH-M) | Flood Hazards | Tax Lots |
| No Subdistrict | | |

Miles 0 0.25 0.5 1 1.5 2

Created by Winterbrook Planning in coordination with the City of McMinnville



 Last Revised: June 24, 2021



VII-2

This map was created for informational purposes for the City of McMinnville and is not suitable for site specific legal, engineering, or surveying purposes.

McMinnville Proposed Natural Hazard Overlay - UGB

- | | | |
|--------------------|--|------------------|
| Subdistrict | McMinnville 2021 Urban Growth Boundary | Rivers & Streams |
| Protection (NH-P) | Major Roads | Tax Lots |
| Mitigation (NH-M) | Flood Hazards | |
| No Subdistrict | | |

Miles 0 0.15 0.3 0.6 0.9 1.2

Created by Winterbrook Planning in coordination with the City of McMinnville

City of McMinnville

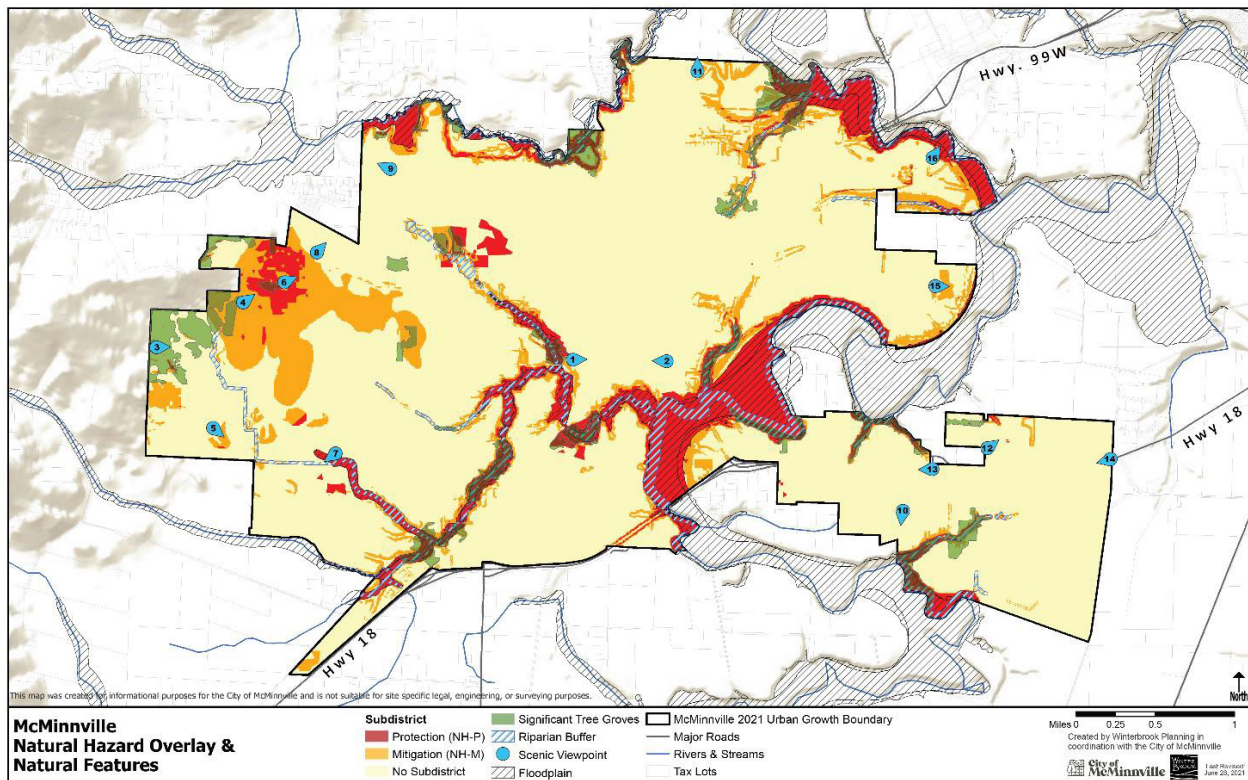

 Last Revised: June 24, 2021

PROPOSED AMENDMENTS TO THE MCMINNVILLE COMPREHENSIVE PLAN, VOLUME II

This entire chapter is new.

CHAPTER XI
NATURAL FEATURES

GOAL XI 1: PROTECT LIFE AND PROPERTY FROM INVENTORIED NATURAL HAZARDS, INCLUDING FLOODING, GEOLOGICAL AND WILDFIRE HAZARDS.



NATURAL HAZARDS

Multi Hazards

Policies:

- 197.00 *The City of McMinnville shall adopt and maintain a Natural Hazards Inventory as part of the McMinnville Comprehensive Plan (Volume I). The inventory shall include maps and text that identify the location, type and risk level for three types of natural hazards: geological hazards (including steep slopes, earthquakes and landslides), flood hazards (land within the 100-year floodplain), and wildfire hazards within the UGB).*
- 197.10 *The City of McMinnville shall apply public works construction standards, seismic building codes, and fire and life safety codes wherever natural hazards are identified in the Natural Hazards Inventory – including limited, moderate, and high combined risk subareas described the Natural Hazards Inventory.*
- 197.20 *The City of McMinnville shall establish a Natural Features (NF) overlay comprehensive plan designation to manage the cumulative effects of inventoried natural hazards in “moderate and high combined risk subareas” as described in Tables VII.1 and VII.2 of the Natural Hazards Inventory.*
- 197.30 *The NH overlay plan designation shall be implemented by two subdistricts based on cumulative ranking criteria found in Tables VII.1 and VII.2 of the Natural Hazards Inventory:*
1. ***The Natural Hazards Mitigation Subdistrict (NH-M).*** *The NH-M is intended to mitigate hazard impacts based on objective development standards for each applicable hazard type and the recommendations of required site-specific hazard studies.*
 2. ***The Natural Hazards Protection Subdistrict (NH-P).*** *The NH-P Subdistrict is intended to prohibit most types of development and may allow for residential density transfer. Where development is allowed it shall be subject to objective development standards for each applicable hazard type and the recommendations of required site-specific hazard studies.*
- 197.40 *The NH-M and NH-P Subdistricts shall include objective development standards for each type of natural hazard identified in the Natural Hazards Inventory, including landslides, earthquakes (liquefaction and shaking), floodplains, and wildfire hazards. Floodplains shall be protected by the underlying F-P Flood Hazard zone and the NH-P Subdistrict.*
1. *Maps showing the location and severity of each type of hazard in each subdistrict are available for public review and impacts on individual properties can be determined by city staff via the City’s GIS database.*

2. *In cases where hazard-specific development standards overlap, the more restrictive standard shall apply.*
- 3.
- 197.60 *Based on objective development standards and required hazard studies, the City of McMinnville may impose conditions of land use approval to protect life and property and mitigate natural hazard impacts in natural hazard subareas. Such conditions may include but are not limited to, conservation easements or dedication of hazard areas to the City.*
- 197.60 *Land division applications shall not create a lot that lacks sufficient buildable area to meet the minimum lot size and development standards applicable in the underlying zoning district.*
- 197.70 *New residential, commercial, and industrial construction shall be limited within the NH-P Subdistrict with the following exceptions:*
 1. *Public facilities and environmental restoration projects may be permitted under objective development standards.*
 2. *Residential density transfer from land within the NH-P Subdistrict to contiguous property under the same ownership that is outside both the floodplain and any applicable Natural Resource or Natural Hazard Subdistrict may be allowed.*
 3. *The maximum density allowed in the transfer area shall be the maximum density allowed in the next higher residential zoning district. For example, density transfer from the NH-P land with an underlying R1 zone to land outside the Natural Hazards Overlay (NH-P and NH-M) shall be capped at the density allowed in the R2 zone.*
 4. *In situations where density transfer is not feasible, a maximum of one dwelling unit per 2.5 acres may be allowed on land zoned for residential use, consistent with the recommendations of a geotechnical engineering study and any conditions required by the review authority.*
- 197.80 *In cases where the application of NH-P provisions would prohibit all reasonable economic use of an existing tract of land under common ownership, the City may grant an exception to allow a use permitted in the underlying zoning district that is not permitted in the NH-P Subdistrict. In making this decision, the applicant and City must:*
 1. *Consider first whether the exception provisions of Policy 197.70 would relieve the hardship;*
 2. *Consider potential uses that are allowed in the NH-P Subdistrict that could provide reasonable economic value;*
 3. *Consider alternative development layouts and land use intensity that minimize impacts from natural hazards on people and property and other values associated with natural hazard areas;*
 4. *Limit the intensity of the allowed land use to the minimum necessary to retain reasonable economic value of the subject tract; and*

5. *Meet all applicable development standards that apply to natural hazards in the NH-P zone.*

197.90 *The City of McMinnville shall coordinate with Yamhill County to apply McMinnville Comprehensive Plan Chapter XI Natural Features Policies to unincorporated land within the Urban Growth Boundary, including the application of the NH overlay zone (the NH-M and NH-S subdistricts) and related development standards. In cases of conflict with state law governing farm and forest land, state law will prevail over the NH overlay zone standards. For example, agricultural and forest uses allowed in Agricultural and Forest zones shall continue to be allowed; and the more restrictive fire mitigation standards in the County's Forest zones will prevail over the less restrictive City fire mitigation standards.*

197.100 *The City of McMinnville shall coordinate with the Oregon Department of Geology and Mineral Industries (DOGAMI), the Department of Land Conservation and Development (DLCD), the McMinnville Fire Department, and Yamhill County in updates of the Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan, the McMinnville Addendum to County NHMP, and the Yamhill County Community Wildfire Protection Plan. Updates to these plans will be considered in future updates to Chapter XI of the McMinnville Comprehensive Plan.*

197.110 *The City of McMinnville shall coordinate with the Greater Yamhill Watershed Council to facilitate watershed restoration and improvement projects in natural hazard areas such as floodplains and slide hazard areas. Shared natural hazard mitigation goals include: (1) removal of invasive vegetation species (that increase fuel for wildfires and clog waterways) and replacement with native species that reduce erosion, are more fire resistant and are less likely to clog waterways; and (2) restoration and enhancement of wetlands that provide flood control.*

197.120 *Tree removal and major pruning within the Floodplain Zone, the NH-M and NH- P Subdistricts shall be limited to minimize erosion and landslide potential and to maintain water quality*

Geological Hazards

Geological hazards appear on the McMinnville Natural Hazards Inventory and include:

1. *Slopes of 25% or more;*
2. *Moderate, high and severe risk earthquake (liquefaction and shaking) risk areas; and*
3. *Moderate and high-risk landslide hazard areas.*

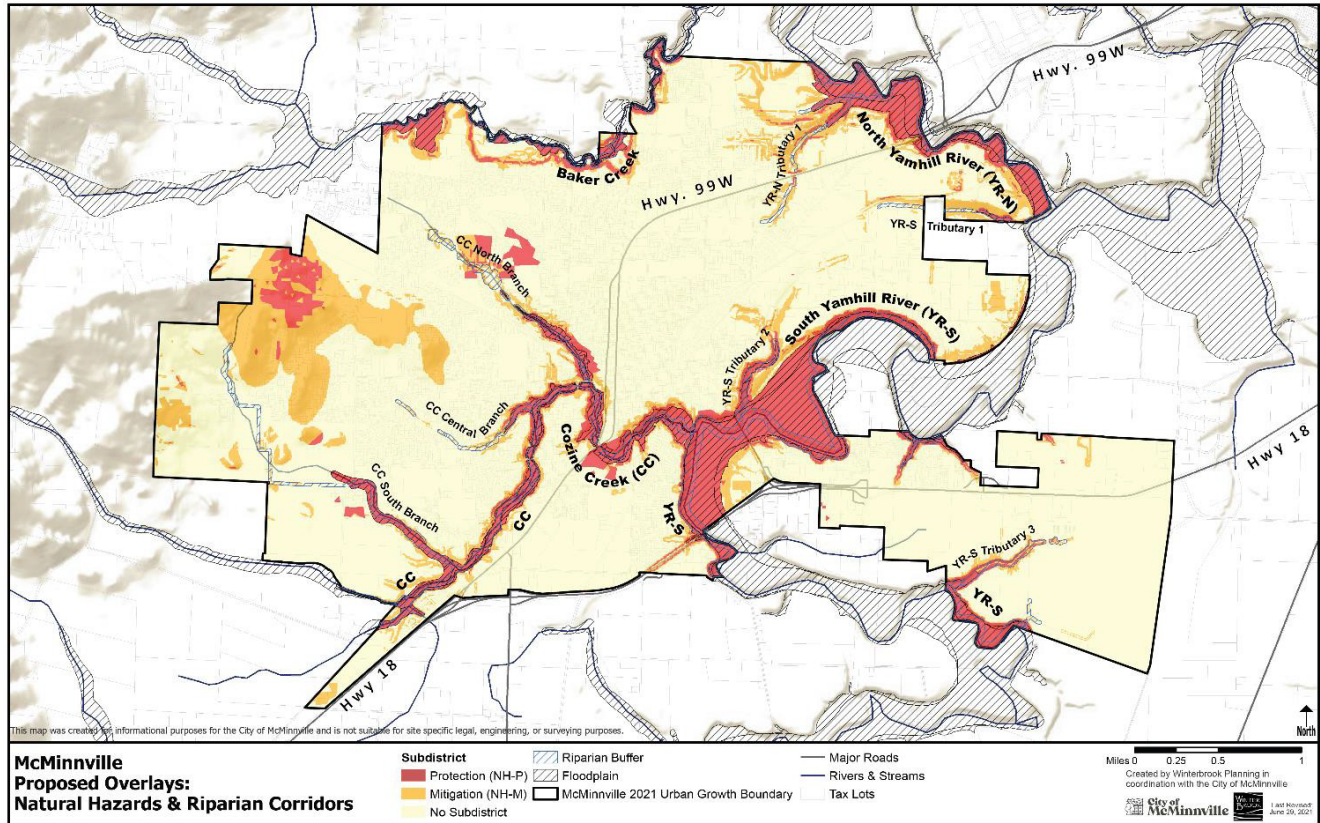
Policies:

198.10 *The NH-P and NH-M Subdistricts shall apply to subareas with geological hazards as shown on the Natural Hazards Inventory. Specific geological*

hazards found in each subdistrict are determined by referencing the McMinnville Natural Hazards Inventory and may be determined for individual properties by referencing the City's GIS database.

- 198.20 *Residential and commercial construction in areas with moderate or high geological risk hazards – as indicated on the Natural Hazards Inventory – shall meet the seismic and slope stability provisions of the Oregon State Building Codes. The Building Official may require a geotechnical engineering study prior to approval of construction.*
- 198.30 *The City of McMinnville shall require erosion control measures prior to grading or construction in subareas with:*
1. *Slopes of 15% or greater, and*
 2. *Landslide hazards in the NH-M and NH-P Subdistricts.*
- 198.40 *The City of McMinnville shall require geological reconnaissance studies with the submission of land development applications where geological hazards are present within the NH-M and NH-P Subdistricts. The recommendations of the geological reconnaissance study shall become conditions of land use approval unless specifically exempted or modified by the review authority.*
- 198.50 *Where recommended in a required geological reconnaissance study – or where determined necessary by the City Engineer or Building Official in moderate risk landslide hazard areas that are not included in the NH-M Subdistrict – a geotechnical engineering study may be required prior to grading, land development or construction.*
- 198.60 *The City of McMinnville shall retain the services of a qualified geologist or geological engineer to review geological studies prepared for land use applicants.*
1. *The City Engineer shall determine whether a second professional opinion is required.*
 2. *The costs of peer review shall be borne by the applicant.*
- 198.70 *The City shall consider adopting standards for public street and utility construction to moderate or higher geological hazard areas.*
- 198.80 *Because trees contribute to slope stability and reduce erosion, tree removal shall be limited in the NH-M Subdistricts.*

Flood Hazards

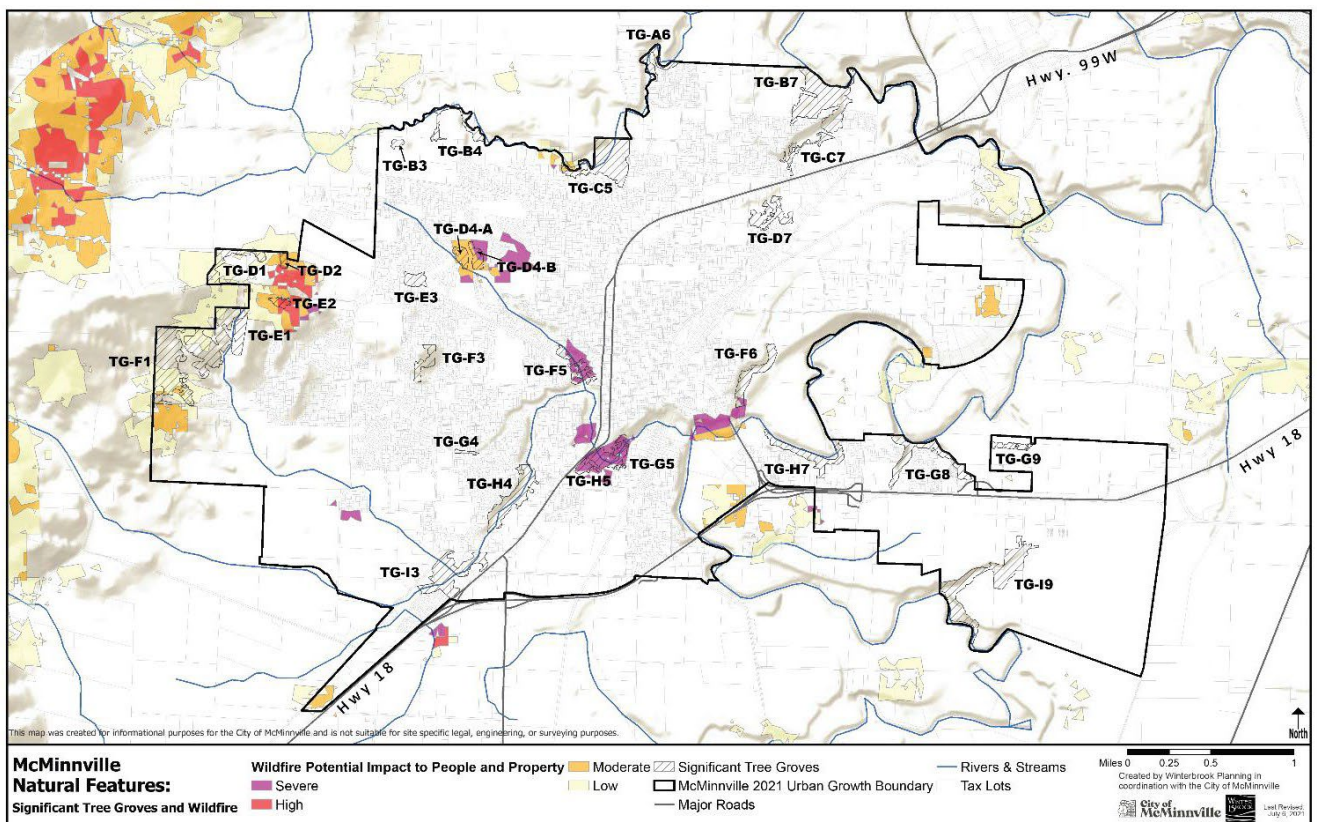


Policies

- 199.00 *Flood hazards areas are located within the designated 100-year floodplain. The City of McMinnville will continue to prohibit most types of development within the 100-year floodplain consistent with the City's F-P Flood Area Zone. Most significant riparian corridors are also located in the F-P Zone.*
- 199.10 *Land within the F-P Zone is protected by applicable NH-P Subdistrict standards. Natural geological and wildfire hazards associated with the 100-year floodplain, including but not limited to landslide and wildfire hazard areas, are addressed in NH-P Subdistrict development standards.*
- 199.20 *The City of McMinnville is committed to continued participation in the National Flood Insurance Program (NFIP) through the enforcement of local floodplain management regulations.*
- 199.30 *The City of McMinnville will work with the Federal Emergency Management Agency (FEMA) to update Flood Insurance Rate Maps (FIRM). The City will request Oregon Department of Geology and Mineral Industries (DOGAMI) debris flow and lidar data be included in FIRM updates.*

- 199.40 *The City of McMinnville will develop and maintain GIS maps of critical facilities identified in the McMinnville NHMP for all structures and residential development and commercial buildings within the 100-year and 500-year floodplains.*
- 199.50 *Because wetlands serve an important flood control function, wetland fill and removal shall not be permitted within the 100-year floodplain unless there is no reasonable alternative for a planned public works project.*
- 199.60 *The City of McMinnville will coordinate with the Greater Yamhill Watershed Council (or its affiliates) regarding stream and river restoration and enhancements projects to restore native vegetation, improve bank stability and improve water quality.*
- 199.70 *Because trees and vegetation reduce streambank failure and improve water quality, tree removal shall be limited in F-P Zone.*

Wildfire Hazards



Policies

- 200.00 *Moderate, high and severe wildfire hazard areas appear on the Natural Hazards Inventory and are generally associated with the West Hills and*

vegetated floodplains. Where wildfire hazards subareas overlap with geological or floodplain hazards, they may be subject to NH-P or NH-M Subdistrict requirements, consistent with the ranking criteria found in the Natural Hazards Inventory and as shown on Natural Hazards Inventory Map VII-1.

- 200.10 *City staff shall coordinate with the McMinnville Fire Department and RFPD to encourage fire safety planning and education – especially in Wildfire Urban Interface zones and designated Fire Reduction Areas in the West Hills. The City of McMinnville shall continue to coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.*
- 200.20 *Residential, commercial, and industrial development shall be limited in wildfire risk subareas in the NH-P Subdistrict; However, exceptions may be permitted pursuant to Natural Hazard Policies 197.70 and 197.80.*
- 200.30 *Development density in moderate to high wildfire risk areas in the NH-M Subdistrict may be limited where necessary to provide adequate space for fuel breaks in areas that are threatened by two or more natural hazards.*
- 200.40 *In the NH-P and NH-M Subdistricts with identified wildfire hazards, applicants for land divisions and new development (excluding home remodels or additions) shall prepare a Fire Prevention and Control Plan in coordination with the McMinnville Fire Department or RFPD. The plan shall be prepared by a certified arborist and shall consider necessary tree and vegetation removal, erosion control, and replacement of lost trees and vegetation with native, fire-resistant trees and vegetation.*
- 200.50 *The maximum density allowed within the NH-P Subdistrict shall be one unit per 2.5 acres or shall be subject to the density transfer provisions of Policy 197.70.*
- 200.60 *Based on the Fire Prevention and Control Plan, the following wildfire mitigation standards shall be met:*
1. *Installation and maintenance of at least a 40-foot fuel break around each new dwelling or structure.*
 2. *Where vegetation needs to be maintained for slope stability in a fuel break area, require plantings of fire-resistant or slow-burning plants. The City shall make a list of such plants available to the public.*
 3. *Provision of one or more than one ingress/egress route or road widths wide enough to accommodate incoming fire apparatus and evacuating residents simultaneously in an emergency situation.*
 4. *Roofs and siding with fire-resistant materials. Wood shake or shingle roofs are not allowed.*
 5. *Design road placement to function as fire breaks in urban wildland*

interface developments.

6. *Chimneys of wood-burning devices to be equipped with spark arrester caps and/or screens.*
7. *Underground electrical distribution circuits if technically feasible.*
8. *Sprinkler systems in all dwelling units and occupied buildings.*

**PROPOSED AMENDMENTS TO THE MCMINNVILLE MUNICIPAL CITY CODE –
TITLE 17, ZONING ORDINANCE**

New proposed language is represented by **bold underline font**, deleted language is represented by ~~strikethrough font~~.

ZONING*

Chapters:

- 17.03 General Provisions
- 17.06 Definitions
- 17.09 Zone Classifications, Boundaries, and Maps
- 17.10 Area and Master Planning Process
- 17.11 Residential Design and Development Standards
- 17.12 R-1 Low-Density, 9000 SF Lot Residential Zone
- 17.15 R-2 Low-Density, 7000 SF Lot Residential Zone
- 17.18 R-3 Medium-Density, 6000 SF Lot Residential Zone
- 17.21 R-4 Medium, High-Density, 5000 SF Lot Residential Zone
- 17.22 R-5 High-Density, Multiple-Dwelling Residential Zone
- 17.24 O-R Office/Residential Zone
- 17.27 C-1 Neighborhood Business Zone
- 17.30 C-2 Travel Commercial Zone
- 17.33 C-3 General Commercial Zone
- 17.36 M-L Limited Light Industrial Zone
- 17.39 M-1 Light Industrial Zone
- 17.42 M-2 General Industrial Zone
- 17.45 AH Agricultural Holding
- 17.48 F-P Flood Plain Zone
- 17.49** **Natural Hazard Overlay Subdistricts**
- 17.50 Neighborhood Activity Center Overlay District
- 17.51 Planned Development Overlay
- 17.52 Airport Overlay Zone
- 17.53 Land Division Standards
- 17.54 General Regulations
- 17.55 Wireless Communication Facilities
- 17.56 Large Format Commercial Development
- 17.57 Landscaping
- 17.58 Trees
- 17.59 Downtown Design Standards and Guidelines
- 17.60 Off-Street Parking and Loading
- 17.61 Solid Waste and Recycling Enclosure Plan

* Prior ordinance history: Ord. 3380 as amended by Ords. 3392, 3441, 3497, 3557, 3565, 3603, 3614, 3633, 3677, 3694, 3707, 3742, 3764, 3803, 3817, 3888, 3898, 3925, 3933, 3966, 3967, 3968, 3983, 3995, 4001, 4011, 4017, 4025, 4043, 4046, and 4066.

| | |
|--------------|---|
| <u>17.62</u> | <u>Signs</u> |
| <u>17.63</u> | <u>Nonconforming Uses</u> |
| <u>17.64</u> | <u>Marijuana Related Activities</u> |
| <u>17.65</u> | <u>Historic Preservation</u> |
| <u>17.66</u> | <u>City Center Housing Overlay Zone</u> |
| <u>17.67</u> | <u>Home Occupations</u> |
| <u>17.72</u> | <u>Applications and Review Process</u> |
| <u>17.74</u> | <u>Review Criteria</u> |

Chapter 17.48

F-P FLOOD AREA ZONE

Sections:

| | |
|-----------|-------------------------------|
| 17.48.005 | Purpose. |
| 17.48.010 | Established - Area Included. |
| 17.48.020 | Boundaries Indicated on Map. |
| 17.48.025 | Definitions. |
| 17.48.030 | Permitted Uses. |
| 17.48.040 | Conditional Uses. |
| 17.48.045 | Conditional Use Factors. |
| 17.48.060 | Use Limitations. |
| 17.48.070 | Use of Other Base Flood Data. |

17.48.005 Purpose. The purpose of a floodplain is to establish and regulate land uses in those areas designated as hazardous due to periodic flooding in order to protect the community from financial burdens through flood damage losses. Further, this zone is intended to protect natural floodways and drainage ways from encroachment by uses and/or indiscriminate land filling or diking which may adversely affect the overall stream and downstream flood levels, **wetland water quality or flood control values, tree canopy, native vegetation and water quality.** Finally, the floodplain zone shall set aside an area which shall, for the most part, be preserved in its natural state or farmed to provide open spaces, natural habitats, and recreational places. (Ord. 4128 (part), 1981; Ord. 3380 (part), 1968).

17.48.010 Established—Area Included. In accordance with Section 17.09.010, all property within the corporate limits of the City lying within Special Flood Hazard Areas (100-year flood) identified by the Federal Insurance Administration in the report entitled “The Flood Insurance Study for Yamhill County, Oregon and Incorporated Areas,” (effective date March 2, 2010), and accompanying Flood Insurance Rate Maps (FIRM) is declared to be flood area zone property and subject to the requirements of this Chapter. (Ord. 4921 §4A, 2010; Ord. 4128 (part), 1981; Ord. 3380 (part), 1968).

17.48.020 Boundaries Indicated on Map. The boundaries for the zone established by Section 17.48.010 shall be indicated on the McMinnville Zoning Map. (Ord. 4128 (part), 1981; Ord. 3380 (part), 1968).

17.48.025 Definitions. For the purpose of this section refer to Section 17.06.030 for Flood Area related definitions. (Ord. 4952 §1, 2012).

17.48.030 Permitted Uses. In an F-P zone, the following uses and their accessory uses are permitted (subject to the provisions of Section 17.48.060 **and Chapter 17.49 Natural Hazard Subdistricts**):

- A. Farming;
- B. Public park and recreation facility, not requiring the use of any structure;
- C. Sewage pump station. (Ord. 4684 §1, 1998; Ord. 4128 (part), 1981; Ord. 3380 (part), 1968).

17.48.040 Conditional Uses. In an F-P zone, the following uses and their accessory uses may be permitted, subject to the provisions of Section 17.47, Section 17.48.045, Section 17.4 and Chapters **17.49**, 17.72 and 17.74:

- A. Boat landing and launching facility;
- B. Open land recreation facility requiring the use of any structure;
- C. Removal of sand, gravel, topsoil, or rock;
- D. Landfill or diked land, including culvert and bridge installations, subject to the following procedures:
 - 1. Preliminary submittal of the proposal shall be made to the Planning Department, which shall check the proposal to ensure its compliance to the ordinance. Said proposal shall then be submitted to the Planning Commission.
 - 2. The City shall provide written notice to the City Recorder's office in adjacent communities, Yamhill County, and the Oregon Department of Land Conservation and Development prior to any alteration or relocation of a watercourse (i.e., stream channel), and shall submit a copy of that notification to the Federal Insurance Administration.
 - 3. The Planning Department shall prescribe the form and information required for applications made for any conditional use listed in this subsection. No application shall be accepted unless it complies with such requirements and is verified as to the correctness thereto. There shall be included, as a part of the application, an accurate map. Such plans shall be in triplicate, drawn at a scale of not larger than one inch equals fifty feet nor smaller than one inch equals five hundred feet, and shall show:
 - a. 100-year flood projection elevation on the subject site. State source of information.
 - b. Property boundaries and dimensions.
 - c. Ground elevations shown by contour lines of not less than two-foot vertical intervals. State source of information.
 - d. Existing and proposed structures.
 - e. Dimensions and elevations of existing and/or proposed fill.

- f. Location of stream channel in relationship to items “a” through “e” above.
 - g. A typical valley cross-section showing the channel of the stream, elevation of land areas adjoining each side of the channel, cross-sectional areas to be occupied by the proposed fill and high-water information.
 - h. Profile showing the slope of the bottom of the channel or flow line of the stream, and the slope line of the proposed fill.
 - i. Specifications of fill material, grading, channel improvement or maintenance plans, dimensions, and restoration of completed project.
 - j. **The location of applicable natural hazard on or adjacent to the subject site.**
- E. Weapons Training Facility subject to the following conditions:
- 1. The property on which the facility is located must be owned or leased by a Federal, State, or local government agency for the exclusive use of public safety personnel engaged in firearms or other related training;
 - 2. The facility must be located no closer than 2,640 feet (one-half mile) to any land planned and zoned for residential use; and
 - 3. Only those firearms or weapons authorized by a government agency and utilized for law enforcement related purposes shall be allowed within the area approved for a weapon training facility. Possession of other firearms or weapons at a weapon training facility site shall be considered a violation of this ordinance.
- F. Wireless communications facilities, not to include antenna support structures and their associated facilities, subject to the provisions of Chapter 17.55 (Wireless Communications Facilities). (Ord. 4921 §4C, 2010; Ord. 4732, 2000; Ord. 4684 §2, 1998; Ord. 4559 §1, 1994; Ord. 4128 (part), 1981; Ord. 3380 (part), 1968).

17.48.045 Conditional Use Factors. The Planning Commission shall consider the following factors and special conditions when making a decision regarding a conditional use in the floodplain zone:

- A. Factors to be Considered:
- 1. The danger to life and property due to increased flood heights or velocities caused by any proposed fill.
 - 2. The danger that materials may be swept onto other lands or downstream to the injury of others.
 - 3. The importance to the community of the service provided by the proposed facility.
 - 4. The availability of alternative locations not subject to flooding.
 - 5. The compatibility of the proposed use with existing development and development anticipated in the foreseeable future.
 - 6. The relationship of the proposed use to the comprehensive plan and floodplain management program for the area.
 - 7. The compatibility of the proposed use with the potential of the site and the surrounding floodplain area for open space, natural habitats, and recreational places.

8. The impact of the proposed use on fish, wildlife habitat, **and water quality.**
 9. **The danger to life and property from landslides, wildfire or earthquakes due to excavation, vegetation removal and construction of the proposed use.**
 10. Such other factors which are relevant to the purposes of this section.
- B. Special Conditions. Upon consideration of the factors listed above and the purposes of this section, the Planning Commission may attach such conditions to the granting of a conditional use permit as it deems necessary to further the purposes of this portion of the zoning ordinance. The following such conditions, but not exclusively limited thereto, may be included:
1. Limitations on periods of use and operation, and upon the area to be filled and the elevation of the fill as well as to the kinds of material which may be so emplaced.
 2. Imposition of operational controls, sureties, and deed restrictions.
 3. Requirements for construction of channel modifications, dikes, levees, and other protective measures.
 4. Limitations on the removal or destruction of critical fish and wildlife habitat including any area of riparian vegetation. (Ord. 4128 (part), 1981; Ord. 3380 (part), 1968).
 5. **Limitations imposed by applicable natural hazard overlay zones per Chapter 17.49.**

[17.48.050 Signs. Moved to Chapter 17.62 (Signs), by Ord. 4900 November 5, 2008.]

17.48.060 Use Limitations. In an F-P zone, the following limitations shall apply:

- A. No residence shall be constructed;
- B. A lot shall not be less than one acre in area;
- C. Within the floodway and flood fringe, no encroachment will be allowed which causes any increase in the flood height or which would result in hazardous velocities (see floodway schematic). To demonstrate compliance with this requirement, the applicant shall submit an engineering certification stating the proposed development will not impact the pre-project base floodway and flood fringe elevations. The certification shall be signed and sealed by a professional engineer and be supported by the appropriate technical data and studies, which are typically based upon the standard step-backwater computer model utilized to develop the 100-year floodway and flood fringe shown on the appropriate Federal Insurance Rate Map (FIRM) and tabulated in the adopted Flood Insurance Study. (Ord. 4921 §4D, 2010; Ord. 4684 §3, 1998; Ord. 4128 (part), 1981; Ord. 3380 (part), 1968).

17.48.070 Use of Other Base Flood Data. When base flood elevation data has not been provided (FIRM zones A), the applicant shall provide alternative base flood elevation as available from a Federal, State, or other source in order to comply with this chapter. (Ord. 4921 §4E, 2010)

This whole chapter is new to the McMinnville Municipal Code

Chapter 17.49

NATURAL HAZARD OVERLAY SUBDISTRICTS

Sections:

- 17.49.00** Natural Hazard Subdistricts Generally.
- 17.49.10** Definitions
- 17.49.20** Purpose and Intent of the Natural Hazard Subdistricts.
- 17.49.30** Applicability and General Provisions.
- 17.49.40** Permitted and Conditional Uses.
- 17.49.50** Review Procedures.
- 17.49.60** Natural Hazard Subdistrict Application Requirements.
- 17.49.70** Required Natural Hazard Mitigation Reports.
- 17.49.80** Decision Options and Conditions
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Natural Hazards – Mitigation (NH-M) Subdistrict

- 17.49.100** Natural Hazards - Mitigation (NH-M) Subdistrict
- 17.49.110** Earthquake Mitigation Standards.
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- 17.49.140** Reserved for Future Use.

Natural Hazard – Protection (NH-P) Subdistrict

- 17.49.150** Natural Hazards – Protection (NH-P) Protection Subdistrict
- 17.49.160** Use Limitations
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- 17.49.180** Earthquake Mitigation Standards
- 17.49.190** Steep Slope and Landside Mitigation Standards
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17.49.00 Natural Hazard Subdistricts Generally. Natural Hazard Subdistricts (NH Subdistricts) implement the Natural Hazard Policies of the McMinnville Comprehensive Plan and are intended to protect life and property from inventoried natural hazard areas pursuant to Statewide Planning Goal 7 – Natural Hazards.

- A. NH Subdistricts are based on adopted natural hazard inventories – which include maps showing significant resource sites and supporting reports documenting the criteria and methods used to determine local resource site significance.
- B. NH Subdistricts implement McMinnville Comprehensive Plan Chapter XI Natural Features policies related to Natural Hazards.
- C. NH Subdistrict boundaries appear on the official City Zoning Map.
- D. NH Subdistrict standards apply in addition to standards of the underlying base zone. In cases of conflict, the more restrictive NH Subdistrict standards control.

17.49.10 Definitions. The following definitions apply within the NH-P and NH-M Subdistricts.

- A. **Landmark and Significant Trees.** Please see definitions in Chapter 17.58 Trees.
- B. **Native Plants.** “Native plant species” are those listed on the Portland Plant List, which is incorporated by reference into this chapter.
- C. **Fire Resistant Plants.** Fire-resistant plants burn at a relatively low intensity, slow rates of spread and with short flame lengths.¹ In addition to listed species, fire-resistant tree and plant species may be determined based on the professional opinions of licensed landscape architects, certified arborists or foresters. Fire-resistant vegetation has the following characteristics:
 - 1. Growth with little or no accumulation of dead vegetation (either on the ground or standing upright).
 - 2. Non-resinous plants.
 - 3. Low volume of total vegetation (for example, a grass area as opposed to a forest or shrub-covered land).
 - 4. Plants with high live fuel moisture (plants that contain a large amount of water in comparison to their dry weight).
 - 5. Drought-tolerant plants (deeply rooted plants with thick, heavy leaves).
 - 6. Stands without ladder fuels (plants without small, fine branches and limbs between the ground and the canopy of overtopping shrubs and trees).
 - 7. Plants requiring little maintenance (slow-growing plants that, when maintained, require little care).

¹ A handbook entitled *Fire-resistant Landscape Plants for the Willamette Valley* (OSU Extension Service, 2015) provides a list of fire-resistant shrubs and plants applicable to the McMinnville area.

8. Plants with woody stems and branches that require prolonged heating to ignite.

Note: This list may be modified based on the professional opinions of licensed landscape architects, certified arborists or foresters.

- D. **Fuel Reduction Area.** An area where vegetation or material capable of allowing a fire to spread unchecked has been treated, cleared or modified to slow the rate and intensity of an advancing wildfire and to create an area for fire suppression operations. Establishment of a fuel reduction area does not include stripping the ground of all native vegetation.
- E. **Highly Flammable Trees and Plants.** Plant species that have characteristics which make them more volatile by encouraging easy ignition and the spread of fire through their foliage due to low moisture content, dense dry leaves, needles, grass-like leaves, or volatile resins and oils. Highly flammable trees and plants generally include coniferous and resinous trees and shrubs.² In addition to listed species, highly flammable tree and plant species may be determined based on the professional opinions of licensed landscape architects, certified arborists or foresters.
- F. **The McMinnville Natural Hazards Map.** A map that identifies earthquake, steep slope, landslide, wildfire, and flood hazard areas within the McMinnville Urban Growth Boundary. This generalized, composite map is based on the McMinnville Natural Hazards Inventory – adopted 2023.

17.49.20 Purpose and Intent of the Natural Hazard Subdistricts.

The purpose and intent of this chapter are to comply with the McMinnville Comprehensive Plan, minimize the cumulative risks associated with inventoried natural hazards, while allowing reasonable economic use of land within the McMinnville city limits.

- A. **Comprehensive Plan.** This chapter is designed to implement the Natural Hazard Policies found in Chapter XI Natural Features of the McMinnville Comprehensive Plan.
- B. **Reasonable Economic Use.** This chapter is intended to allow reasonable economic use of property while establishing standards to avoid or mitigate cumulative risks related to earthquake liquefaction and shaking hazards, steep slope and landslide hazards, wildfire hazards and flood hazards.

² Highly flammable trees and plants include at least the following:

- A. **Trees (including but not limited to):** Acacia (*Acacia* sp.); Arborvitae (*Thuja* sp.); Cedar (*Cedrus* sp.); Cedar/Cypress (*Chamaecyparis* sp.); Cypress (*Cupressus* sp.); Douglas fir (*Pseudotsuga menziesii*); Fir (*Abies* sp.); Hemlock (*Tsuga* sp.); Juniper (*Juniperus* sp.); Pine (*Pinus* sp.); Sequoia (*Sequoia* sp.); Spruce (*Picea* sp.); and Yew (*Taxus* sp.).
- B. **Shrubs (including but not limited to):** Blackberry (*Rubus armeniacus*); Juniper (*Juniperus* sp.); Laurel sumac (*Malosma laurina*); Oregon grape (*Mahonia aquifolium*); Rosemary (*Rosmarinus* sp.); Scotch broom (*Cytisus scoparius*); and Wild Lilac (*Ceanothus* sp.).
- C. **Grasses and Ground Cover (including but not limited to):** Dry annual grasses; Large bark mulch; and Pampas grass (*Cortaderia selloana*).

- C. Disclaimer.** The degree of Natural Hazard protection required by this chapter is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger hazard events can and will occur on rare occasions. Landslide risks may be increased by man-made or natural causes.
- 1. Areas impacted by other natural hazards may differ from those shown on the McMinnville Natural Hazards Map.**
 - 2. This Chapter does not imply that land outside the natural hazard areas or that uses permitted within such areas will be free from earthquake, steep slope, landslide, wildfire or flooding hazards. Nor does it imply that land outside of mapped hazard areas will be free from damage in a hazard event.**
 - 3. This Chapter shall not create liability on the part of the City of McMinnville, any officer or employee thereof, or the Federal Insurance Administration, for any hazard damages that result from reliance on this chapter, or any administrative decision lawfully made based on the provisions of this chapter.**
 - 4. Compliance with the minimum standards established by this chapter is not intended to relieve any private party from liability for the design or construction of development which causes damage or injury by aggravating an existing and known hazard.**

17.49.30 Applicability and General Provisions. The Natural Hazards Subdistricts apply to mapped Natural Hazards existing throughout the city limits. However, the cumulative severity of natural hazards varies by location. The provisions of this chapter apply to public and private development proposed within three areas – based on the cumulative hazards ranking found in the McMinnville Natural Hazards Inventory:

- A. The Area.** The following standards apply to public facilities, planned developments, land divisions, and new construction within the city limits:
- 1. Oregon Structural Specialty Code Seismic Standards.** All land within the McMinnville UGB is subject to moderate to severe earthquake shaking and liquefaction hazards. Oregon Structural Specialty Code and Residential Specialty Code seismic requirements shall apply to new construction in all city zones.
 - 2. City Erosion Control Standards.** City of McMinnville Storm Drainage Design and Construction Standards, including Erosion Control Standards, shall apply to development in all city zones. For development on sites where the prevailing slope is 10 percent or more, the erosion control plan shall be prepared by an engineer registered in the State of Oregon. The City Engineer may require special erosion control standards for development:
 - a. On slopes of 15% or greater;**
 - b. Within the Flood Area Zone; and**
 - c. Within the NH-M and NH-P Subdistricts; and**

- B. The Natural Hazard - Mitigation (NH-M) Subdistrict.** The NH-M Subdistrict includes land with cumulative earthquake, landslide and/or wildlife hazard risk that can be mitigated on-site based on the recommendations of required studies. The NH-M Subdistrict therefore requires geological site assessments, geotechnical studies and/or wildfire impact studies that include recommendations to mitigate earthquake, landslide and/or wildfire risks on development sites.
- C. The Natural Hazard – Protection (NH-P) Subdistrict.** The NH-P Subdistrict generally applies to the 100-year floodplain and areas with high cumulative earthquake, landslide, wildfire and/or flooding risks (1) that are more difficult to or cannot be effectively mitigated on-site, and/or (2) where the location and density of development may be limited. Where development is permitted, it shall occur consistent with the recommendations of geological, geotechnical and/or wildfire impact studies. The Flood Area (F-P) Zone includes additional standards to avoid and/or mitigate flood hazards.
- D. Determination of Site-Specific Natural Hazards and Mitigation Standards.** The presence and severity of natural hazard types (earthquake liquefaction, earthquake shaking, slide hazards and wildfire hazards) on specific properties is determined by referencing the McMinnville Natural Hazard Inventory GIS database.
1. Specific mitigation standards in this chapter depend on the presence (or absence) of specific natural hazards on a development site.
 2. For example, if a dwelling is proposed within a moderate-to-severe wildfire hazard area, the fuel reduction area standards required to mitigate wildfire hazards will apply.
- E. Overlap with Natural Resource Subdistricts.** Natural Hazard Subdistricts may overlap with Natural Resource Subdistricts, especially near riparian corridors and tree groves. Generally, the review authority shall seek to harmonize subdistrict standards that appear to conflict. However, where standards cannot be read together to achieve a consistent outcome:
1. The more restrictive standards apply, except that,
 2. NH-P and NH-M Subdistrict fuel reduction area standards shall prevail in cases of unavoidable conflict with the significant tree and vegetation standards of this chapter.
- F. Significant and Landmark Trees.** Significant and landmark trees stabilize landslide prone areas and reduce erosion.
1. Significant and landmark trees as defined in Chapter 17.58 Trees shall not be removed from land within Natural Hazard Subdistricts, except as provided in this chapter and Chapter 17.48 Trees.
 2. Removal of significant and landmark trees within NH-M and NH-P Subdistricts may be permitted when authorized as part of a land use application subject to the provisions of this chapter.

17.49.40 Permitted and Conditional Uses. The underlying zoning district determines permitted and conditional uses, subject to additional development limitations and standards required in the NH-M or NH-P Subdistricts.

A. **Conforming Uses.** Existing development within the NH-M or NH-P Subdistrict shall be considered conforming with respect to the development standards of the Subdistrict and may be expanded without meeting the substantive or procedural requirements of Chapter 17.63 Nonconforming Uses.

B. **Exempt Uses.** When performed under the direction of the City, and in compliance with the provisions of the City of McMinnville Construction Standards on file in the Engineering Division, the following shall be exempt from the provisions of this chapter:

1. Farming activities permitted in the underlying zone.
2. Public emergencies, including emergency repairs to public facilities.
3. Stream restoration and enhancement programs outside of wildfire hazard areas.
4. Invasive vegetation (not including significant or landmark trees) removal.
5. Additions of up to 50% of the habitable floor area of building(s) constructed before the effective date of this ordinance, or date of annexation within the city limits whichever is later, subject to applicable building safety code standards, including applicable seismic and wildfire safety standards.
6. Routine maintenance or replacement of existing public facilities projects.

17.49.50 Review Procedures. The natural hazard mitigation and protection standards in this chapter usually are applied in conjunction with a development application. Where a use is proposed within, or partially within, the NH-P or NH-M Subdistrict, the following procedures shall apply pursuant to Chapter 17.72 (Applications and Review Process).

A. **Permitted Uses.** Where a use is permitted outright in the applicable base zone (for example, residential, commercial, industrial or public uses), compliance with the standards of this chapter is determined by the Community Development or Planning Director, based on required natural hazard studies, as part of the site plan review process (if applicable), and prior to issuance of a building or construction permits.

B. **Land Divisions.** When land divisions are proposed pursuant to Chapter 17.53 Land Division Standards, compliance with the standards of this chapter is determined by the Planning Director, based on required natural hazard studies.

C. **Planned Developments.** When planned developments are proposed pursuant to Chapter 17.51 (Planned Development Overlay), compliance with the standards of this chapter is determined by the Planning Commission, based on required natural hazard studies.

- D. Density Transfer.** The Planning Commission shall review density transfer from land within the NH-P Subdistrict to buildable land, pursuant to Section 17.49.170 Density Transfer.
- E. Conditional Uses and Variances.**
1. Where a conditional use is proposed, compliance with the standards of this chapter is determined by the Planning Commission, based on required natural hazard studies, prior to issuance of building or construction permits.
 2. Where a variance is requested, compliance with the variance criteria in this chapter is determined by the Planning Commission, based in part on required natural hazard studies, prior to issuance of building or construction permits.
 3. **Public Facilities.** Construction of public facilities within natural hazard areas must follow the recommendations of required natural hazard studies.

17.49.60 Natural Hazard Subdistrict Application Requirements.

Development applications for all properties within the NH-M or NH-P Subdistricts shall accurately indicate the site-specific locations of specific types of natural hazard areas based on City GIS maps in relation to proposed development. City planning staff will assist the applicant by providing GIS maps showing city information sources listed below. Development applications within or partially within natural hazard subdistricts shall include:

- A. A site plan showing the proposed development on the site, drawn to a standard scale and including an illustrated scale for use in reductions.
- B. Topography showing 2-foot contour intervals and slopes of:
 1. 15 to 24.9 percent; and
 2. 25 percent and greater.
- C. The location of existing and proposed infrastructure necessary to serve the proposed development. Such infrastructure includes streets, driveways, water, sanitary sewer, and storm drainage.
- D. The potential hazard impact area showing land uses and tree cover within 200 feet of the subject property.
- E. A title block, north arrow, and bar scale.
- F. Date(s) of field check(s).
- G. A grading plan, if grading is to occur, showing existing and finished contours on the site, at two-foot contour intervals.
- H. Information sources, such as soil survey maps and applicable McMinnville Natural Hazard and Natural Resource inventory maps.
- I. Relevant City maps applicable to the site and impact area including the Zoning Map, natural hazard, and natural resource subdistrict maps.
- J. Aerial photos, including their date and scale.
- K. Depending on the type of natural hazard or natural resource identified on a proposed development site, the applicant shall be responsible for:
 1. Showing the precise location of each type of inventoried natural hazard or natural resource present on the development site;

2. Submitting required flooding, seismic, geological and/or wildfire hazard mitigation studies as prescribed in Section 17.49.060; and
 3. Demonstrating compliance with recommended mitigation measures pursuant to required hazard studies.
- L. The location and size of significant and landmark trees within 25 feet of any proposed disturbance area. If development is proposed within a wildfire area, the location and size of significant and landmark trees must be shown within 50 feet of the outer limits of above-ground construction.
- M. Any other submittal requirements identified for development in areas with specific types of natural hazards, as specified in this chapter.

17.49.70 Required Natural Hazard Mitigation Reports. Depending on the natural hazards present on a particular property, the applicant for land development shall be responsible for preparing one or more of the following studies within the NH-M and NH-P Subdistricts.

- A. Geological Site Assessment is an overview of existing geological conditions that includes recommendations for mitigation measures. The Site Assessment shall be completed and stamped by either a Certified Engineering Geologist or by a Licensed Civil Engineer, licensed in the Specialty of Geotechnical Engineering. At a minimum, the Geological Site Assessment shall include the following elements:
1. Relevant landslide and earthquake hazard information from the McMinnville Natural Hazards Inventory;
 2. A field investigation of the site and vicinity including a description of geologic hazards that may be present on the site;
 3. An analysis of the geological suitability of the site for proposed development;
 4. A description of any unusual or extreme geologic processes at work on the site, such as rapid erosion, landslide hazard, flood hazard, rockfall, subsidence, debris run-out, or other features;
 5. A description of any geologic hazards that may affect the proposed land use, including but not limited to slope stability, debris flow, flooding, topography, erosion hazard, shallow groundwater, springs, expansive soils, subsidence, fault rupture, landslide hazard, rockfall, debris run out, or any other geologic hazard discovered by the investigation;
 6. Identification of any areas of the site that should be avoided for human-occupied structures;
 7. An analysis of the feasibility of developing the site for the proposed land use(s);
 8. Identification of any mitigation measures needed to address any anticipated geologic problems; and
 9. Recommendations regarding the need for follow-up studies, such as engineering geotechnical reports, additional subsurface exploration, or more extensive soil reports.

- B. Geotechnical (Soils Engineering) Report is prepared and stamped by a Licensed Civil Engineer, licensed in the Specialty of Geotechnical Engineering by the Oregon State Board of Engineering Examiners. The Geotechnical Report usually makes specific recommendations to avoid or mitigate geological hazards. At a minimum, the Geotechnical Report shall include the following elements:**
- 1. Data regarding the nature, distribution and strength of existing soils on the site.**
 - 2. Analysis, conclusions, and recommendations for grading procedures.**
 - 3. Design standards for corrective measures, including buttress fill, when necessary.**
 - 4. A professional opinion on the adequacy of the development site for the intended use considering the proposed grading in relation to soils engineering factors, such as slope stability.**
 - 5. The location of proposed development and public facilities; and**
 - 6. Relevant information from the McMinnville Natural Hazards Inventory.**
- C. Wildfire Hazard Assessment and Mitigation Plan is prepared, in consultation with the McMinnville Fire Department, by a certified arborist or professional forester with experience in wildfire management. This plan must address wildfire mitigation standards in this chapter and may recommend additional fire safety standards. At a minimum, in addition to site plan requirements, the plan shall include:**
- 1. The location and dimensions of all existing and proposed structures, parking areas and driveways on the property.**
 - 2. The location, dimension, and grade of fire apparatus access roads and driveways serving all structures on the property.**
 - 3. The location and dimensions of all structures on adjoining properties located within 30 feet of a shared property line.**
 - 4. The location of all existing and proposed fire hydrants.**
 - 5. Site contours showing two foot intervals detailing elevation and slope.**
 - 6. A tree and vegetation management plan showing:**
 - a. The location, species and size of existing significant trees and landmark trees, including those to be removed and those to be retained, and whether they qualify as “fire-resistant” or “highly flammable” as defined in this chapter.**
 - b. The location, species and size of shrubs, including those to be removed and those to be retained, and whether they qualify as “fire-resistant” or “highly flammable” as defined in this chapter.**
 - c. Areas where trees will be removed to reduce overlapping tree canopies including a description of the tree species and diameter at breast height (DBH).**
 - d. New trees, shrubs and bushes to be planted including the species, location and size at maturity, and whether they qualify as “fire-resistant” or “highly flammable” as defined in this chapter.**
 - 7. The location of and information addressing required fuel reduction area standards as described in Section 17.49.130.**

8. A schedule and timetable for vegetation removal and thinning to meet fuel reduction area standards.

17.49.80 Decision Options and Conditions. The Approval Authority may approve, approve with conditions, or deny an application based on the provisions of this chapter. The Approval Authority may require conditions necessary to comply with the intent and provisions of this chapter.

- A. **Conditions.** The required reports shall include design standards and recommendations necessary for the geologist or geotechnical engineer to provide reasonable assurance that the standards of this section can be met with appropriate mitigation measures. These measures, along with staff recommendations, shall be incorporated as conditions into the final decision approving the proposed development.
- B. **Assurances and Penalties.** Assurances and penalties for failure to comply with mitigation, engineering, erosion and water quality plans required under this section shall be as stated in Chapter 17.03 General Provisions.

17.49.90 Land Divisions. No land division or property line adjustment shall be approved that would result in an unbuildable lot or parcel (*i.e.*, a lot or parcel where a permitted or conditional use could not be allowed because it would be unable meet the standards of this chapter).

17.49.95 Appeal / Verification of Natural Hazards boundaries. The Natural Hazards boundaries may be appealed and must be verified occasionally to determine the true location of a hazard area and its functional values on a site. This may be through a site-specific survey or a simple site visit in those cases where existing information demonstrates that the Natural Hazard significance rating does not apply to a site-specific area. Applications for development on a site located in a Natural Hazard area may request a determination that the subject site is not subject to the standards of Chapter 17.49. Verifications / appeals shall be processed as either a Type I or Type II process as outlined below.

A. Type I Appeal / Verification.

1. Applicants for a determination under this section shall submit a site plan meeting the requirements of Chapter 17.72, as applicable.
2. An applicant may request a Type I Verification determination by the community development director. Such requests may be approved provided that there is evidence substantiating that all the requirements of this chapter relative to the proposed use are satisfied and demonstrates that the property also satisfies the following criteria, as applicable:
 - a. No natural features have been disturbed.
 - b. No natural features have been changed.
 - c. The property does not contain a natural hazard area as identified by the city's local natural hazards area maps.

- d. Evidence of prior land use approvals that conform to the natural hazards overlay districts, or which conformed to the natural hazard area overlay district that was in effect prior to the Natural Hazards code adoption date _____.

- B. Type II Appeal / Verification.** Verifications of the Natural Hazards areas which cannot be determined pursuant to the standards of **Chapter 17.49** may be processed under the Type II permit procedure.
- 1. Applicants for a determination under this section shall submit a site plan meeting the requirements of (site plan requirements) as applicable.
 - 2. Such requests may be approved provided that there is evidence that demonstrates in a report prepared by one or more qualified professionals with experience and credentials in natural resource areas, including wildlife biology, ecology, hydrology and forestry, that a resource function(s) and/or land feature(s) does not exist on a site-specific area.
 - 3. Verification to remove a recently developed area from the Natural Hazards shall show that all of the following have been met:
 - a. All approved development in the Natural Hazards area has been completed
 - b. All mitigation required for the approved development has been successful.
 - c. The previously identified Natural Hazards area on the developed site no longer exist or have been subject to a significant impact.

Natural Hazards – Mitigation (NH-M) Subdistrict

17.49.100 Natural Hazards – Mitigation (NH-M) Subdistrict. The NH-M is intended to mitigate natural hazard impacts based on objective development standards for each applicable hazard type (earthquakes, steep slopes, landslides and wildfires) and the recommendations of required site-specific hazard studies.

17.49.110 Earthquake Mitigation Standards. Buildings and on-site construction projects must meet the seismic standards of the applicable Oregon Structural Specialty Code and Residential Specialty Code seismic requirements per Section 17.49.30.A.

17.49.120 Steep Slope and Landside Mitigation Standards. The following plans and development standards apply to steeply sloped land (15% or greater) and to mapped landslide hazard areas on any proposed development site, as determined by the McMinnville Natural Hazards Inventory.

A. Required Plans.

1. If slopes of 15% or greater exist on the development site, the applicant shall submit an Erosion Control Plan per Section 17.49.30.A.
2. If moderate to high landslide hazard areas exist on the development site, the applicant shall submit a Geological Site Assessment per Section 17.49.60.A.
3. The City may contract with an independent geologist or geotechnical engineer to review the Geological Site Assessment.

B. Development Standards. The applicant's site and building plans shall be consistent with the recommendations of the required Geological Site Assessment, including any changes and conditions required by the review authority after considering the recommendations of the independent peer reviewer.

1. If the Geological Site Assessment recommends a Geotechnical Engineering Study, building and construction plans shall be consistent with the recommendations of this study.
2. Generally, development should avoid slopes of 25% and greater, except where consistent with the recommendations of the Geological Site Assessment.
3. Removal of landmark trees shall be prohibited – except where the review authority determines that there is no reasonable alternative available to achieve project objectives.
4. Removal of significant trees shall be the minimum necessary to meet project objectives or to comply with an approved wildfire mitigation plan.

17.49.130 Wildfire Assessment and Mitigation Standards. This section supplements base zone development regulations to mitigate potential impacts of wildfire on land with moderate to severe wildfire areas shown on the McMinnville Natural Hazards Inventory Map.

- A. **Purpose.** These standards balance the need to protect riparian corridors, and landmark and significant trees, while reducing fuel loads and facilitating firefighter access to structures in the event of a wildfire.
 - 1. The following studies and development standards apply to moderate, high and severe wildfire hazard areas on any proposed development site, as determined by the McMinnville Natural Hazards Inventory.
 - 2. In limited situations, removal or major pruning of significant trees may be required to meet the standards of this section. Removal of landmark trees shall only be considered as a last resort.
- B. **Required Wildfire Mitigation Plan.** If moderate to severe wildfire hazards exist on or adjacent to a development site, or when a development site abuts a significant tree grove, the applicant shall prepare a Wildfire Mitigation Plan as prescribed by Section 17.49.060.C. The plan shall apply for the following land use applications:
 - 1. When a new habitable building, or an addition to an existing habitable building is proposed.
 - 2. Applications for Planned Developments and/or Land Divisions.
- C. **Fuel Reduction Area.** To reduce fire spread both from and to structures on the property, and to adjoining properties, the establishment and maintenance of a fuel reduction area shall be required.
 - 1. The general fuel reduction area shall be measured thirty feet from the exterior walls of habitable structures on development sites with slopes of 10% or less.
 - 2. In steeply sloped areas, an additional ten feet of fuel reduction area shall be added for each 10% increase in slope. Thus, a 40-foot fuel reduction area would be required for a site with an average slope of 11-20%, and a 50-foot fuel reduction area would be required for a lot with a site with an average slope of 21-30%.



D. Vegetation and combustible materials within the fuel reduction area shall meet the following standards:

- 1. All standing dead and dying vegetation shall be removed from the property, except when considered ecologically beneficial (e.g., a snag located in a riparian corridor).**
- 2. Newly planted vegetation within 30 feet of any building or deck shall not include highly flammable species. The setback shall be increased by ten feet for each ten percent increase in the average slope of the**

- property (measured from the proposed building or buildings) over ten percent.
3. Within five feet of a new building, addition, or deck, existing highly flammable vegetation shall be removed. However,
 - a. Land divisions and planned developments shall be designed to save landmark trees and minimize impacts on significant trees; and
 - b. The placement and design of new buildings on an existing lot shall avoid landmark trees if possible and minimize impacts on significant trees.
 4. Within five feet of a new building, addition, or deck, combustible man-made and natural materials are prohibited, including but not limited to bark mulch, stored wood, and accumulation of dry leaves and needles. Exception: Combustible materials may be permitted within five feet of a structure by the Planning Director in consultation with the Fire Marshall, if the portion of the structure adjoining the combustible material is constructed with ignition resistant building materials sufficient to reduce the spread of fire.
 5. Tree crowns or limbs shall not extend into the vertical plane of a chimney outlet.
 6. Highly flammable significant and landmark trees shall be maintained to provide at least a 10-foot clearance from new structures (and any subsequent additions thereto) measured as follows:
 - a. Horizontally from a chimney outlet;
 - b. From above the roof of a new building, or addition; and
 - c. From the furthest extension of a new building, or addition or deck.
 - d. If pruning a tree to meet the above requirements would compromise the health and survival of an existing tree(s), the standards a-c above may be modified by the Community Development or Planning Director in consultation with the Fire Marshall, but at a minimum, the trees shall be pruned to maintain at least eight feet of ground clearance.
 7. Canopy spacing of the outermost limbs of highly flammable trees shall be separated by at least 10 feet at mature size within the fuel reduction area.
 - a. Groups of trees that form a continuous canopy may be considered as one tree canopy.
 - b. Canopy spacing requirements do not apply landmark trees, as defined in Chapter 17.58 Trees, or to fire-resistant trees.
 8. Fire-resistant trees (i.e., trees that are not highly flammable) shall be maintained to provide clearance from structures as follows:
 - a. 10 feet horizontal clearance from a chimney outlet.
 - b. At no time shall tree crowns or limbs extend into the vertical plane of a chimney outlet.
 - c. Tree limbs shall be pruned to ensure they do not touch any part of a structure including but not limited to roofs, eaves, and decks.

9. Existing highly flammable trees shall be pruned to provide a ground clearance of a minimum eight feet above the ground, or one-third of the tree height, whichever is less.
10. Existing highly flammable shrubs shall be maintained to provide a clearance from new structures and other flammable vegetation as follows:
 - a. Five feet clearance from the furthest extension of a new building, addition, or deck.
 - b. Separation from other highly flammable shrubs within the fuel reduction area shall be a minimum of two times the shrub's height at maturity.
11. Newly planted highly flammable shrubs shall be:
 - a. A minimum of 30 feet from the furthest extension of any building addition or deck.
 - b. Separated from other listed flammable shrubs by a minimum of two times the shrub's height at maturity.
 - c. Located outside of the drip line of a highly flammable tree.
12. Where either the tree or vegetation is highly flammable: the vertical clearance between the top of understory vegetation (within the drip line of a tree) and the lowest tree limbs, shall be at least three times the height of vegetation.
13. Existing vegetation may be allowed to be retained consistent with an approved Wildfire Mitigation Plan, or upon written approval of the Planning Director in consultation with the Fire Marshall:
 - a. To maintain slope stability;
 - b. To preserve or enhance riparian functions and values;
 - c. To protect or ensure the health of landmark or significant trees; or
 - d. For aesthetic purposes.
- E. Fuel reduction in areas steep slope / slide hazard areas, or significant riparian corridors, shall be included in the erosion control measures outlined in Section 17.49.060.
- F. The Fuel Reduction Area may be reduced or waived when approved by the Planning Director in consultation with the Fire Marshall, based on a finding that fire risk has been reasonably reduced such as in cases where ignition resistant materials and construction methods, or vegetation type and separation, function to enhance the structure's protection from exterior wildfire exposure.

17.49.140 Reserved for Future Use

Natural Hazard – Protection (NH-P) Subdistrict

17.49.150 Natural Hazards – Protection (NH-P) Protection Subdistrict

The NH-P is intended to avoid, and where avoidance is not feasible, to mitigate natural hazard impacts to life and property from each applicable natural hazard type (earthquakes, steep slopes, landslides and wildfires).

- A. Use Limitations and Development Standards. The NH-P Subdistrict includes use limitations and development standards to reduce composite risks to life and property associated with earthquakes, steep slopes, landslides, wildfires and flooding within its boundaries.
- B. Mitigation Based on Required Studies. To mitigate for unavoidable impacts, proposed development must follow the recommendations of required site-specific hazard studies.

17.49.160 Use Limitations. The underlying zoning district determines permitted and conditional uses within the NH-P Subdistrict, subject to additional development limitations and standards required by the NH-P Subdistrict. Residential density transfer may be permitted as prescribed in Section 17.49.170. The following use limitations apply to land within the NH-P Subdistrict.

- A. Creation of New Lots. Creation of new lots on land within the NH-P Subdistrict shall be prohibited, except when based on site-specific natural hazard impact studies and approved through the Chapter 17.48 Planned Development Overlay.
- B. Residential Zones. In residential zones, one dwelling unit shall be permitted for each lot-of-record, provided that:
 - 1. There is inadequate space to place a residence with a footprint of 2,000 square feet or less on the lot outside of the NH-P Subdistrict.
 - 2. The recommendations of required natural hazard impact studies are followed.
 - 3. Landmark trees are protected except where there is no reasonable alternative to allow a home with a 2,000 square foot footprint (or less) on a lot-of-record.
 - 4. Impacts on significant trees shall be minimized, recognizing that tree removal may be required to meet Section 17.49.130 Wildfire Assessment and Mitigation requirements and fuel reduction requirements.
- C. Large-Format Commercial Development. Large format commercial development as defined in Chapter 17.56 shall not be permitted within the NH-P Subdistrict.
- D. Commercial and Industrial Zones. In commercial and industrial zones, existing habitable structures and surface parking areas may be expanded by up to 50% within the NH-P Subdistrict, provided that:
 - 1. There is inadequate space to expand the structure by 50% outside of the NH-P Subdistrict.

2. The proposed expansion is located outside mapped high risk landslide and wildfire areas and is designed to minimize the building footprint and loss of significant and landmark trees on land within the NH-P Subdistricts.
 3. Outdoor storage areas are prohibited within the NH-P Subdistrict.
 4. The recommendations of required natural hazard impact studies are followed.
- E. **Flood Area Zone (F-P Zone)**. Public uses are permitted within the F-P Zone, provided that:
1. Impacts on significant and landmark trees are minimized.
 2. Scenic views are considered, enhanced and maintained.
 3. The recommendations of required natural hazard studies are followed.

17.49.170 Residential Density Transfer. A transfer of development density from undeveloped buildable land within the Natural Hazard Protection zone to other property within the city limits is encouraged. Density transfer may occur through the planned development process, as indicated below.

- A. **Development Density to Transfer from National Hazard Protection Zone (NH-P)**. The land area from which density can be transferred excludes developed and unbuildable areas, such as riparian corridors, slopes 15% or greater and easements. 50% of the development density of identified qualifying land within land may be transferred to any other residential zone.
- B. **Development Density in Receiving Area.** Up to a maximum 20% reduction in average minimum lot size or lot area per unit requirements, is allowed in order to accommodate the density transfer. Developments utilizing a transfer of density will need to apply for a Planned Development pursuant to Chapter 17.51/
- C. **If Density Transfer is Not Feasible.** In situations where density transfer is not feasible, a maximum of one dwelling unit per 2.5 acres may be allowed on land zoned for residential use within the NH-P Subdistrict, consistent with the recommendations of a geotechnical engineering study and any conditions required by the review authority.
- D. **Recording of Density Transfer.** In all cases where this bonus is used, covenants or other legally binding agreements that run with the land shall preclude the development of the land from which the density is transferred. The covenants or other legally binding agreements shall be recorded before the transferred density may be used.

17.49.180 Earthquake Mitigation Standards. Buildings and on-site construction projects must meet the seismic standards of the applicable Oregon Structural Specialty Code and Residential Specialty Code seismic requirements per Section 17.49.30.A.

17.49.190 Steep Slope and Landside Mitigation Standards. The following plans and development standards apply to when development is authorized pursuant to Section 17.49.160 on steeply sloped land (15% or greater) and to mapped landslide hazard areas on any proposed development site, as determined by the McMinnville Natural Hazards Inventory.

A. Required Plans.

1. If slopes of 15% or greater exist on the development site, the applicant shall submit an Erosion Control Plan per Section 17.49.30.A.
2. If moderate to high landslide hazard areas existing on the development site, the applicant shall submit a Geological Site Assessment per Section 17.49.60.A.
3. The City may contract with an independent geologist or geotechnical engineer to review the Geological Site Assessment.

B. Development Standards. Where development is authorized pursuant to Section 17.49.160 (Use Limitations), the applicant's site and building plans shall be consistent with the recommendations of the required Geological Site Assessment, including any changes and conditions required by the review authority after considering the recommendations of the independent peer reviewer.



1. If the Geological Site Assessment recommends a Geotechnical Engineering Study, building and construction plans shall be consistent with the recommendations of this study.
2. Generally, development should avoid slopes of 25% and greater, except where consistent with the recommendations of the Geological Site Assessment.
3. Removal of landmark trees shall be prohibited – except where the review authority determines that there is no reasonable alternative available to achieve project objectives.
4. Removal of significant trees shall be the minimum necessary to meet project objectives or to comply with an approved wildfire mitigation plan.

17.49.200 Wildfire Assessment and Mitigation Standards. Where development is permitted pursuant to Section 17.49.160 (Use Limitations), proposed development within mapped moderate to severe wildfire areas within the NH-P Subdistrict shall be subject to the Wildfire Assessment and Mitigation Stan

City of McMinnville Natural Hazard Overlay



Proposed Overlay Zones Existing Zones

-  Mitigation (NH-M)
-  Protection (NH-P)

-  Flood Area (FP)

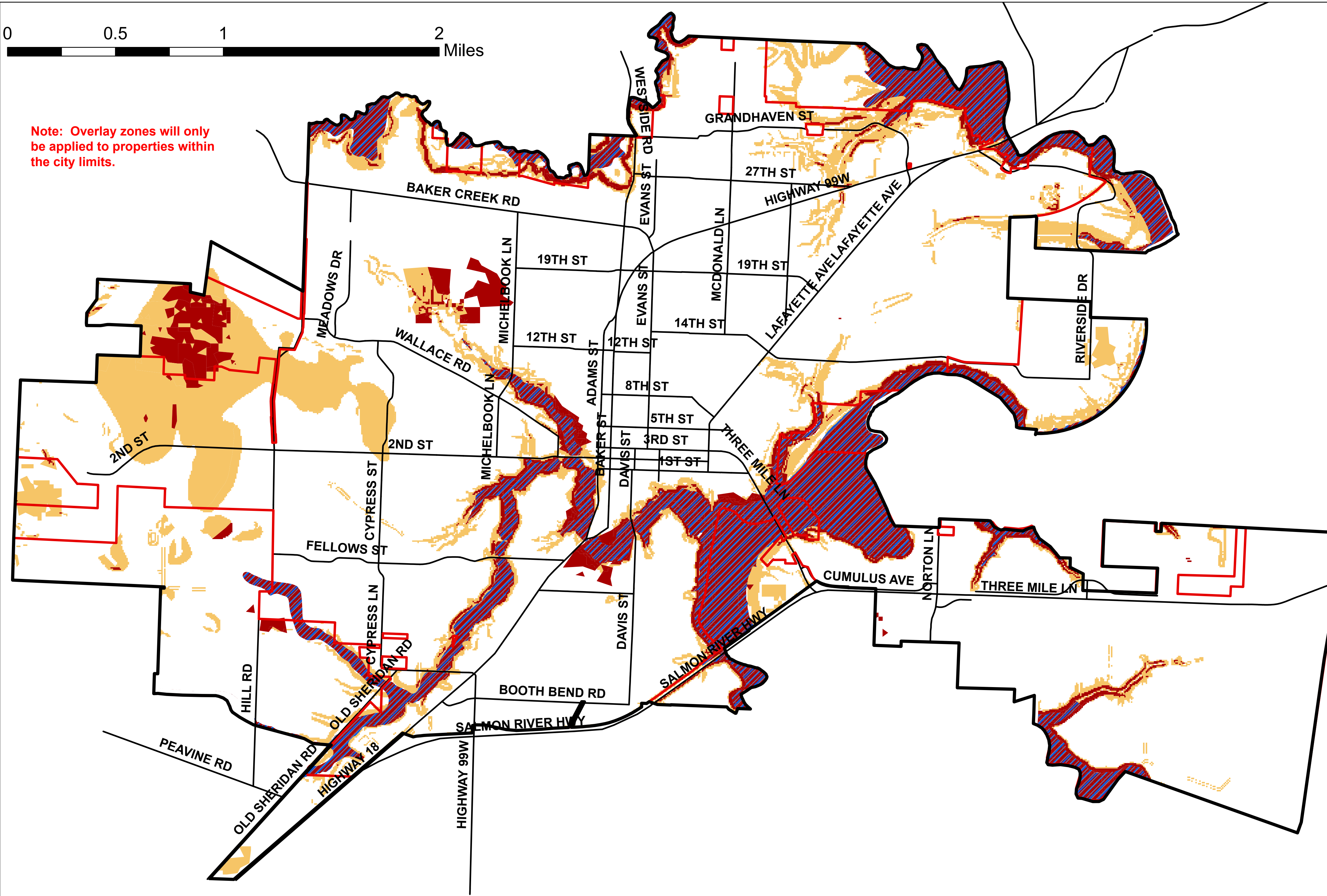
-  City Limits

-  Streets

-  Urban Growth Boundary



Note: Overlay zones will only be applied to properties within the city limits.



Oregon's Statewide Planning Goals and Guidelines

GOAL 7: AREAS SUBJECT TO NATURAL HAZARDS

To protect people and property from natural hazards.

A. NATURAL HAZARD PLANNING

1. Local governments shall adopt comprehensive plans (inventories, policies and implementing measures) to reduce risk to people and property from natural hazards.

2. Natural hazards for purposes of this goal are: floods (coastal and riverine), landslides,¹ earthquakes and related hazards, tsunamis, coastal erosion, and wildfires. Local governments may identify and plan for other natural hazards.

B. RESPONSE TO NEW HAZARD INFORMATION

1. New hazard inventory information provided by federal and state agencies shall be reviewed by the Department in consultation with affected state and local government representatives.

2. After such consultation, the Department shall notify local governments if the new hazard information requires a local response.

3. Local governments shall respond to new inventory information on natural hazards within 36 months after being notified by the Department of Land Conservation and Development, unless extended by the Department.

C. IMPLEMENTATION

Upon receiving notice from the Department, a local government shall:

1. Evaluate the risk to people and

property based on the new inventory information and an assessment of:

a. the frequency, severity and location of the hazard;

b. the effects of the hazard on existing and future development;

c. the potential for development in the hazard area to increase the frequency and severity of the hazard; and

d. the types and intensities of land uses to be allowed in the hazard area.

2. Allow an opportunity for citizen review and comment on the new inventory information and the results of the evaluation and incorporate such information into the comprehensive plan, as necessary.

3. Adopt or amend, as necessary, based on the evaluation of risk, plan policies and implementing measures consistent with the following principles:

a. avoiding development in hazard areas where the risk to people and property cannot be mitigated; and

b. prohibiting the siting of essential facilities, major structures, hazardous facilities and special occupancy structures, as defined in the state building code (ORS 455.447(1)

(a)(b)(c) and (e)), in identified hazard areas, where the risk to public safety cannot be mitigated, unless an essential facility is needed within a hazard area in order to provide essential emergency response services in a timely manner.²

4. Local governments will be deemed to comply with Goal 7 for coastal and riverine flood hazards by adopting and

¹ For "rapidly moving landslides," the requirements of ORS 195.250-195.275 (1999 edition) apply.

² For purposes of constructing essential facilities, and special occupancy structures in tsunami inundation zones, the requirements of the state building code - ORS 455.446 and 455.447 (1999 edition) and OAR chapter 632, division 5 apply.

implementing local floodplain regulations that meet the minimum National Flood Insurance Program (NFIP) requirements.

D. COORDINATION

1. In accordance with ORS 197.180 and Goal 2, state agencies shall coordinate their natural hazard plans and programs with local governments and provide local governments with hazard inventory information and technical assistance including development of model ordinances and risk evaluation methodologies.

2. Local governments and state agencies shall follow such procedures, standards and definitions as may be contained in statewide planning goals and commission rules in developing programs to achieve this goal.

GUIDELINES

A. PLANNING

1. In adopting plan policies and implementing measures to protect people and property from natural hazards, local governments should consider:

- a. the benefits of maintaining natural hazard areas as open space, recreation and other low density uses;
- b. the beneficial effects that natural hazards can have on natural resources and the environment; and
- c. the effects of development and mitigation measures in identified hazard areas on the management of natural resources.

2. Local governments should coordinate their land use plans and decisions with emergency preparedness, response, recovery and mitigation programs.

B. IMPLEMENTATION

1. Local governments should give special attention to emergency access when considering development in identified hazard areas.

2. Local governments should consider programs to manage stormwater runoff as a means to help address flood and landslide hazards.

3. Local governments should consider nonregulatory approaches to help implement this goal, including but not limited to:

- a. providing financial incentives and disincentives;
- b. providing public information and education materials;
- c. establishing or making use of existing programs to retrofit, relocate, or acquire existing dwellings and structures at risk from natural disasters.

4. When reviewing development requests in high hazard areas, local governments should require site-specific reports, appropriate for the level and type of hazard (e.g., hydrologic reports, geotechnical reports or other scientific or engineering reports) prepared by a licensed professional. Such reports should evaluate the risk to the site as well as the risk the proposed development may pose to other properties.

5. Local governments should consider measures that exceed the National Flood Insurance Program (NFIP) such as:
- a. limiting placement of fill in floodplains;
 - b. prohibiting the storage of hazardous materials in floodplains or providing for safe storage of such materials; and
 - c. elevating structures to a level higher than that required by the NFIP and the state building code.

Flood insurance policy holders may be eligible for reduced insurance rates through the NFIP's Community Rating System Program when local governments adopt these and other flood protection measures.

City of McMinnville Addendum to the Yamhill County Multi-Jurisdictional Hazard Mitigation Plan



Photo Credits: Gary Halvorson, Oregon State Archives

Effective: December 22, 2020 through December 21, 2025



Prepared for:
City of McMinnville

Prepared by:
**University of Oregon
Institute for Policy Research and Engagement
Oregon Partnership for Disaster Resilience**

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and

Additional Support Provided by:



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FEMA

January 20, 2021

The Honorable Casey Kulla
Chair Kulla, Yamhill County Board of Commissioners
535 NE 5th St.
McMinnville, Oregon 97128

Dear Chair Kulla:

On December 22, 2020, the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region 10, approved the Yamhill County Hazard Mitigation Plan as a multi-jurisdictional local plan as outlined in Code of Federal Regulations Title 44 Part 201. This approval provides the below jurisdictions eligibility to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's, Hazard Mitigation Assistance grants projects through December 21, 2025, through your state:

| | | | |
|---------------------|-----------------|------------------|-----------------|
| Yamhill County | City of Amity | City of Carlton | City of Dayton |
| City of McMinnville | City of Newberg | City of Sheridan | City of Yamhill |

FEMA individually evaluates all application requests for funding according to the specific eligibility requirements of the applicable program. Though a specific mitigation activity or project identified in the plan may meet the eligibility requirements, it may not automatically receive approval for FEMA funding under any of the aforementioned programs.

Approved mitigation plans may be eligible for points under the National Flood Insurance Program's Community Rating System (CRS). For additional information regarding the CRS, please visit: www.fema.gov/national-flood-insurance-program-community-rating-system or contact your local floodplain manager. Over the next five years, we encourage your communities to follow the plan's schedule for monitoring and updating, and to develop further mitigation actions. To continue eligibility, jurisdictions must review, revise as appropriate, and resubmit the plan within five years of the original approval date.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact Joseph Murray, Planner with Oregon Office of Emergency Management, at (503) 378-2911, who locally coordinates and administers these efforts.

Sincerely,

Kristen Meyers, Director
Mitigation Division

Enclosure

cc: Amie Bashant, Oregon Office of Emergency Management

EG:vl

RESOLUTION NO. 2020 – 67

A Resolution Adopting the City of McMinnville Representation in the Updates to the Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan

RECITALS:

Whereas, the City of McMinnville recognizes the threat that natural hazards pose to people, property and infrastructure within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people, property and infrastructure from future hazard occurrences; and

Whereas, an adopted Natural Hazards Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the City of McMinnville has fully participated in the FEMA prescribed mitigation planning process to prepare the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan*, which has established a comprehensive, coordinated planning process to eliminate or minimize these vulnerabilities; and

Whereas, the City of McMinnville has identified natural hazard risks and prioritized a number of proposed actions and programs needed to mitigate the vulnerabilities of the City of McMinnville to the impacts of future disasters within the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan*; and

Whereas, these proposed projects and programs have been incorporated into the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan* that has been prepared and promulgated for consideration and implementation by the cities of Yamhill County; and

Whereas, the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials have reviewed the *City of McMinnville addendum* to the *Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan* and pre-approved it (dated, September 10, 2020) contingent upon this official adoption of the participating governments and entities; and

Whereas, the NHMP is comprised of comprised of three volumes: Volume I: Basic Plan, Volume II: Jurisdictional Addenda, and Volume III: Appendices, collectively referred to herein as the NHMP; and

Whereas, the NHMP is in an on-going cycle of development and revision to improve its effectiveness; and

Whereas, City of McMinnville adopts the NHMP and directs the staff to develop, approve, and implement the mitigation strategies and any administrative changes to the NHMP.

NOW, THEREFORE, BE IT RESOLVED BY THE COMMON COUNCIL OF THE CITY OF McMinnville, OREGON, as follows:

1. That the City of McMinnville adopts *the Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan* as an official plan; and
2. That the City of McMinnville will submit this Adoption Resolution to the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials to enable final approval of the *Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan*.
3. That this resolution shall take effect immediately upon passage and shall continue in full force and effect until revoked or replaced

Adopted by the Common Council of the City of McMinnville at a regular meeting held the 8th day of December 2020 by the following votes:

Ayes: Drabkin, Garvin, Geary, Menke, Peralta, Stassens

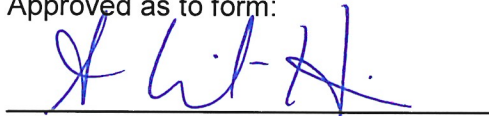
Nays: _____

Approved this 8th day of December 2020.



MAYOR

Approved as to form:



City Attorney

Attest:



City Recorder

A RESOLUTION BY THE MCMINNVILLE WATER AND LIGHT COMMISSION ADOPTING THE CITY OF MCMINNVILLE REPRESENTATION IN THE UPDATES TO THE YAMHILL COUNTY MULTI-JURISDICTIONAL NATURAL HAZARD MITIGATION PLAN

WHEREAS, the City of McMinnville, a municipal corporation of the State of Oregon, acting by and through its Water and Light Commission (“McMinnville Water and Light Commission”) is responsible for the management of the water, electric, and fiber-optic systems of McMinnville; and

WHEREAS, the McMinnville Water and Light Commission recognizes the threat that natural hazards pose to people, property and infrastructure within our community; and

WHEREAS, undertaking hazard mitigation actions will reduce the potential for harm to people, property and infrastructure from future hazard occurrences; and

WHEREAS, an adopted Natural Hazard Mitigation Plan (NHMP) is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

WHEREAS, by participation of its professional management staff on the McMinnville NHMP Steering Committee, and review of the addendum in the commission meeting record of November 17, 2020, the McMinnville Water and Light Commission has fully participated in the FEMA prescribed mitigation planning process to prepare the *City-of-McMinnville addendum to the Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan*, which has established a comprehensive, coordinated planning process to eliminate or minimize these vulnerabilities; and

WHEREAS, in the addendum the McMinnville Water and Light Commission and the McMinnville City Council have identified natural hazard risks and prioritized a number of proposed actions and programs needed to mitigate the vulnerabilities of the City of McMinnville to the impacts of future disasters within the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan*; and

WHEREAS, these proposed projects and programs have been incorporated into the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan* that has been prepared and promulgated for consideration and implementation by the cities of Yamhill County; and

WHEREAS, the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials have reviewed the *City-of-McMinnville addendum* to the *Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan* and pre-approved it (dated, September 10, 2020) contingent upon this official adoption of the participating governments and entities;

WHEREAS, the NHMP is comprised of three volumes: Volume I: Basic Plan, Volume II: Jurisdictional Addenda, and Volume III: Appendices, collectively referred to herein as the NHMP; and

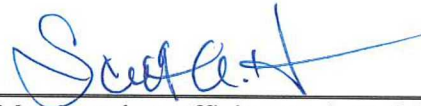
WHEREAS, the NHMP is in an on-going cycle of development and revision to improve its effectiveness; and

WHEREAS, the McMinnville Water and Light Commission adopts the NHMP and directs its general manager to develop, approve, and implement the mitigation strategies and any administrative changes to the NHMP.

NOW, THEREFORE, BE IT RESOLVED, that the McMinnville Water and Light Commission adopts *the City-of-McMinnville addendum to the Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan, as set forth in the commission meeting record of November 17, 2020*, as an official plan; and

BE IT FURTHER RESOLVED, that the McMinnville Water and Light Commission will submit this Adoption Resolution to the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials to enable final approval of the *Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan*.

Adopted this 17 day of November, 2020



Mayor and ex-officio member of the Water and Light Commission

ATTEST:



Clerk of the Commission

Date: 11/30/20

Purpose

This is an update of the McMinnville addendum to the Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan (NHMP). This addendum supplements information contained in Volume I (Basic Plan) which serves as the NHMP foundation, and Volume III (Appendices) which provide additional information. This addendum meets the following requirements:

- Multi-Jurisdictional **Plan Adoption** §201.6(c)(5),
- Multi-Jurisdictional **Participation** §201.6(a)(3),
- Multi-Jurisdictional **Mitigation Strategy** §201.6(c)(3)(iv), and
- Multi-Jurisdictional **Risk Assessment** §201.6(c)(2)(iii).

Updates to McMinnville's addendum are further discussed throughout the NHMP, and within Volume III, Appendix B, which provides an overview of alterations to the document that took place during the update process.

The City of McMinnville and the McMinnville Water and Light Commission (collectively "the City" or "McMinnville") adopted their addendum to the Yamhill County Multi-jurisdictional NHMP on **December 8 and November 17, 2020** respectively. FEMA Region X approved the Yamhill County NHMP and the City's addendum on **December 22, 2020**. With approval of this NHMP the City is now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through **December 21, 2025**.

Mitigation Plan Mission

The NHMP mission states the purpose and defines the primary functions of the NHMP. It is intended to be adaptable to any future changes made to the NHMP and need not change unless the community's environment or priorities change.

The City concurs with the mission statement developed during the Yamhill County planning process (Volume I, Section 3):

To promote public policy and mitigation activities which will enhance the safety to life and property from natural hazards.

This can be achieved by increasing public awareness, documenting the resources for risk reduction and loss-prevention, and identifying activities to guide the county towards building a safer, more sustainable community.

Mitigation Plan Goals

Mitigation plan goals are more specific statements of direction that Yamhill County citizens, and public, and private partners can take while working to reduce the City's risk from natural hazards. These statements of direction form a bridge between the broad mission statement, and serve as checkpoints, as agencies, and organizations begin implementing mitigation action items.

The City concurs with the goals developed during the Yamhill County planning process (Volume I, Section 3). All NHMP goals are important and are listed below in no order of priority. Establishing community priorities within action items neither negates nor eliminates any goals, but it establishes which action items to consider implementing first, should funding become available.

Below is a list of the NHMP goals:

GOAL 1: EMERGENCY OPERATIONS

- Coordinate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures and with other agencies.

GOAL 2: EDUCATION AND OUTREACH

- Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.

GOAL 3: PARTNERSHIPS

- Develop effective partnerships with public and private sector organizations and significant agencies and businesses for future natural hazard mitigation efforts.
- Coordinate natural hazard mitigation actions between the County and local jurisdictions to create more cohesive and effective hazard mitigation efforts.

GOAL 4: PREVENTIVE

- Develop and implement activities to protect human life, commerce, and property from natural hazards.
- Reduce losses and repetitive damage for chronic hazard events while promoting insurance coverage for catastrophic hazards.

GOAL 5: NATURAL RESOURCES UTILIZATION

- Link natural resources management, land use planning, and watershed planning with natural hazard mitigation activities to protect natural systems and allow them to serve natural hazard mitigation functions.

GOAL 6: IMPLEMENTATION

- Implement strategies to mitigate the effects of natural hazards and increase the quality of life and resilience of economies in Yamhill County.

GOAL 7: DEVELOPMENT

- Communities appropriately apply development standards that consider the potential impacts of natural hazards.

GOAL 8: DOCUMENTATION

- Document and evaluate progress in achieving hazard mitigation strategies and action items.

Process and Participation

This section of the NHMP addendum addresses 44 CFR 201.6(a)(3), *Participation*.

In addition to establishing a comprehensive community-level mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K), and the regulations contained in 44 CFR 201, require that jurisdictions maintain an approved NHMP to receive federal funds for mitigation projects. Local adoption, and federal approval of this NHMP ensures that the city will remain eligible for pre-, and post-disaster mitigation project grants.

The Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Institute for Policy Research and Engagement (IPRE) collaborated with the Oregon Office of Emergency Management (OEM), Yamhill County, and McMinnville to update their NHMP. This project is funded through the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program for DR-4328 (HMGP-DR-4328-OR-5-P). Members of the McMinnville NHMP Steering committee also participated in the County NHMP update process (Volume III, Appendix B).

The Yamhill County NHMP, and McMinnville addendum, are the result of a collaborative effort between citizens, public agencies, non-profit organizations, the private sector, and regional organizations. The McMinnville NHMP Steering Committee guided the process of developing the NHMP.

Convener and Committee

The McMinnville Community Development Director serves as the NHMP addendum convener. The convener of the NHMP will take the lead in implementing, maintaining, and updating the addendum to the Yamhill County NHMP in collaboration with the designated convener of the Yamhill County NHMP (Yamhill County Emergency Manager).

Representatives from the City of McMinnville Steering Committee met formally, and informally, to discuss updates to their addendum (Volume III, Appendix B). The steering committee reviewed, and revised the City's addendum, with focus on the NHMP's risk assessment, and mitigation strategy (action items).

This addendum reflects decisions made at the designated meetings, and during subsequent work, and communication with Yamhill County Emergency Manager, and OPDR. The changes are highlighted with more detail throughout this document, and within Volume III, Appendix B. Other documented changes include a revision of the City's risk assessment, and hazard identification sections, action items, and community profile.

The McMinnville steering committee was comprised of the following representatives:

- Convener, Mike Bisset, Community Development Director
- Jenny Berg, Library Director
- James Burke, McMinnville Water & Light, Water Division Director
- Scott Burke, Information Technology Director
- John Dietz, McMinnville Water & Light, General Manager
- David Koch, City Attorney
- Leland Koester, Wastewater Services Manager
- Rich Leipfert, Fire Chief
- David Renshaw, Superintendent

- Heather Richards, Planning Director
- Scott Rosenbalm, McMinnville Water & Light, Electric Division Director
- Matt Scales, Chief of Police
- Larry Sherwood, Engineering Technician and Inspector
- Jeff Towery, City Manager

Public Participation

Public participation was achieved by posting the NHMP publicly and providing community members the opportunity to make comments and suggestions during the review process. Community members were also provided an opportunity for comment via a survey administered by IPRE (Volume III, Appendix F). During the City public review period (Attachment B) there were no comments provided.

Implementation and Maintenance

The City Council and the Water and Light Commission will be responsible for adopting the McMinnville addendum to the Yamhill County NHMP. This addendum designates the steering committee, and a convener to oversee the development, and implementation of action items. Because the City addendum is part of the County's multi-jurisdictional NHMP, the City will look for opportunities to partner with the County. The City's steering committee will convene after re-adoption of the McMinnville NHMP addendum on an annual schedule. The County is meeting on a semi-annual basis and will provide opportunities for the cities to report on NHMP implementation, and maintenance during their meetings. The Community Development Director will serve as the convener and will be responsible for assembling the steering committee. The steering committee will be responsible for:

- Reviewing existing action items to determine suitability of funding;
- Reviewing existing, and new risk assessment data to identify issues that may not have been identified at NHMP creation;
- Educating, and training new steering committee members on the NHMP, and mitigation actions in general;
- Assisting in the development of funding proposals for priority action items;
- Discussing methods for continued public involvement; and
- Documenting successes, and lessons learned during the year.

The convener will also remain active in the County's implementation, and maintenance process (Volume I, Section 4).

The City will utilize the same action item prioritization process as the County (Volume I, Section 4).

Implementation through Existing Programs

This NHMP is strategic and non-regulatory in nature, meaning that it does not necessarily set forth any new policy. It does, however, provide: (1) a foundation for coordination and collaboration among agencies and the public in the city; (2) identification and prioritization of future mitigation activities; and (3) aid in meeting federal planning requirements and qualifying for assistance programs. The mitigation plan works in conjunction with other city plans and programs including the Comprehensive Land Use Plan, Capital Improvements Plan, and Building Codes, as well as the [Yamhill County NHMP](#), and the [State of Oregon NHMP](#).

The mitigation actions described herein (and priority actions in Attachment A) are intended to be implemented through existing plans and programs within the city. Plans and policies already in existence have support from residents, businesses and policy makers. Where possible, McMinnville will implement the NHMP's recommended actions through existing plans and policies. Many land-use, comprehensive and strategic plans get updated regularly, allowing them to adapt to changing conditions and needs. Implementing the NHMP's action items through such plans and policies increases their likelihood of being supported and implemented. Implementation opportunities are further defined in action items when applicable.

Future development without proper planning may result in worsening problems associated with natural hazards. McMinnville's acknowledged comprehensive plan is the City of McMinnville Comprehensive Plan. The City implements the plan through the Community Development Code.

McMinnville currently has the following plans that relate to natural hazard mitigation. For a complete list visit the City's [website](#):

- Comprehensive Plan (Volume 1, [Volume 2](#), Volume 3)
- [McMinnville Municipal Code](#)
 - Title 13 Public Utilities
 - Title 15 Building and Construction
 - Title 17 Zoning ([17.48 – Flood Area Zone](#), [17.53 Land Division Standards](#))
- Building Code, [2017 Oregon State Building Code](#) based on 2015 International Residential Code (IRC), and 2012 International Building Code (*to be updated to the 2020 Oregon State Building Code, anticipated October 2020*)
- [Emergency Operations Plan](#) (2010)
- [Public Facility Plan](#) (1995)
- [Transportation System Plan](#) (2010)
- [Conveyance System Master Plan](#) (2008)
- Water Master Plan (2010)
- [Storm Drainage Master Plan](#) (2009)
- Electric System Planning Study (2015)
- [Water Reclamation Facilities Plan](#) (2009)
- McGuire Emergency Action Plan (2018)
- Fire District Seismic Assessment (2018)
- Facilities Assessment (2018)
- [Highway 18/99w South Interchange Access Management Plan](#) (2002)
- [McMinnville Westside Bicycle and Pedestrian Plan](#) (1995)
- [Downtown Improvement Plan](#) (2000)
- [Northeast Gateway Plan](#) (2012)
- [Urban Renewal Plan](#) (2013)
- [Economic Development Strategic Plan](#) (2019)
- McMinnville Water & Light COOP (2018)

Other plans:

- [Yamhill County Community Wildfire Protection Plan](#) (2009, revised Nov. 2015)

Government Structure

The McMinnville City Charter establishes a Mayor-Council form of government, which vests policy authority in a volunteer City Council, and administrative authority for day-to-day operations in an appointed, professional City Manager. The McMinnville City Council consists of a Mayor and six Councilors (two from each ward) who serve four-year terms. The Council meets at least once per month at City Hall. The agenda of each meeting includes time for citizen comment. The city charter vest authority over the water and electric systems of the city in the Water and Light Commission (MW&L). The Commission consists of the mayor and four commissioners whom are appointed to four-year terms by the mayor and approved by the city council. The commission meets at least once per month.

The City of McMinnville currently has the following departments which have a role in natural hazard mitigation:

City Manager office provides strategic planning, budget and finance, and development of public policy recommendations to the City Council.

Community Development is composed of the airport, public works, engineering, and wastewater treatment facilities. Together the departments are responsible for maintaining and operating many of the basic urban services including the City's buildings and fleet (equipment), parks, streets, stormwater system, and wastewater system. The Public Works Department is responsible for the city's [Snow & Ice Response Plan](#).

Planning services include all long range and current planning for new development, as well as the City's flood plain management zone. Planning is also responsible for implementation of the Comprehensive Plan. The planning department also includes the building division which reviews and inspects commercial, industrial, and residential developments.

Police services include law enforcement activities and emergency management (emergency preparedness, mitigation, response and recovery efforts for McMinnville during emergencies, disasters, or disruptions).

Fire provides emergency services including fire suppression, emergency medical response, hospital ambulance transportation, water and dive rescue operations, hazardous materials incidents, and disaster response. Non-emergency services include fire prevention and inspection services, code enforcement, public safety education services/CPR training, fire extinguisher use, residential safety surveys, home fire escape planning, emergency and disaster preparedness planning and training for citizens (CERT), and fire and life safety education in McMinnville schools.

McMinnville Water & Light (MW&L) provides water, power, and fiber to the greater McMinnville area. A general manager oversees daily operations, budgets, finances, and advises the commission on strategic planning. MW&L serves approximately 17,000 electrical customers, 12,000 water customers, and fiber to the City of McMinnville and McMinnville School District facilities. MW&L's electric utility encompasses approximately 75 square miles, has 7 electric sub-stations (11 power transformers), 332 miles of primary distribution lines (55% overhead, 45% underground), and a 115 KV transmission line (5.6 miles). The water utility owns 6350 acres of watershed in the Coast Mountain Range where McGuire and Haskins Reservoirs are located (3.5 billion gallons capacity). Water from McGuire and Haskins Reservoirs is treated at the Norman Scott Water Treatment Plant, which operates

24 hours a day/365 days per year and has the capacity to treat up to 22 million gallons of water per day. After treatment, water is stored in four water reservoirs with storage capacity of 22.7 million gallons.

Continued Public Participation

An open public involvement process is essential to the development of an effective NHMP. To develop a comprehensive approach to reducing the effects of natural disasters, the planning process shall include opportunities for the public, neighboring communities, local, and regional agencies, as well as, private, and non-profit entities to comment on the NHMP during review.¹ Keeping the public informed of efforts to reduce its risk to future natural hazard events is important for successful NHMP implementation, and maintenance. As such, the City is committed to involving the public in the NHMP review and update process (Volume I, Section 4). The City posted the plan update for public comment before FEMA approval, and after approval will maintain the plan on the City's website:

<https://www.mcminnvilleoregon.gov/>.

NHMP Maintenance

The Yamhill County NHMP, and City addendum will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. During the County NHMP update process, the City will also review, and update its addendum (Volume I, Section 4). The convener will be responsible for convening the steering committee to address the questions outlined below.

- Are there new partners that should be brought to the table?
- Are there new local, regional, state or federal policies influencing natural hazards that should be addressed?
- Has the community successfully implemented any mitigation activities since the NHMP was last updated?
- Have new issues or problems related to hazards been identified in the community?
- Are the actions still appropriate given current resources?
- Have there been any changes in development patterns that could influence the effects of hazards?
- Have there been any significant changes in the community's demographics that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment?
- Has the community been affected by any disasters? Did the NHMP accurately address the impacts of this event?

These questions will help the steering committee determine what components of the mitigation plan need updating. The steering committee will be responsible for updating any deficiencies found in the NHMP.

¹ Code of Federal Regulations, Chapter 44. Section 201.6, subsection (b). 2015

Mitigation Strategy

This section of the NHMP addendum addresses 44 CFR 201.6(c)(3)(iv), *Mitigation Strategy*.

The City's mitigation strategy (action items) were first developed during the 2019-2020 NHMP planning process and will be revised during subsequent NHMP updates. During these processes, the steering committee assessed the City's risk, identified potential issues, and developed a mitigation strategy (action items).

Priority Action Items

Table MA-1 presents a list of mitigation actions. The steering committee decided to modify the prioritization of action items in this update to reflect current conditions (risk assessment), needs, and capacity. High priority actions are shown in **bold** text with grey highlight. The City will focus their attention, and resource availability, upon these achievable, high leverage, activities over the next five-years. Although this methodology provides a guide for the steering committee in terms of implementation, the steering committee has the option to implement any of the action items at any time. This option to consider all action items for implementation allows the committee to consider mitigation strategies as new opportunities arise, such as capitalizing on funding sources that could pertain to an action item that is not currently listed as the highest priority. Refer to Attachment A for detailed information for each high priority action. Full text of the plan goals referenced in Table MA-1 is located on page MA-2.

Table MA-I McMinnville Action Items

| Natural Hazard Action ID | Action Item | Coordinating Organization (Lead) | Partners | Potential Funding | Cost | Timing | Plan Goals Addressed | | | | | | | |
|-----------------------------|---|----------------------------------|---|-----------------------------------|------|---------|----------------------|--------|--------|--------|--------|--------|--------|--------|
| | | | | | | | Goal 1 | Goal 2 | Goal 3 | Goal 4 | Goal 5 | Goal 6 | Goal 7 | Goal 8 |
| Multi-Hazard Actions | | | | | | | | | | | | | | |
| Multi-Hazard #1 | Develop, enhance, and implement public education and information materials concerning mitigation, preparedness and safety procedures for identified natural hazards. | Emergency Management, MW&L | Planning, Public Works, Fire, Police | General fund, grants | L | Ongoing | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| Multi-Hazard #2 | Incorporate mitigation planning provisions into community planning processes such as comprehensive, capital improvement, land use, transportation plans, zoning ordinances, community development practices, etc. | Planning | Engineering, MW&L | General fund, utility rates | L | Short | ✓ | | | ✓ | ✓ | ✓ | ✓ | |
| Multi-Hazard #3 | Identify critical facilities without emergency power and encourage these facilities to secure emergency power to mitigate power outage events due to natural hazard events. Consider outreach to private property owners. | MW&L | Fire, Police, Public Works, School District | General fund, utility rates | H | Medium | ✓ | | ✓ | | ✓ | ✓ | ✓ | |
| Multi-Hazard #4 | Construct resilient above ground and underground power grid to reduce power line failure during severe wind or winter ice storm events. | MW&L | Public Works, Planning, Developers | Utility rates, private investment | H | Medium | ✓ | | ✓ | ✓ | ✓ | | ✓ | |

| Natural Hazard Action ID | Action Item | Coordinating Organization (Lead) | Partners | Potential Funding | Cost | Timing | Plan Goals Addressed | | | | | | | |
|--------------------------|---|----------------------------------|---|-------------------------------------|----------|----------------|----------------------|--------|--------|--------|--------|--------|--------|--------|
| | | | | | | | Goal 1 | Goal 2 | Goal 3 | Goal 4 | Goal 5 | Goal 6 | Goal 7 | Goal 8 |
| Multi-Hazard #5 | Retrofit critical structures to protect them from seismic, floods, high winds, earthquakes, or other natural hazards. | MW&L | Public Works, Fire, Police, School District | General fund, utility rates, grants | H | Long | | | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Multi-Hazard #6 | Develop and maintain GIS mapped critical facility inventory | Engineering, MW&L | Planning, Fire, Police | General fund, grants | L | Short | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ |
| Multi-Hazard #7 | Develop and maintain GIS mapped hazard areas within the UGB. | Engineering, MW&L | Planning, Fire, Police | General fund, grants | L | Short | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ |
| Multi-Hazard #8 | Develop & construct multi-jurisdictional fuel station and mobile fuel capabilities | Engineering, MW&L | Planning, Fire, Police | MW&L, general fund | H | Short | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ |
| Multi-Hazard #9 | Develop & construct redundant community water source and supply | MW&L | Engineering, other cities, Yamhill Co. | Utility rates | H | Long | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ |
| Multi-Hazard #10 | Establish a process to coordinate with state and Federal agencies to maintain up-to-date hazard data, maps and assessments. | Planning | MW&L, Fire, Police, Public Works | General funds, grants | L | Short | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ |
| Multi-Hazard #11 | Limit (e.g. reduced density, etc.) or prohibit development in high hazard areas. | Planning | Engineering | General funds | L | Ongoing | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Multi-Hazard #12 | Encourage mitigation practices in developments at risk to natural hazards. | Planning | Engineering | General funds | L | Ongoing | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ |

| Natural Hazard Action ID | Action Item | Coordinating Organization (Lead) | Partners | Potential Funding | Cost | Timing | Plan Goals Addressed | | | | | | | |
|--------------------------|--|----------------------------------|--|---|------|---------|----------------------|--------|--------|--------|--------|--------|--------|--------|
| | | | | | | | Goal 1 | Goal 2 | Goal 3 | Goal 4 | Goal 5 | Goal 6 | Goal 7 | Goal 8 |
| Multi-Hazard #13 | Promote resilience, response, mitigation, and recovery planning for local businesses to continue operating after a disaster. | Administration | Planning, Public Works, Police, Fire, MW&L, Chamber, MDA, MEDP | General funds, grants, private investment | L | Ongoing | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |

Drought Actions

No actions Identified at this time

Earthquake Actions

| | | | | | | | | | | | | | |
|---------------|--|-------------------|--|-------------------------------------|---|---------|---|---|---|--|---|---|---|
| Earthquake #1 | Complete inventory and seismic assessment of critical facilities. | Engineering, MW&L | School District, Fire District, Planning | General funds, utility fees, grants | H | Short | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Earthquake #2 | Seismically retrofit (structural and nonstructural) identified high risk critical facilities and infrastructure to meet life safety standards in order to continue operations post-earthquake. | Engineering, MW&L | School District, Fire District, Planning | General fund, utility fees, grants | H | Long | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Earthquake #3 | Complete inventory & seismic assessment of public and commercial buildings that may be particularly vulnerable to earthquake damage. | Engineering, MW&L | Chamber, property owners | General fund, utility fees, grants | H | Short | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Earthquake #4 | Conduct outreach & training of local builders, architects, engineers and inspectors to develop post-earthquake building evaluation resources | Planning | Professional organization, contractors | General fund, permit fees | L | Ongoing | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |

| Natural Hazard Action ID | Action Item | Coordinating Organization (Lead) | Partners | Potential Funding | Cost | Timing | Plan Goals Addressed | | | | | | | |
|--------------------------|---|----------------------------------|----------------------------------|---|------|------------|----------------------|--------|--------|--------|--------|--------|--------|--------|
| | | | | | | | Goal 1 | Goal 2 | Goal 3 | Goal 4 | Goal 5 | Goal 6 | Goal 7 | Goal 8 |
| Earthquake #5 | Educate property owners about structural and non-structural retrofitting of vulnerable buildings and encourage retrofit. | Planning | FEMA, DLCD, OEM | General fund, permit fees | L | Ongoing | | ✓ | ✓ | ✓ | | | | |
| Earthquake #6 | Develop an outreach program to educate and encourage homeowners and tenants to secure furnishings, storage cabinets, and utilities to prevent injuries and damage. | Planning | FEMA, DLCD, OEM | General fund, permit fees | L | Ongoing | | ✓ | ✓ | ✓ | | | | |
| Flood Actions | | | | | | | | | | | | | | |
| Flood #1 | Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances. | Planning | Administration, Engineering | General fund | L | Ongoing | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Flood #2 | Work with FEMA to update FIRMs. Request DOGAMI debris flow and lidar data be included in FIRM updates. Use the updated FIRMS for land use and mitigation planning. | Planning | Public Works, FEMA, DOGAMI, DLCD | General fund, HMA | M | Mid-Term | ✓ | | ✓ | ✓ | | ✓ | | ✓ |
| Flood #3 | Inventory and improve drainage (e.g., culverts) to increase drainage capacity and efficiency. | Engineering | Planning, private developers | Stormwater utility fees, private investment | H | Long | ✓ | | ✓ | ✓ | | ✓ | | ✓ |
| Flood #4 | Develop and maintain GIS mapped critical facility inventory for all structures and residential and commercial buildings located within 100-year and 500-year floodplains. | Planning | Public Works, Engineering | Stormwater utility fees | L | Short Term | ✓ | | ✓ | ✓ | | ✓ | | ✓ |

| Natural Hazard Action ID | Action Item | Coordinating Organization (Lead) | Partners | Potential Funding | Cost | Timing | Plan Goals Addressed | | | | | | | |
|--|---|----------------------------------|------------------------------|---|----------|--------------|----------------------|--------|--------|--------|--------|--------|--------|--------|
| | | | | | | | Goal 1 | Goal 2 | Goal 3 | Goal 4 | Goal 5 | Goal 6 | Goal 7 | Goal 8 |
| Flood #5 | Establish flood mitigation priorities for critical facilities and residential and commercial buildings located within the 100- year floodplain using survey elevation data. | Engineering | Planning, Administration | General fund, HMA | H | Long Term | | | ✓ | ✓ | | ✓ | | ✓ |
| Landslide Actions | | | | | | | | | | | | | | |
| Landslide #1 | Utilize technology, geologic resources and other available data (such as DOGAMI LIDAR data) to identify and map potential areas for landslides - high, moderate and low. | Planning | DOGAMI, Engineering, MW&L | General fund, utility fees, grants | M | Short | ✓ | ✓ | ✓ | | | ✓ | | ✓ |
| Landslide #2 | Develop a process to limit future development in high landslide potential areas - permitting, geotechnical review, soil stabilization techniques, etc. | Planning | Engineering, MW&L | General fund, utility fees, grants | M | Short | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Landslide #3 | Development in steeply-sloped areas (greater than 15%) should be subject to specific development requirements to control erosion. | Planning | Engineering, MW&L | General fund, utility fees, grants | L | Short | | ✓ | ✓ | ✓ | | ✓ | | ✓ |
| Landslide #4 | Complete an inventory of locations where critical facilities, other buildings and infrastructure may be subject to landslides. | Planning | Engineering, MW&L | General fund, utility fees, grants | M | Short | | | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Severe Weather Actions (Windstorm and Winter Storms – Snow/Ice) | | | | | | | | | | | | | | |
| Severe Weather #1 | Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe winter storms. | Public Works | Engineering, MW&L | Utility fees | M | Ongoing | | ✓ | ✓ | ✓ | | ✓ | | ✓ |

| Natural Hazard Action ID | Action Item | Coordinating Organization (Lead) | Partners | Potential Funding | Cost | Timing | Plan Goals Addressed | | | | | | | |
|-------------------------------|--|----------------------------------|---|-------------------------------------|------|---------|----------------------|--------|--------|--------|--------|--------|--------|--------|
| | | | | | | | Goal 1 | Goal 2 | Goal 3 | Goal 4 | Goal 5 | Goal 6 | Goal 7 | Goal 8 |
| Severe Weather #2 | Review critical facilities and government building energy efficiency, winter readiness, and electrical protection capability. Identify, prioritize, and implement infrastructure upgrade or retrofit project prioritization and development. | Engineering, MW&L | Planning, Fire, Police, School District | General funds, utility fees, grants | H | Medium | | ✓ | | ✓ | | ✓ | | ✓ |
| Severe Weather #3 | Develop, implement, and maintain jurisdictional debris management plans | Public Works | MW&L, Planning, County EM | General funds, utility fees, grants | M | Short | | ✓ | ✓ | ✓ | | ✓ | | ✓ |
| Severe Weather #4 | Implement tree clearing mitigation programs to keep trees from threatening lives, property, and public infrastructure from severe weather events. | Public Works, MW&L | Planning, property owners | General funds, utility fees, grants | M | Ongoing | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Volcanic Event Actions | | | | | | | | | | | | | | |
| Volcanic Event #1 | Evaluate ash impact on utility infrastructure, transportation network, public facilities, including the airport, and develop mitigation actions. | Engineering | Public works, airport, MW&L, Police, Fire | General funds, utility fees, grants | M | Medium | | | | ✓ | ✓ | ✓ | | ✓ |
| Wildfire Actions | | | | | | | | | | | | | | |
| Wildfire #1 | Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan. | Fire | Planning, Emergency Management | General fund, ODF, grants | M | Ongoing | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Wildfire #2 | Provide wildland fire information in an easily distributed format for all residents. | Fire | Planning, Emergency | General fund, utility fees | L | Ongoing | ✓ | ✓ | ✓ | | | ✓ | | ✓ |

| Natural Hazard Action ID | Action Item | Coordinating Organization (Lead) | Partners | Potential Funding | Cost | Timing | Plan Goals Addressed | | | | | | | |
|--------------------------|---|----------------------------------|------------------------------|----------------------|------|--------|----------------------|--------|--------|--------|--------|--------|--------|--------|
| | | | | | | | Goal 1 | Goal 2 | Goal 3 | Goal 4 | Goal 5 | Goal 6 | Goal 7 | Goal 8 |
| | | | Management, MW&L | | | | | | | | | | | |
| Wildfire #3 | Develop, implement, and enforce vegetation management codes/plans to reduce wildfire risk. | Planning, Fire | Public Works, MW&L | General fund, grants | L | Short | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Wildfire #4 | Conduct residential audits for wildland and building fire hazard identification then develop an outreach program to disseminate the findings. | Fire | Planning, Public Works, MW&L | General fund, grants | L | Short | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Source: City of McMinnville steering committee, 2020.

Note: Full text of the plan goals referenced in this table is located on page MA-2.

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Risk Assessment

This section of the NHMP addendum addresses 44 CFR 201.6(b)(2) - Risk Assessment. In addition, this chapter can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards. Assessing natural hazard risk has three phases:

- **Phase 1:** Identify hazards that can impact the jurisdiction. This includes an evaluation of potential hazard impacts – type, location, extent, etc.
- **Phase 2:** Identify important community assets, and system vulnerabilities. Example vulnerabilities include people, businesses, homes, roads, historic places, and drinking water sources.
- **Phase 3:** Evaluate the extent to which the identified hazards overlap with or have an impact on, the important assets identified by the community.

The local level rationale for the identified mitigation strategies (action items) is presented herein, and within Volume I, Section 2, and Volume III, Appendix C. The risk assessment process is graphically depicted in Figure MA-1. Ultimately, the goal of hazard mitigation is to reduce the area of risk, where hazards overlap vulnerable systems.

Figure MA-1 Understanding Risk



Hazard Analysis

The McMinnville steering committee developed their hazard vulnerability assessment (HVA), using their previous HVA, and the County’s HVA as a reference. Changes from their previous HVA and the County’s HVA were made where appropriate to reflect distinctions in vulnerability, and risk from natural hazards unique to McMinnville, which are discussed throughout this addendum.

Table MA-2 shows the HVA matrix for McMinnville listing each hazard in order of rank from high to low. For local governments, conducting the hazard analysis is a useful step in planning for hazard mitigation, response, and recovery. The method provides the jurisdiction with sense of hazard priorities but does not predict the occurrence of a hazard.

One catastrophic hazard (Cascadia Subduction Zone earthquake) and two chronic hazards (winter storm and windstorm) rank as the top hazard threats to the City (Top Tier). The wildfire, drought, and crustal earthquake hazards comprise the next highest ranked hazards (Middle Tier), while the flood, landslide, and volcanic event hazards comprise the lowest ranked hazards (Bottom Tier).

Table MA-2 Hazard Analysis Matrix

| Hazard | Maximum | | Total Threat Score | Hazard Rank | Hazard Tiers | | |
|-----------------------|---------|---------------|--------------------|-------------|--------------|--------|-------------|
| | History | Vulnerability | | | | Threat | Probability |
| Winter Storm | 16 | 40 | 80 | 56 | 192 | #1 | Top Tier |
| Earthquake - Cascadia | 6 | 45 | 100 | 35 | 186 | #2 | |
| Windstorm | 16 | 25 | 70 | 56 | 167 | #3 | |
| Wildfire | 6 | 20 | 80 | 35 | 141 | #4 | Middle Tier |
| Drought | 8 | 15 | 50 | 56 | 129 | #5 | |
| Earthquake - Crustal | 6 | 25 | 70 | 21 | 122 | #6 | |
| Flood | 8 | 15 | 40 | 49 | 112 | #7 | Bottom Tier |
| Landslide | 6 | 15 | 50 | 35 | 106 | #8 | |
| Volcanic Event | 4 | 10 | 30 | 7 | 51 | #9 | |

Source: McMinnville steering committee, 2019-2020.

Table MA-3 categorizes the probability, and vulnerability scores from the hazard analysis for the City and compares the results to the assessment completed by the Yamhill County steering committee. Variations between the City, and County are noted in **bold** text within the city ratings.

Table MA-3 Probability and Vulnerability Comparison

| Hazard | McMinnville | | Yamhill County | |
|-----------------------|-----------------|-----------------|----------------|---------------|
| | Probability | Vulnerability | Probability | Vulnerability |
| Drought | High | Low | High | Moderate |
| Earthquake - Cascadia | Moderate | High | Moderate | High |
| Earthquake - Crustal | Low | Moderate | Low | Moderate |
| Flood | Moderate | Low | High | High |
| Landslide | Moderate | Low | High | Low |
| Volcanic Event | Low | Low | Low | Low |
| Wildfire | Moderate | Moderate | Low | Low |
| Windstorm | High | Moderate | High | Moderate |
| Winter Storm | High | High | High | High |

Source: McMinnville and Yamhill County steering committee, 2019-2020.

Community Characteristics

Table MA-4 and the following section provides information on City specific demographics, and assets. Many of these community characteristics can affect how natural hazards impact communities, and how communities choose to plan for natural hazard mitigation.

Considering the city specific assets during the planning process can assist in identifying appropriate measures for natural hazard mitigation. Between 2012 and 2019 the City grew by 1,495 people (5%).² According to the State's official coordinated population forecast, between 2019 and 2040 the City's population is forecast to grow by 38% to 46,956.³ *Note: the State is currently updating the official forecast and the proposed 2040 population is 42,457 which represents a 25% increase from 2019 population.*⁴ Median household income increased by 12% between 2012 and 2017.⁵

New development has complied with the standards of the [Oregon Building Code](#), and the city's development code including their floodplain ordinance.

Economy

The City of McMinnville is in the south-central portion of Yamhill County. McMinnville's commercial areas developed along primary routes and residential development followed nearby (see Figure MA-2).

McMinnville is the largest incorporated community in Yamhill County. There is significant economic activity happening within the City, making it a desirable place to live, work, and visit. Most workers residing in the city (62%, 9,291 people) travel outside of the city for work primarily to the Portland metro area, Salem, and Newberg.⁶ A significant population of people travel to the city for work, (77% of the workforce, 6,613 people) primarily from Salem, Portland metro area, Newberg, Sheridan, Dayton, Lafayette, Dundee, and Amity.

McMinnville residents are employed in a variety of occupations including professional (18%), management, business, and financial operations (14%), production (12%), office and administrative support (11%), and transportation and material moving (9%) occupations.⁷

The largest employers in the city as of 2019 are [employer (# of employees)]: Willamette Valley Medical Center (473), Linfield College (413), Cascade Steel Rolling Mills Inc. (408), Meggitt Polymers & Composites (377), Betty Lou's, Inc. (243), Oregon Mutual Insurance Company (191), World Class Technology (152), Skyline Homes (125), Wal-mart Stores, Inc. (109), Freelin Wade (108), and Northwest Unmanned Aviation Vehicles (NWUAV; 108).

² Portland State University, Population Research Center, "Annual Population Estimates", 2019.

³ Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 1 (2014-2017)". 2017.

⁴ Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 2 (2018-2020)". 2020 (proposed).

⁵ Social Explorer, Table T57, U.S. Census Bureau, 2013-2017 and 2008-2012 American Community Survey Estimates.

⁶ U.S. Census Bureau. LEHD Origin-Destination Employment Statistics (2002-2017). Longitudinal-Employer Household Dynamics Program, accessed on April 25, 2020 at <https://onthemap.ces.census.gov>.

⁷ Social Explorer, Table A17008, U.S. Census Bureau, 2013-2017 American Community Survey Estimates.

Table MA-4 Community Characteristics

| Population Characteristics | | |
|--|-----------------|------|
| 2012 Population | 32,435 | |
| 2019 Population | 33,930 | |
| 2040 Forecasted Pop. [Proposed]* | 46,956 [42,457] | |
| Race (non-hispanic) and Ethnicity (Hispanic) | | |
| White | | 72% |
| Black/ African American | | 1% |
| American Indian and Alaska Native | | < 1% |
| Asian | | 2% |
| Native Hawaiian and Other Pacific Islander | | < 1% |
| Some Other Race | | < 1% |
| Two or More Races | | 3% |
| Hispanic or Latino | | 22% |
| Limited or No English Spoken | 2,803 | 9% |
| Vulnerable Age Groups | | |
| Less than 15 Years | 7,180 | 22% |
| 65 Years and Over | 5,608 | 17% |
| Disability Status | | |
| Total Population | 5,687 | 17% |
| Children | 602 | 7% |
| Seniors | 2,108 | 39% |
| Income Characteristics | | |
| Households by Income Category | | |
| Less than \$15,000 | 1,339 | 11% |
| \$15,000-\$29,999 | 2,059 | 17% |
| \$30,000-\$44,999 | 1,916 | 16% |
| \$45,000-\$59,999 | 1,905 | 15% |
| \$60,000-\$74,999 | 1,216 | 10% |
| \$75,000-\$99,999 | 1,646 | 13% |
| \$100,000-\$199,999 | 1,893 | 15% |
| \$200,000 or more | 402 | 3% |
| Median Household Income | \$50,299 | |
| Poverty Rates | | |
| Total Population | 5,173 | 16% |
| Children | 1,731 | 22% |
| Seniors | 249 | 5% |
| Housing Cost Burden | | |
| Owners with Mortgage | 1,201 | 16% |
| Renters | 2,539 | 51% |

Source: U.S. Census Bureau, 2013-2017 American Community Survey; Portland State University, Population Research Center, "Annual Population Estimates", 2019. Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 1 (2014-2017)". 2017. and "Oregon Population Forecast Program Cycle 2 (2018-2020)". 2020 (proposed).

| Housing Characteristics | | |
|----------------------------|-------|-----|
| Housing Units | | |
| Single-Family | 8,382 | 64% |
| Multi-Family | 3,007 | 23% |
| Mobile Homes | 1,700 | 13% |
| Year Structure Built | | |
| Pre-1970 | 2,866 | 22% |
| 1970-1989 | 4,075 | 31% |
| 1990-2009 | 5,799 | 44% |
| 2010 or later | 349 | 3% |
| Housing Tenure and Vacancy | | |
| Owner-occupied | 7,362 | 56% |
| Renter-occupied | 5,014 | 38% |
| Seasonal | 77 | 1% |
| Vacant | 636 | 5% |

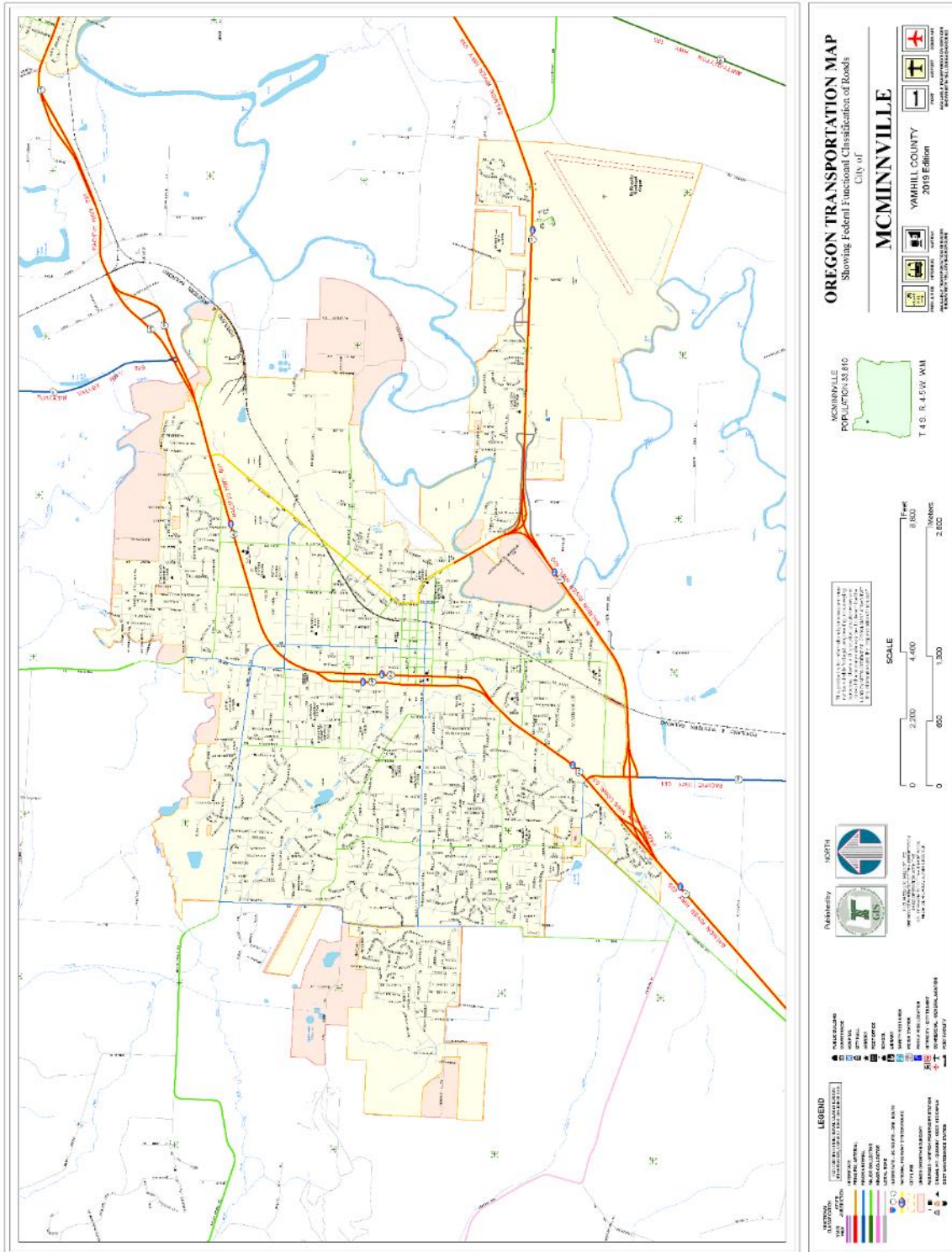
The Willamette River is approximately 6 miles east of the city and there are three drainage basins within the city: North Yamhill River, South Yamhill River, Baker Creek, North and West Cozine Creek.

McMinnville is generally flat with more hilly areas to the west. Its soils are moderately well-drained to well drained silt loams primarily of the Amity and Woodburn series. The area that is not urbanized is cultivated or comprised of small grains, grass, pasture plant, scattered Oak, and Douglas Fir.

McMinnville's temperatures range from a monthly average low of 34-38°F in the winter months to average highs of 75-83°F in the summer months. The coolest months are December-February and the warmest months are July and August. The average annual precipitation is about 42 inches and approximately 73% falls between November and March.

The City has an educated population with 86% of residents 25 years, and older holding a high school degree, 24% have a bachelor's degree or higher. The McMinnville School District has a 91% graduation rate as of 2019. McMinnville includes industrial and commercial development but is zoned primarily residential.

Figure MA-2 Oregon Transportation Map: City of McMinnville



Source: Oregon Department of Transportation

Community Assets

This section outlines the resources, facilities, and infrastructure that, if damaged, could significantly impact the public safety, economic conditions, and environmental integrity of McMinnville.

Critical facilities and infrastructure are those that support government and first responders' ability to act in an emergency. They are a top priority in any comprehensive hazard mitigation plan. These include locally designated shelters and other essential assets, such as fire stations, and water and wastewater treatment facilities (see Table MA-5). **Essential facilities and infrastructure** are those that support the continued delivery of key government services, and/or that may significantly impact the public's ability to recover from the emergency. These facilities may include: City buildings and other public facilities such as schools. MW&L infrastructure and facilities are shown on pages MA-26 to 27.

It is important to note that the facilities identified as "critical" and "essential" are characterized differently than the structural code that identifies buildings as "essential" and "non-essential." The structural code uses different language and criteria and therefore have completely different meanings than the buildings identified in this addendum.

Table MA-5 Critical and Essential Facilities

| Facility Name | Address | |
|--|-----------------------------------|-----------|
| Government See <i>Table MA-6 for information on seismic vulnerability.</i> | | |
| City Hall | 230 NE 2nd St. | Critical |
| Community Development Center | 231 NE 5th St. | Essential |
| Public Works | 1900 NE Riverside Drive | Critical |
| Water Reclamation Facility (back up EOC) | 3500 NE Clearwater Drive | Critical |
| Civic Hall | 200 NE 2nd Street | Essential |
| Library | 225 NW Adams | Essential |
| Community Center (Shelter) | 600 NE Evans | Critical |
| McMinnville Senior Center (Shelter) | 2250 NE McDaniel Lane | Critical |
| Collections Shop | 3450 NE Clearwater Drive | Critical |
| See section below for information on Water and Wastewater Infrastructure | | |
| Yamhill County Facilities | | |
| Yamhill County Sheriff's Office / Jail | 535 NE 5th St. | Critical |
| Yamhill County Emergency Management | 414 NE Evans Street | Critical |
| Yamhill County Public Works | 2060 NE Lafayette Ave | Critical |
| Yamhill County Fairgrounds (Shelter) | 2070 NE Lafayette Ave | Critical |
| Riverbend Landfill / Waste Management (private) | 13469 SE Hwy 18 (outside city) | Critical |
| Oregon State Facilities | | |
| ODOT Maintenance Station | 1502 Hwy 99W | Critical |
| Emergency Response | | |
| McMinnville Police Department (EOC) | 121 SW Adams St. | Critical |

| | | |
|---|------------------------|-----------|
| McMinnville Fire Department | 175 SE 1st St. | Critical |
| Yamhill Communications Agency (YCOM) | 121 SW Adams | Critical |
| Oregon State Facilities | | |
| Oregon State Police/FAA | 3975 NE Cirrus Ave | Critical |
| McMinnville Armory | 333 Armory Way | Critical |
| Educational (Public) | | |
| McMinnville SD 40 (Admin Office) | 800 NE Lafayette Ave | Essential |
| Grandhaven Elementary School | 3200 NE McDonald Ln. | Essential |
| Columbus Elementary School | 1600 SW Fellows | Essential |
| Memorial Elementary School | 501 W 14th St. | Essential |
| Newby Elementary School | 1125 W 2nd St. | Essential |
| Sue Buel Elementary | 1985 SE Davis | Essential |
| Duniway Middle School (Shelter) | 575 NW Michelbook Ln. | Critical |
| Patton Middle School (Shelter) | 1175 E 19th St. | Critical |
| McMinnville High School (Shelter) | 615 E 15th St. | Critical |
| Educational (Private/Charter/Montessori, etc.) | | |
| McMinnville Adventist Christian School | 1349 NW Elm St. | Essential |
| St James Catholic School (Shelter) | 206 NE Kirby St. | Critical |
| St John Lutheran School | 2142 NE McDonald Ln. | Essential |
| Bethel Christian School | 325 NW Baker Creek Rd. | Essential |
| International Community School | 533 NW Adams St. | Essential |
| McMinnville Montessori School | 1101 SE Brooks St. | Essential |
| Colleges/Universities | | |
| Linfield College | 900 SE Baker St. | |
| Chemeketa Community College | 288 NE Norton | |
| Medical Care Facilities | | |
| McMinnville Immediate Health Care | 207 NE 19th St | Critical |
| Physicians Medical Center | 2435 NE Cumulus Ave | Critical |
| Virginia Garcia Memorial Health Center | 115 NE May Lane | Critical |
| West Hills Healthcare Clinic | 2163 NW 2nd St | Critical |
| Willamette Valley Medical Center | 2700 SE Stratus Avenue | Critical |
| Community Assets | | |
| First Baptist Church (Shelter) | 125 SE Cowsls St | Critical |
| Hillside Retirement Community (Shelter) | 900 NW Hill Road | Critical |
| Seventh Day Adventist Church (Shelter) | 1500 Old Sheridan Road | Critical |
| True Vine Christian Fellowship (Shelter) | 118 NE 4th St | Critical |
| Transportation | | |
| First Student Inc. (school busses) | 1936 NE Lafayette Ave | Critical |
| Yamhill County Transit Center | 800 NE 2nd St | Critical |

Transportation/Infrastructure

Mobility plays an important role in McMinnville, and the daily experience of its residents, and businesses. Motor vehicles represent the dominant mode of travel through, and within McMinnville. McMinnville is served by Yamhill County Transit among other transit providers.

Infrastructure that provides critical and essential services include:

Railroads

Railroads are major providers of regional and national cargo and trade flows. Railroads run through the Northern Willamette region provide vital transportation links from the Pacific to the rest of the country. The Portland & Western (PNWR) provides freight service to/from the city. There is no passenger rail service in the city.

Rails are sensitive to icing from the winter storms that can occur in the Northern Willamette region. For industries in the region that utilize rail transport, these disruptions in service can result in economic losses. The potential for rail accidents caused by natural hazards can also have serious implications for the local communities if hazardous materials are involved.

Airports

The city has no commercial service airports, however Portland International Airport (PDX), the largest and busiest airport in the state, is in nearby Multnomah County. There is one public airport: McMinnville Municipal Airport located in the southeast portion of the City along the Salmon River Hwy (OR 18)/SE McMinnville Bypass.

Roads/Seismic lifelines

Oregon Highway 99W is the major north-south transportation route, and Oregon Highway 18 (Salmon River Highway) is the major east-west transportation route, through the city. Oregon Highway 47, 2nd Street, Wallace Road, Hill Road, Baker Street, Fellows Street, and Lafayette Avenue are other major transit routes in the city (see Figure MA-2).

Seismic lifeline routes help maintain transportation facilities for public safety and resilience in the case of natural disasters. Following a major earthquake, it is important for response and recovery agencies to know which roadways are most prepared for a major seismic event. The Oregon Department of Transportation has identified lifeline routes to provide a secure lifeline network of streets, highways, and bridges to facilitate emergency services response after a disaster.⁸

System connectivity and key geographical features were used to identify a three-tiered seismic lifeline system. Routes identified as Tier 1 are considered the most significant and necessary to ensure a functioning statewide transportation network. The Tier 2 system provides additional connectivity to the Tier 1 system, it allows for direct access to more locations and increased traffic volume capacity. The Tier 3 lifeline routes provide additional connectivity to the systems provided by Tiers 1 and 2.

The Lifeline Routes in McMinnville:

⁸ Oregon Department of Transportation. Oregon Seismic Lifeline Evaluation, Vulnerability Synthesis, and Identification, *Oregon Seismic Lifeline Routes*, May 15 2012. Page 6-4 figure 6-1. Accessed September 12, 2019.

- Tier I: Hwy 18 southwest of McMinnville, Hwy 99W northeast of McMinnville.
- Tier II: Hwy 99W south of McMinnville
- Tier III: None

Bridges

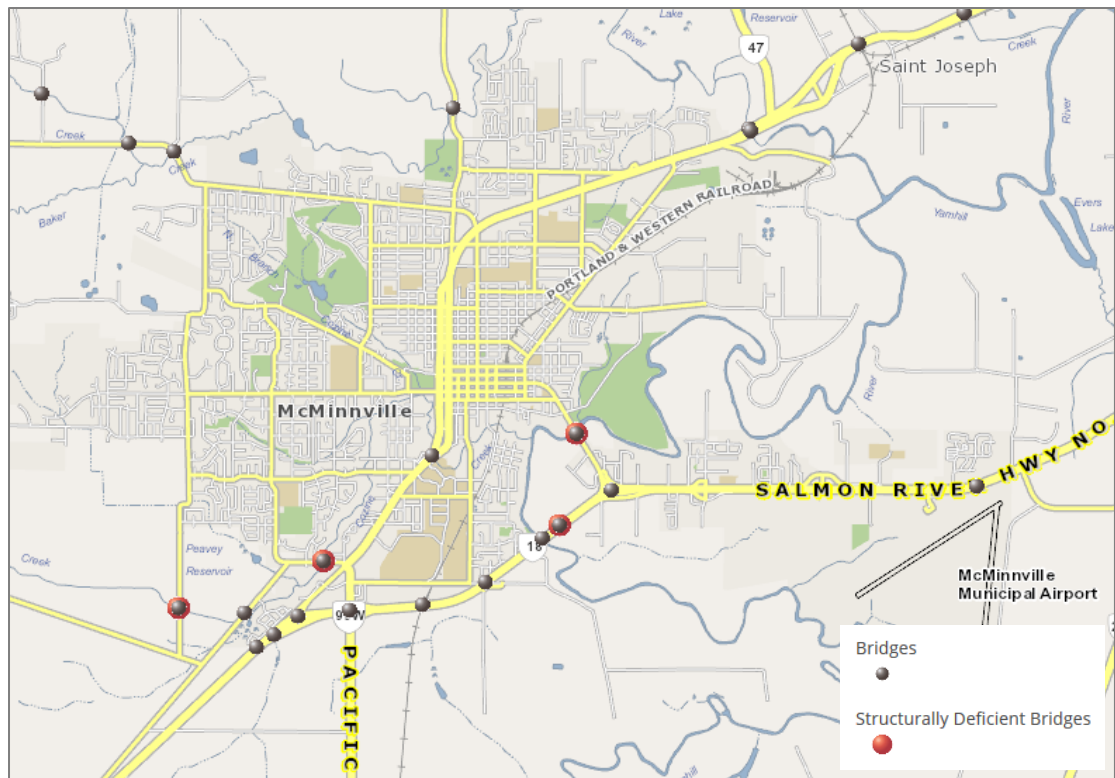
Because of earthquake risk, the seismic vulnerability of the city’s bridges is an important issue. Non-functional bridges can disrupt emergency operations, sever lifelines, and disrupt local and freight traffic. These disruptions may exacerbate local economic losses if industries are unable to transport goods. Bridges within the city that are critical or essential include (see Figure MA-3):

- Old Sheridan Rd (City)
- Cozine Creek, Old Sheridan Rd (ODOT 00315F) – *structurally deficient*
- 3 Mile Lane Bridge (ODOT) – *structurally deficient*
- Hwy 99 north (ODOT)
- Hwy 99 south (ODOT)
- Hwy 18-S. Yamhill River (ODOT 08492) - *structurally deficient*
- Hwy 18-S. Yamhill floodplain (ODOT 06758) *structurally deficient*

Overpasses

- 3 Mile Lane over Hwy 18 (ODOT)
- Hwy 18 off ramp over Hwy 18 (ODOT)
- Hwy 18 over RR crossing (ODOT)
- Booth Bend Road over Hwy 18 (ODOT)
- Hwy 99 over Hwy 18 (ODOT)

Figure MA-3 Oregon Bridges and Structurally Deficient Bridges



Source: Oregon Department of Transportation, ODOT TransGIS, accessed April 27, 2020

Utility lifelines are the resources that the public relies on daily such as, electricity, fuel and communication lines. If these lines fail or are disrupted, the essential functions of the community can become severely impaired. Utility lifelines are closely related to physical infrastructures, like dams and power plants, as they transmit the power generated from these facilities.

Generally, the network of electricity transmission lines running throughout the city is operated by McMinnville Water & Light. The Williams Gas Pipeline provides natural gas that is delivered to customers in the city by Northwest Natural Gas. These lines may be vulnerable as infrequent natural hazards, like earthquakes, could disrupt service to natural gas consumers across the region.

The city water, wastewater, and stormwater (culvert) systems include the following:

McMinnville Water and Light Infrastructure

- McMinnville Water & Light, Office, 855 NE Marsh Ln, Essential
- McGuire Dam/Reservoir, 28656 NW Meadowlake Rd, Yamhill (outside City), Critical
- Haskins Dam, 23130 NW Haskins Cr Rd, Yamhill (outside City), Critical
- Fox Ridge Reservoirs, 12300 NW Fox Ridge Rd (outside City), Critical
- Water Treatment Plant, 23100 NW Haskins Cr Rd, Yamhill (outside City), Critical
- High Heaven Lookout, 6660 NW High Heaven Rd, Critical
- Baker Creek substation, 1901 NW Baker Creek Rd, Essential
- Booth Bend substation, 4591 SE Booth Bend Rd, Essential
- Cascade substation, 3250 NE Hwy 99W, Essential
- East McMinnville substation, 1880 NE Riverside Dr, Essential
- Gormley substation, 10120 Hwy 18, Essential
- Walnut City substation, 1945 NW 2nd St, Essential

Wastewater Infrastructure

- Wastewater Treatment Plant, 3500 NE Clearwater Drive, Critical
- Wastewater Diversion Structure, 1900 NE Riverside Drive, Critical
- Wastewater Lafayette Overflow 1220 NE Lafayette Ave, Critical
- Wastewater Outfall-Yamhill River 5115 NE Riverside Drive, Critical
- 3-Mile Lane #1 Pump Station (PS), 2005 NE Cumulus Way, Critical
- 3-Mile Lane #3 PS, 3305 NE 3-Mile Lane, Critical
- Autumn Ridge PS, 599 NE Summerfield Street, Critical
- Cozine PS, 325 SE Irvine, Critical
- Cozine Woods PS, 1355 SW Old Sheridan, Critical
- Crestbrook PS, 1045 NW Baker Crest Ct., Critical
- Kathleen Manor PS, 1835 SW Alexandria, Critical
- Morgan Lane PS, 1655 SE Morgan Lane, Critical
- Northeast PS, 3395 NE Daffodil Dr., Critical
- Oregon Street PS, 200 SE Oregon Street, Critical
- Raw Sewage PS & diversion structure, 1950 NE Riverside Drive, Critical
- Riverside Drive PS, 4015 NE Riverside Drive, Critical
- Westside PS, 2850 NE Baker Street, Critical

Culverts

- 2nd Street, Critical
- Elmwood, Critical
- Michelbook, Critical
- Davis Street, Critical
- Ford Street, Essential
- Fellows Street, Critical
- Fleishauer Lane, Essential
- Cypress Street, Essential

Environmental Assets/Parks:

Environmental assets are those parks, green spaces, wetlands, and rivers that provide an aesthetic, and functional ecosystem services for the community include:

| | |
|----------------------------------|--------------------------------------|
| Bend-O-River Mini-Park | Riverside Drive Dog Park |
| Chegwyn Farms Neighborhood Park | Rotary Nature Preserve at Tice Woods |
| City Park | Taylor Park |
| Discovery Meadows Community Park | Thompson Park |
| Galen McBee Airport Park | West Hills Neighborhood Park |
| Heather Hollow | West McMinnville Linear Park |
| Joe Dancer Park | Westside Bicycle/Pedestrian |
| Kingwood Mini-Park | Greenway |
| Kiwanis Park | Wortman Park |
| North Evans Mini-Park | Jay Pearson Park) |

Vulnerable Populations:

Vulnerable populations, including seniors, disabled citizens, women, and children, as well those people living in poverty, often experience the impacts of natural hazards and disasters more acutely. Populations that have special needs or require special consideration include:

Child Care Facilities

| | |
|--|---------------------------------|
| Bear Hugs Child Development Center | Madrona Childcare |
| Calico Cat Childcare | Nadines Childcare |
| Care for Kids | Noah's Ark Daycare |
| Carolyns Childcare | St James School Extended Care |
| Chysalis Children | Tender Loving Childcare |
| Grandma Chris Preschool and Daycare | Trinity Learning Center |
| Happy Face Daycare | Trinity Learning Daycare Center |
| Head Start of Yamhill Co McMinnville Ctr | Vickies Daycare |
| Helping Hands Daycare | West Hills Daycare |
| Little Friends of Hope Daycare | |

Adult Care Facilities

| | |
|----------------------------|---|
| Alterra Villas McMinnville | Brookdale Senior Living-Villa McMinnville |
|----------------------------|---|

Community Homecare Willamette Valley
Courtyard at Hillside Memory Care
Harmony Living
Life Care Center of McMinnville
Oakwood Home Services
Osprey Court Memory Care Community

Osprey Pointe Assisted Living Community
Parkland Village Assisted Living
Rock of Ages Mennonite Home
United Homecare Services
Virginia Garcia Memorial Health Center
Wynwood of McMinnville

Community, Cultural, and Historic Assets

The cultural and historic heritage of a community is more than just tourist charm. For families that have lived in the city for generations and new resident alike, it is the unique places, stories, and annual events that make McMinnville an appealing place to live. The cultural and historic assets are both intangible benefits and obvious quality-of-life-enhancing amenities. Because of their role in defining and supporting the community, protecting these resources from the impact of disasters is important. The following community, cultural, and historic resources can be found in the City:

Downtown McMinnville National
Register Historic District
Evergreen Aviation Museum

Northwest Senior & Disability Services
YCAP
Yamhill County Gospel Mission

A complete list of historic resources is located on the City website: [Link](#)

Hazard Characteristics

Drought

The steering committee determined that the City's probability for drought is **high**, and that their vulnerability to drought is **low**.

Volume I, Section 2 describes the characteristics of drought hazards, history, as well as the location, extent, and probability of a potential event. The spring/summer of 2018 was particularly dry period for the City. Due to the climate of Yamhill County, past, and present weather conditions have shown an increasing potential for drought.

The City of McMinnville is provided water by McMinnville Water and Light (MW&L) which owns 6,350 acres of watershed in the Coast Mountain Range approximately 9 miles northwest of the City. Water from the McGuire and Haskins Reservoirs (combined 3.5 billion gallons capacity) is treated at the water treatment facility that can treat up to 22 million gallons per day (mgd). Following treatment water flows via two 24-inch and 16-inch water transmission mains to four (4) water storage reservoirs (22.7 million gallons capacity) at Fox Ridge west of the city. MW&L has approximately 21 miles of transmission pipeline ranging from 16-inch to 48-inch and about 157 miles of distribution pipeline ranging in size from 2-inch to 36-inch.

MW&L has enough capacity to meet current and anticipated future demand.

For more information on McMinnville’s water supply visit their website: <https://www.mc-power.com/>

Vulnerability Assessment

Due to insufficient data and resources, McMinnville is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard. State-wide droughts have historically occurred in Oregon, and as it is a region-wide phenomenon, all residents are equally at risk. Structural damage from drought is not expected; rather the risks apply to humans and resources. Industries important to the City of McMinnville’s local economy such as agriculture, fishing, and timber have historically been affected, and any future droughts would have tangible economic and potentially human impacts.

The city’s existing water supply is most vulnerable to wildfire which may impact the MW&L watershed and is increased during periods of drought. The MW&L water transmission and distribution lines are vulnerable to seismic activity that could cause them to fail. There is a low chance that dams at McGuire and Haskins Reservoirs could be impacted by seismic activity.

Mitigation Activities

The City provides information on water conservation to McMinnville water customers. The City engages in other water conservation measures including water line leak detection and repair, replacement of deteriorating pipe, and replacement/repair of older and under-registering water meters and reducing dead end lines in order to increase water circulation throughout the system.

McMinnville Codes Pertaining to Droughts

The following McMinnville codes, plans, and policies pertain to droughts:

1. McMinnville Comprehensive Plan.
2. McMinnville Municipal Code
3. MW&L provides information on water conservation to residential customers ([link](#)).

Please review Volume I, Section 2 for additional information on this hazard.

Earthquake (Cascadia Subduction Zone)

The steering committee determined that the City’s probability for a Cascadia Subduction Zone (CSZ) earthquake is **moderate** and that their vulnerability to a CSZ earthquake is **high**.

Volume I, Section 2 describes the characteristics of earthquake hazards, history, as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect McMinnville as well. The causes, and characteristics of an earthquake event are appropriately described within the Volume I, Section 2 as well as the location, and extent of potential hazards. Previous occurrences are well documented within Volume I, Section 2, and the community impacts described by the County would generally be the same for McMinnville as well.

Within the Northern Willamette Valley are that includes Yamhill County, two potential faults and/or zones can generate high-magnitude earthquakes. These include the Cascadia

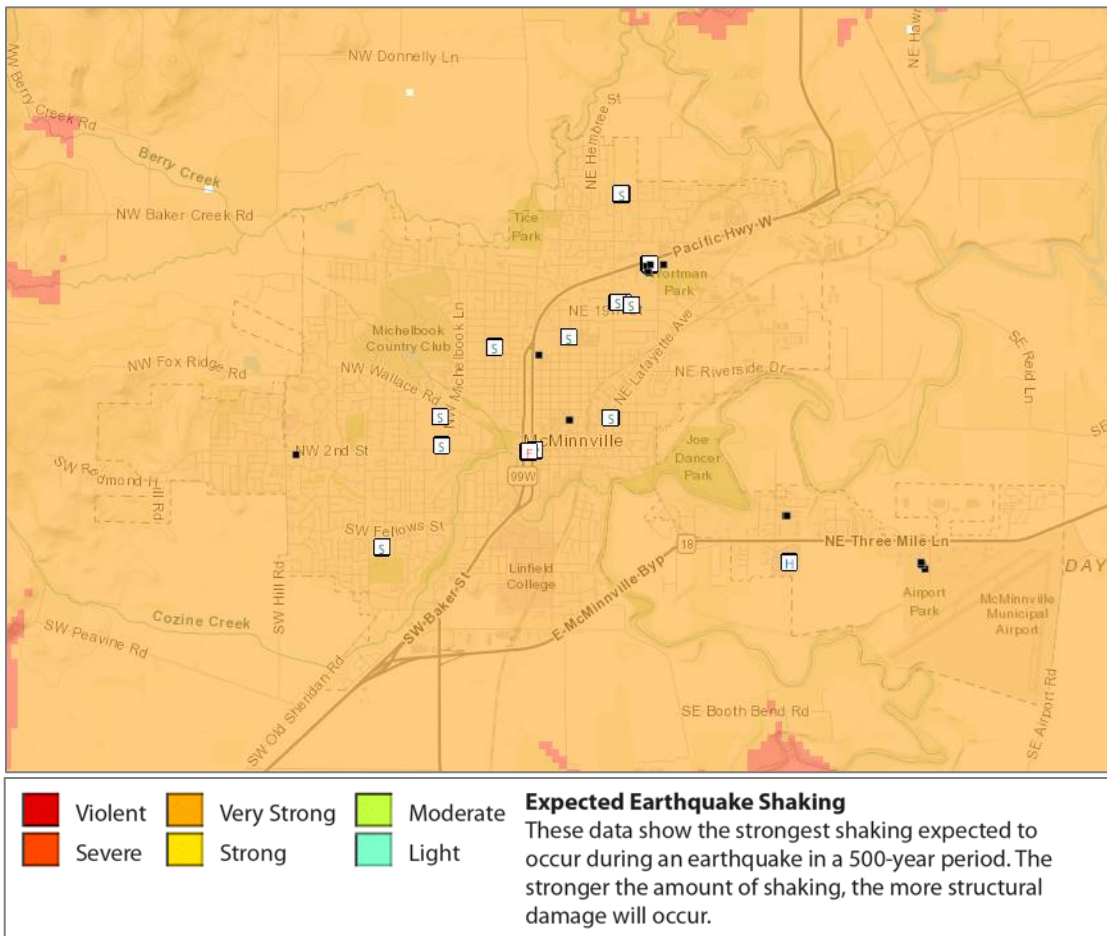
Subduction Zone and the Gales Creek-Newberg-Mt. Angel Structural Zone (including the Newberg Fault).

Cascadia Subduction Zone

The Cascadia Subduction Zone is a 680-mile-long zone of active tectonic convergence where oceanic crust of the Juan de Fuca Plate is subducting beneath the North American continent at a rate of 4 cm per year. Scientists have found evidence that 11 large, tsunami-producing earthquakes have occurred off the Pacific Northwest coast in the past 6,000 years. These earthquakes took place roughly between 300 and 5,400 years ago with an average occurrence interval of about 510 years. The most recent of these large earthquakes took place in approximately 1700 A.D.⁹

Figure MA-4 displays relative shaking hazards from a Cascadia Subduction Zone earthquake event. As shown in the figure, most of the City is expected to experience very strong (orange) shaking in a CSZ event.

Figure MA-4 Cascadia Subduction Zone Expected Shaking



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)
 Note: To view detail click the link above to access Oregon HazVu.

⁹ The Cascadia Region Earthquake Workgroup, 2005. Cascadia Subduction Zone Earthquakes: A magnitude 9.0 earthquake scenario. <http://www.crew.org/PDFs/CREWSubductionZoneSmall.pdf>

The city's proximity to the Cascadia Subduction Zone, potential slope instability, and the prevalence of certain soils subject to liquefaction, and amplification combine to give the City a high-risk profile. Due to the expected pattern of damage resulting from a CSZ event, the Oregon Resilience Plan divides the State into four distinct zones, and places McMinnville within the "Valley Zone" (Valley Zone, from the summit of the Coast Range to the summit of the Cascades). Within the Northwest Oregon region, damage, and shaking is expected to be strong, and widespread - an event will be disruptive to daily life, and commerce, and the main priority is expected to be restoring services to business and residents.

Earthquake (Crustal)

The steering committee determined that the City's probability for a crustal earthquake is **low** and that their vulnerability to crustal earthquake is **moderate**.

Volume I, Section 2 describes the characteristics of earthquake hazards, history (see below), as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect McMinnville as well. The causes, and characteristics of an earthquake event are appropriately described within Volume I, Section 2 as well as the location, and extent of potential hazards. Previous occurrences are well-documented within Volume I, Section 2, and the community impacts described by the County would generally be the same for McMinnville as well.

The 1993 Scotts Mill earthquake impacted McMinnville including damaging beyond repair the former building located where Columbus Elementary is now (constructed in 1995).

Figure MA-5 shows a generalized geologic map of the McMinnville area that includes the areas for potential regional active faults, earthquake history (1971-2008), and soft soils (liquefaction) hazard. The figure shows the areas of greatest concern within the City limits as red and orange. Except for portions of the west hills all the city is within the moderate earthquake liquefaction hazard zone. Areas just outside the UGB to the north and south are within the high earthquake liquefaction hazard zone. These areas are also in moderate and high landslide hazard zones and may be prone to earthquake induced landslides (see Figure MA-7).

Vulnerability Assessment (subduction zone and crustal)

Due to insufficient data and resources, McMinnville is currently unable to perform a quantitative risk assessment for this hazard.

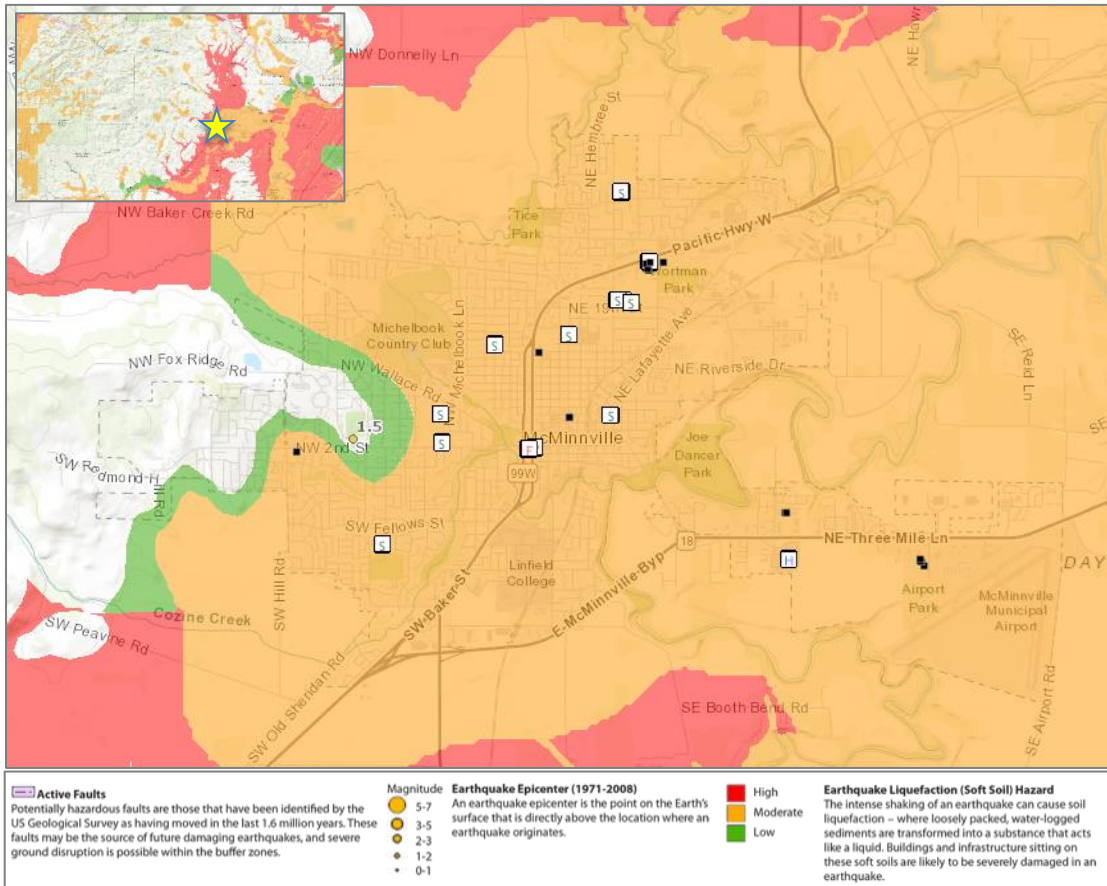
The western portion of Yamhill County is likely to experience higher levels of shaking than the eastern portion, as a result of its proximity to the Cascadia Subduction Zone.

The City of McMinnville is in the south-central portion of Yamhill County, in a region likely to experience strong shaking should a subduction zone or significant crustal earthquake occur. This rating represents the peak acceleration of the ground caused by the earthquake, and for a strong designation corresponds to 9-20 percent of the acceleration of gravity.

Ground movement in both areas, however, is likely to cause damage to weak, unreinforced masonry buildings, and to induce small landslides along unstable slopes. As well as landslide, earthquakes can trigger other hazards such as dam failure and disruption of transportation and utility systems.

Utility systems will be significantly damaged, including damaged buildings, and damage to utility infrastructure, including water treatment plants, and equipment at high voltage substations (especially 230 kV or higher which are more vulnerable than lower voltage substations). Buried pipe systems will suffer extensive damage with approximately one break per mile in soft soil areas. There would be a much lower rate of pipe breaks in other areas. Restoration of utility services will require substantial mutual aid from utilities outside of the affected area. Transportation systems (bridges, pipelines) are also likely to experience significant damage. There is a low probability that a major earthquake will result in failure of upstream dams.

Figure MA-5 Active Crustal Faults, Epicenters (1971-2008), and Soft Soils



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu.

Building codes were implemented in Oregon in the 1970s, however, stricter standards did not take effect until 1991 and early 2000s. As noted in the community characteristics section (Table MA-4), approximately 53% of residential buildings were built prior to 1990, which increases the City's vulnerability to the earthquake hazard. Information on specific public buildings' (schools and public safety) estimated seismic resistance, determined by DOGAMI in 2007, is shown in Table MA-6; each "X" represents one building within that ranking category. Of the facilities evaluated by DOGAMI, that have not been retrofitted, using their Rapid Visual Survey (RVS), one building has very high (100% chance) collapse potential and two (2) school buildings have a high (greater than 10% chance) collapse potential.

Table MA-6 Rapid Visual Survey Scores

| Facility | Site ID* | Level of Collapse Potential | | | |
|--|------------|--|---|-------------|------------------|
| | | Low (<1%) | Moderate (>1%) | High (>10%) | Very High (100%) |
| Schools | | | | | |
| District Offices (Cook Elem.) (800 NE Lafayette Ave) | Yamh_sch10 | Seismic retrofit per local bond | | | |
| Columbus Elementary (1600 SW Fellows) | Yamh_sch26 | X | | | |
| Grandhaven Elementary (3200 NE McDonald Ln) | Yamh_sch23 | X | | | |
| Memorial Elementary (501 W 14 th St) | Yamh_sch11 | | SRGP 2015-17 Phase II: \$692,688 | | |
| Newby Elementary (1125 W 2 nd St) | Yamh_sch12 | | SRGP 2015-17 Phase II: \$420,187 | | |
| Duniway Middle (575 Michelbook Ln) | Yamh_sch02 | X | | | |
| Patton Middle (1175 E 19 th St) | Yamh_sch14 | | X | X,X | |
| McMinnville High (615 E 15 th St) | Yamh_sch15 | | | | X |
| Public Safety | | | | | |
| Fire Department (175 E 1 st St) | Yamh_fir06 | | X | | |
| Oregon State Police (EOC) (130 NE Baker St) | Yamh_pol08 | | X | | |
| Yamhill Co. Sheriff's Office (535 NE 5 th St) | Yamh_pol02 | | | X | |
| ODOT Maintenance Station (1502 N Hwy 99W) | Yamh_pol06 | | X | | |
| Hospital | | | | | |
| Willamette Valley Medical Center (2700 SE Stratus Ave) | Yamh_hos01 | X | | | |

Source: [DOGAMI 2007. Open File Report 0-07-02. Statewide Seismic Needs Assessment Using Rapid Visual Assessment.](#) “*” – Site ID is referenced on the [RVS Yamhill County Map](#)

Note: The McMinnville Police Department was not assessed. The ODOT Maintenance Station was previously the Newberg-Dundee Police and 911 Call Center. Sue Buell Elementary was built in 2006 and not assessed. The District offices were previously Cook Elementary.

Mitigation Activities

Earthquake mitigation activities listed here include current mitigation programs and activities that are being implemented by McMinnville agencies or organizations.

A primary mitigation objective is to construct or upgrade critical and essential facilities and infrastructure to withstand future earthquake events. Seismic retrofit grant awards per the

[Seismic Rehabilitation Grant Program](#)¹⁰ have been funded to retrofit Adams School, McMinnville School District (2015-17, Phase II, grant award, \$1,500,000), Memorial Elementary, McMinnville School District (2015-17, Phase II, grant award, \$692,688), and Newby Elementary, McMinnville School District (2015-17, Phase II, grant award, \$420,187). Cook Elementary/School District Offices were retrofitted per a local bond in 2017. The McMinnville Fire Department has undergone a Level II seismic analysis in preparation for future seismic retrofit work.

The City of McMinnville fire department [website refers to](#) the Yamhill County [Community Emergency Response Team](#) (CERT) program that trains members in mitigation as well as preparedness and response. The City's Emergency Management Program works with community groups, businesses, residential facilities, and public and private schools in promoting earthquake preparedness and mitigation.

McMinnville Codes Pertaining to Earthquakes

The following McMinnville codes, plans, and policies pertain to earthquakes:

1. McMinnville Comprehensive Plan (*under contract to update in 2020*). The updated plan includes a Natural Hazards Inventory and Management Program Recommendations including information on earthquake and other geologic hazards impacting the city.
2. The City of McMinnville enforces the [Oregon Building Code](#) which includes provisions for earthquakes.

Please review Volume I, Section 2 for additional information on this hazard.

Flood

The steering committee determined that the City's probability for flood is **moderate** and that their vulnerability to flood is **low**.

Volume I, Section 2 describes the characteristics of flood hazards, history, as well as the location, extent, and probability of a potential event. Portions of McMinnville have areas of floodplains (special flood hazard areas, SFHA). These include areas include along the Yamhill River (South and North) and the West and North Forks of Cozine Creek, and Baker Creek (Figure MA-6).

For mitigation planning purposes, it is important to recognize that flood risk for a community is not limited only to areas of mapped floodplains. Other portions of McMinnville outside of the mapped floodplains may also be at relatively high risk from over bank flooding from streams too small to be mapped by FEMA or from local storm water drainage.

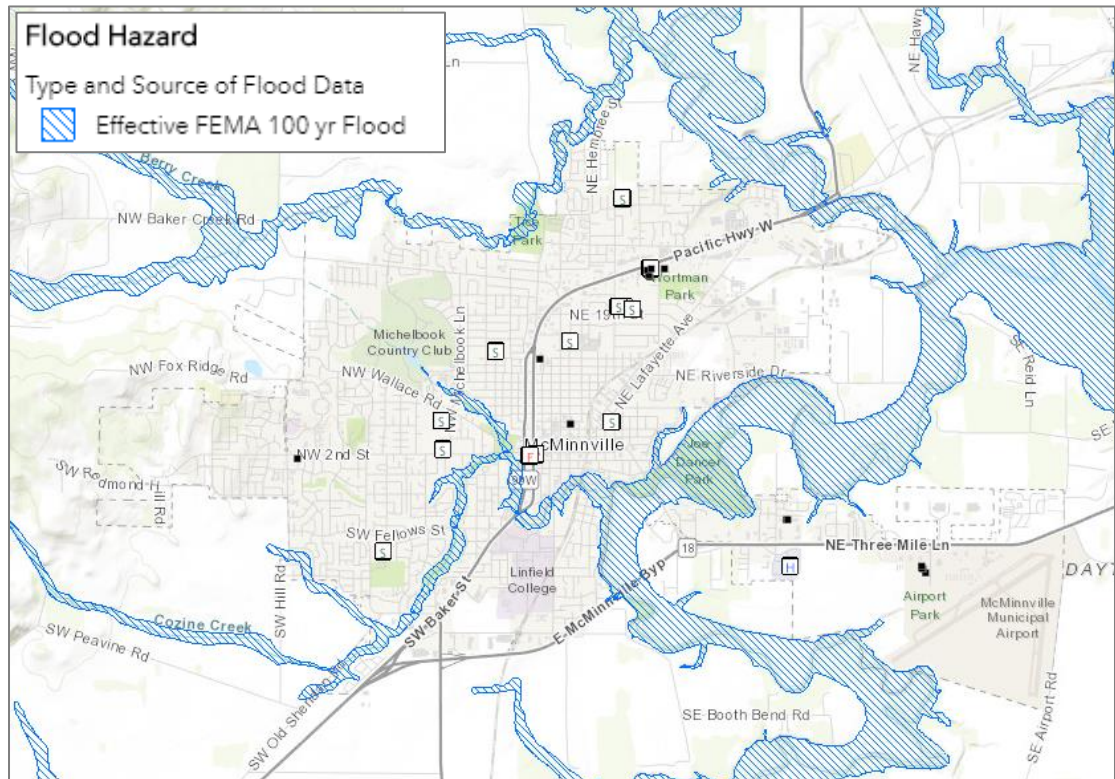
Floods can have a devastating impact on almost every aspect of the community, including private property damage, public infrastructure damage, and economic loss from business interruption. It is important for the City to be aware of flooding impacts and assess its level

¹⁰ The Seismic Rehabilitation Grant Program (SRGP) is a state of Oregon competitive grant program that provides funding for the seismic rehabilitation of critical public buildings, particularly public schools and emergency services facilities.

of risk. The City has been proactive in mitigating flood hazards by purchasing floodplain property.

The economic losses due to business closures often total more than the initial property losses that result from flood events. Business owners, and their employees are significantly impacted by flood events. Direct damages from flooding are the most common impacts, but indirect damages, such as diminished clientele, can be just as debilitating to a business.

Figure MA-6 Special Flood Hazard Area- update



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)
Note: To view detail click the link above to access Oregon HazVu.

Vulnerability Assessment

Due to insufficient data and resources, McMinnville is currently unable to perform a quantitative risk assessment for this hazard. FEMA FIRMs were used to outline the 100-year and 500-year floodplains for the City of McMinnville. The 100-year floodplain delineates an area of high risk, while the 500-year floodplain delineates an area of moderate risk. There is no residential development within the floodplain. Commercial and industrial development is largely on higher ground outside of the special flood hazard area (SFHS). Localized flooding can occur due to various factors including blocked stream channels or storm drains.

National Flood Insurance Program (NFIP)

FEMA's Flood Insurance Study (FIS), and Flood Insurance Rate Maps (FIRMs) are effective as of March 2, 2010. Table MA-7 shows that as of August 2019, McMinnville has 29 National Flood Insurance Program (NFIP) policies in force. Of those, four (4) are for properties that were constructed before the initial FIRMs. McMinnville's last Community Assistance Visit (CAV) was November 13, 1997. The City does not participate in the Community Rating

System (CRS). The table shows that most flood insurance policies are for residential structures, single-family homes, and there is one non-residential property insured. There has been one (1) paid flood insurance claims for \$223. The City complies with the NFIP through enforcement of their flood damage prevention ordinance and their floodplain management program.

Table MA-7 Flood Insurance Detail

| | Yamhill County | McMinnville |
|-----------------------------------|-----------------------|--------------------|
| Effective FIRM and FIS | 3/2/2010 | 3/2/2010 |
| Initial FIRM Date | - | 12/1/1982 |
| Total Policies | 446 | 29 |
| Pre-FIRM Policies | 153 | 4 |
| Policies by Building Type | | |
| Single Family | 401 | 28 |
| 2 to 4 Family | 14 | 0 |
| Other Residential | 10 | 0 |
| Non-Residential | 21 | 1 |
| Minus Rated A Zone | 72 | 0 |
| Insurance in Force | \$100,617,300 | \$8,452,700 |
| Total Paid Claims | 81 | 1 |
| Pre-FIRM Claims Paid | 68 | 1 |
| Substantial Damage Claims | 3 | 0 |
| Total Paid Amount | \$1,166,076 | \$223 |
| Repetitive Loss Structures | 4 | 0 |
| Severe Repetitive Loss Properties | 1 | 0 |
| CRS Class Rating | - | NP |
| Last Community Assistance Visit | - | 11/13/1997 |

Source: Department of Land Conservation and Development, August 2019. Repetitive Flood Loss information provided by FEMA correspondence on September 10, 2020. NP = Not Participating

The Community Repetitive Loss record for McMinnville identifies no Repetitive Loss Properties¹¹ or Severe Repetitive Loss Properties¹².

Mitigation Activities

Flood mitigation activities listed here include current mitigation programs and activities that are being implemented by McMinnville agencies or organizations.

¹¹ A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP.

¹² A Severe Repetitive Loss (SRL) property is a single family property (consisting of 1 to 4 residences) that is covered under flood insurance by the NFIP, and has incurred flood-related damage for which 4 or more separate claims payments have been paid under flood insurance coverage, with the amount of each claim payment exceeding \$5,000, and with cumulative amount of such claims payments exceeding \$20,000; or for which at least 2 separate claims payments have been made with the cumulative amount of such claims exceeding the reported value of the property.

McMinnville Codes Pertaining to Flooding

The following McMinnville codes, plans, and policies pertain to flooding:

1. McMinnville Comprehensive Plan (*under contract to update in 2020*). The updated plan includes a Natural Hazards Inventory and Management Program Recommendations including information on flood hazards impacting the city.
2. McMinnville Municipal Code [17.48 – Flood Area Zone](#). This portion of the Community Development Code implements the Goal 7 policies of the Comprehensive Plan and regulates development within the floodplain.

Please review Volume I, Section 2 for additional information on this hazard.

Landslide

The steering committee determined that the City's probability for landslide is **moderate** and that their vulnerability to landslide is **low** for the city as a whole, but that there were sections of the West Hills within the city limits that have high probability of landslides and the vulnerability to people and property in this section of the city is high.

Volume I, Section 2 describes the characteristics of landslide hazards, history, as well as the location, extent, and probability of a potential event within the region.

Landslide susceptibility exposure for McMinnville is shown in Figure MA-7. Approximately 8% of McMinnville has very high or high, and approximately 12% moderate, landslide susceptibility exposure.¹³ In general, the areas of greater risk are located adjacent to rivers and creeks (including the South Yamhill River and Cozine Creek). The area of the city that has the highest landslide susceptibility is in the west hills that has high and moderate landslide susceptibility (extending beyond the UGB and to the north and south along NW Fox Ridge Road in the north and SW Redmond Hill Road in the south). This area is sparsely developed currently which reduces the city's vulnerability, however, there is land within the city's UGB in this region. Development in these areas should consider strategies to reduce landslide hazard risk, including the prohibition of development in the highest risk areas. Please see the DLCD and DOGAMI publication [Preparing for Landslide Hazards, A Land Use Guide for Oregon Communities](#) (October 2019).

Potential landslide-related impacts are adequately described within Volume I, Section 2, and include infrastructure damages, economic impacts (due to isolation, and/or arterial road closures), property damages, and obstruction to evacuation routes. Rain-induced landslides, and debris flows can potentially occur during any winter, and thoroughfares beyond City limits are susceptible to obstruction as well. There are two mapped historic landslides in the city adjacent to the Cozine Creek: (1) south end of SE Evans St, damages included a broken 21-inch sanitary sewer trunk line that was replaced, and (2) northeast of Oak Grove Way east of SE Baker St, damages included a 1,000 gallon gasoline tank that was relocated.

The most common type of landslides are slides caused by erosion. Slides move in contact with the underlying surface, are generally slow moving, and can be deep. Rainfall-initiated

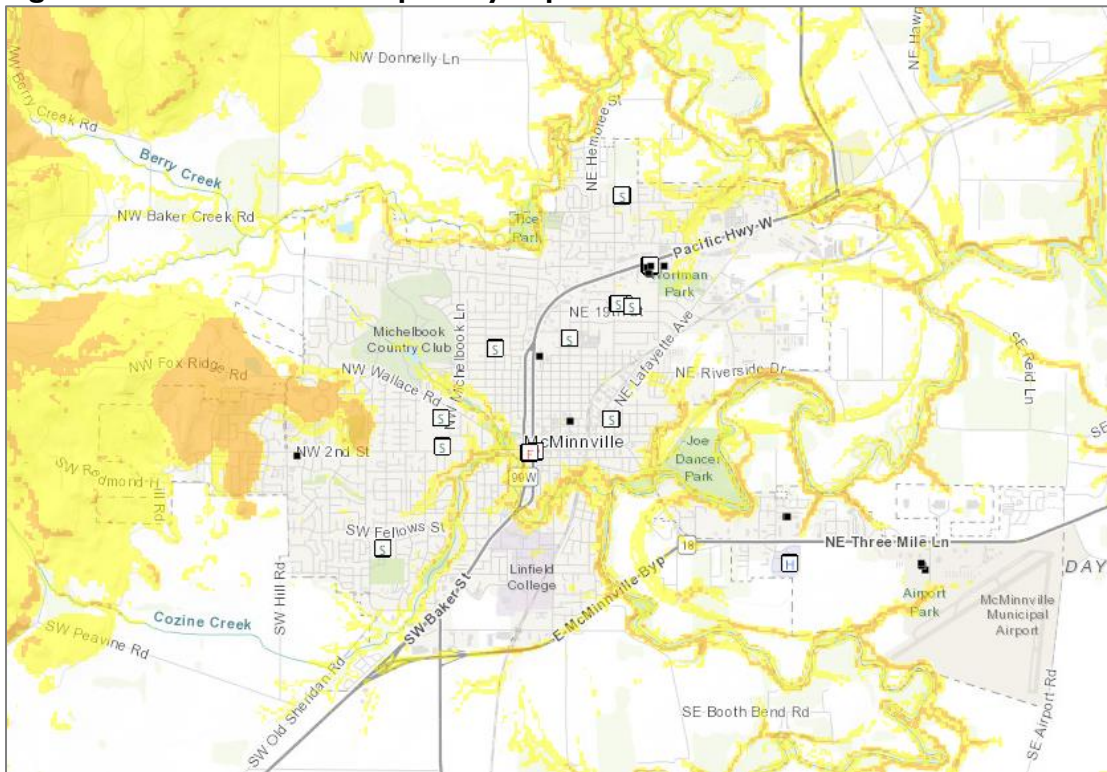
¹³ DOGAMI. [Open-File Report, O-16-02](#), *Landslide Susceptibility Overview Map of Oregon* (2016)

landslides tend to be smaller; while earthquake induced landslides may be quite large. All soil types can be affected by natural landslide triggering conditions.

Vulnerability Assessment

Due to insufficient data and resources, McMinnville is currently unable to perform a quantitative risk assessment for this hazard. DOGAMI completed a statewide landslide susceptibility assessment in 2016 ([O-16-02](#)), general findings from that report are provided above and within Figure MA-7.

Figure MA-7 Landslide Susceptibility Exposure



| | |
|-----------|---|
| Low | Landsliding unlikely. Areas classified as Landslide Density = Low (less than 7%) and areas classified as Slopes Prone to Landsliding = Low. |
| Moderate | Landsliding possible. Areas classified as Landslide Density = Low to Moderate (less than 17%) and areas classified as Slopes Prone to Landsliding = Moderate OR areas classified as Landslide Density = Moderate (7%-17%) and areas classified as Slopes Prone to Landsliding = Low. |
| High | Landsliding likely. Areas classified as Landslide Density = High (greater than 17%) and areas classified as Slopes Prone to Landsliding = Low and Moderate OR areas classified as Landslide Density = Low and Moderate (less than 17%) and areas classified as Slopes Prone to Landsliding = High. |
| Very High | Existing landslides Landslide Density and Slopes Prone to Landsliding data were not considered in this category. Note: the quality of landslide inventory (existing landslides) mapping varies across the state. |

Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu

Response and recovery efforts will likely vary from minor cleanup to more extensive utility system rebuilding. Utility disruptions are usually local and terrain dependent. Damages may require reestablishing electrical, communication, and gas pipeline connections occurring from specific breakage points. Initial debris clearing from emergency routes and

high traffic areas may be required. Water and wastewater utilities may need treatment to quickly improve water quality by reducing excessive water turbidity and reestablishing waste disposal capability.

Mitigation Activities

Landslide mitigation activities listed here include current mitigation programs and activities that are being implemented by the City of McMinnville agencies or organizations.

City of McMinnville Codes Pertaining to Landslides

The following McMinnville codes, plans, and policies pertain to landslides:

1. McMinnville Comprehensive Plan (*under contract to update in 2020*). The updated plan includes a Natural Hazards Inventory and Management Program Recommendations including information on landslide and other geologic hazards impacting the city.
2. The City of McMinnville enforces the [Oregon Building Code](#) which includes provisions that address the potential for geologic hazards including landslides.

Please review Volume I, Section 2 for additional information on this hazard.

Severe Weather

Severe weather can account for a variety of intense, and potentially damaging hazard events. These events include windstorms and winter storms. The following section describes the unique probability, and vulnerability of each identified weather hazard.

Windstorm

The steering committee determined that the City's probability for windstorm is **high** and that their vulnerability to windstorm is **moderate**.

Volume I, Section 2 describes the characteristics of windstorm hazards, history, as well as the location, extent, and probability of a potential event within the region. Because windstorms typically occur during winter months, they are sometimes accompanied by flooding and winter storms (ice, freezing rain, and very rarely, snow). Other severe weather events that may accompany windstorms, including thunderstorms, hail, lightning strikes, and tornadoes are generally negligible for McMinnville.

Volume I, Section 2 describes the impacts caused by windstorms, including power outages, downed trees, heavy precipitation, building damages, and storm-related debris. Additionally, transportation, and economic disruptions result as well.

Damage from high winds generally has resulted in downed utility lines, and trees usually limited to several localized areas. Electrical power can be out anywhere from a few hours to several days. Outdoor signs have also suffered damage. If the high winds are accompanied by rain (which they often are), blowing leaves, and debris clog drainage-ways, which in turn may cause localized urban flooding.

Please review Volume I, Section 2 for additional information on this hazard.

Winter Storm (Snow/Ice)

The steering committee determined that the City's probability for winter storm is **high** and that their vulnerability to winter storm is **high**.

Volume I, Section 2 describes the characteristics of winter storm hazards, history, as well as the location, extent, and probability of a potential event within the region. Severe winter storms can consist of rain, freezing rain, ice, snow, cold temperatures, and wind. They originate from troughs of low pressure offshore that ride along the jet stream during fall, winter, and early spring months. Severe winter storms affecting the City typically originate in the Gulf of Alaska or in the central Pacific Ocean. These storms are most common from November through March.

Vulnerability Assessment

Due to insufficient data and resources, McMinnville is currently unable to perform a quantitative risk assessment, or exposure analysis, for the windstorm and winter storm hazards. All areas within the City of McMinnville are equally at risk of a windstorm or winter storm event.

Mitigation Activities

The City works to mitigate problems regarding windstorm and winter storm issues when they arise. Mitigation activities listed here include current mitigation programs and activities that are being implemented by McMinnville agencies or organizations.

- ODOT is responsible for plowing, sanding, and de-icing state managed roads including: OR 99W within city limits.
- The City is responsible for plowing, sanding and de-icing designated roadways as per the City's [Snow and Ice Response Plan](#).
- The City requires that all new utility lines, cables or wires, on new development be placed underground.
- The City provides education on winter weather preparedness
- The City encourages property owners to trim hazard trees, and to maintain trees within public rights-of-way. Utility companies maintain trees along their utility easements.

City of McMinnville Codes Pertaining to Windstorms and Winter Storms

The following McMinnville codes, plans, and policies pertain to windstorms and winter storms:

1. The City of McMinnville Municipal Code Title 13 Public Utilities provides standards for public infrastructure and utilities.
2. The City of McMinnville enforces the [Oregon Building Code](#) which regulates building material requirements and includes provisions for windstorms and winter storms.

Please review Volume I, Section 2 for additional information on this hazard.

Volcanic Event

The steering committee determined that the City's probability for a volcanic event is **low** and that their vulnerability to a volcanic event is **low**.

Volume I, Section 2 describes the characteristics of volcanic hazards, history, as well as the location, extent, and probability of a potential event within the region. Generally, an event

that affects the Eastern portion of the County is likely to affect McMinnville as well. Several volcanoes are located near McMinnville, the closest of which are Mount Hood, Mount Adams, Mount Saint Helens, Mount Rainier, and the Three Sisters.

Due to McMinnville's relative distance from volcanoes, the city is unlikely to experience the immediate effects that eruptions have on surrounding areas (i.e., mud and debris flows, or lahars). Although the City of McMinnville is unlikely to experience lahars or lava flows, tephra (sand- sized or finer particles of volcanic rock that is ejected rapidly into the air from volcanic vents) drifts downwind from the explosions and can form a blanket-like deposit of ash. The eruption of Mount St. Helens in 1980, for example, coated the Willamette Valley with a fine layer of ash. If Mount Hood erupts, however, the city could experience a heavier coating of ash. Tephra is a public health threat, and can damage agriculture and transportation systems (i.e., aircraft and on- the-ground vehicles). Tephra can also clog drainage systems and create major debris management problems. Within McMinnville, public health would be a primary concern, and keeping transportation routes open/accessible would be important as well.

Vulnerability Assessment

Due to insufficient data and resources, McMinnville is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard.

Mitigation Activities

The existing volcanic event hazard mitigation activities are conducted at the county, regional, state, and federal levels and are described in the Yamhill County NHMP.

City of McMinnville Codes Pertaining to Volcanic Events

The City does not have specific codes, plans, or policies that pertain to volcanic events:

Please review Volume I, Section 2 for additional information on this hazard.

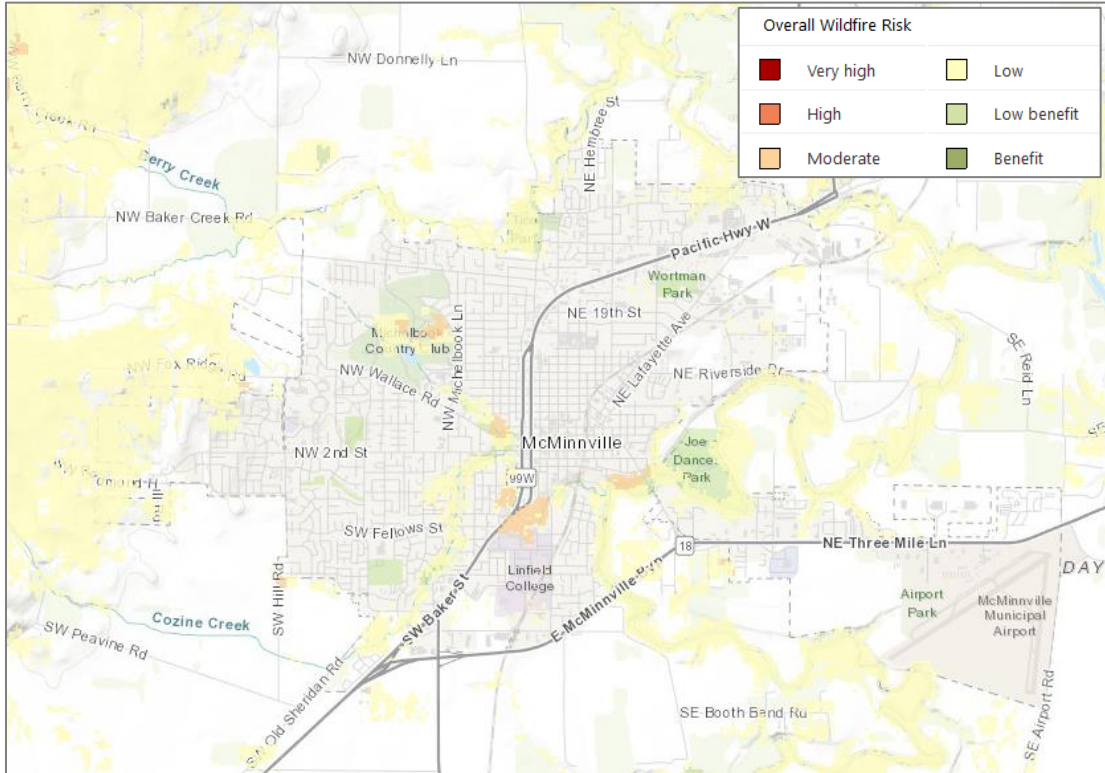
Wildfire

The steering committee determined that the City's probability for wildfire is **moderate** and that their vulnerability to wildfire is **moderate**.

The [Yamhill County Community Wildfire Protection Plan \(CWPP\)](#) was completed in August 2009 and revised in 2015. The CWPP is hereby incorporated into this NHMP addendum by reference, and it will serve as the wildfire section for this addendum.

Volume I, Section 2 describes the characteristics of wildland fire hazards, history, as well as the location, extent, and probability of a potential event within the region. The location, and extent of a wildland fire vary depending on fuel, topography, and weather conditions. Weather, and urbanization conditions are primarily at cause for the hazard level. McMinnville has not experienced a wildfire within City limits. The city is surrounded by developed land, rivers, and/or irrigated agricultural land. However, some wooded areas are a concern in the case of a wildfire event, particularly in the western part of the city. Figure MA-8 shows overall wildfire risk in McMinnville.

Figure MA-8 Overall Wildfire Risk



Source: [Oregon Wildfire Risk Explorer](#), date accessed April 27, 2020.

There have been several small wildfires in and surrounding the city since 1992. One 13-acre human caused wildfire occurred in the northeastern section of the city in 2015, in 2017 a wheat field caught fire near the Grandhaven Development, and in 2019 a 40-acre human caused fire occurred off Baker Creek Rd in the western part of the city. Additional, small wildfire have occurred (usually human caused) adjacent to the city and within the watershed.

The forested areas within, and surrounding McMinnville are interface areas. These areas are characterized by varying housing structures (often large houses on small lots, some with shake roofs), natural, and ornamental vegetation, and topography that may increase the risk for wildfire spreading (particularly to the north and northeast).

Most of the city has less severe (low) wildfire burn probability that includes expected flame lengths less than four feet under normal weather conditions.¹⁴ However, conditions vary widely and with local topography, fuels, and local weather (including wind) conditions. Under warm, dry, windy, and drought conditions expect higher likelihood of fire starts, higher intensity, more ember activity, and a more difficult to control wildfire that will include more fire effects and impacts. The potential community impacts, and vulnerabilities described in Volume I, Section 2 are generally accurate for the City as well. McMinnville’s fire response is provided by the McMinnville Fire Department. The CWPP assesses wildfire risk, maps wildland urban interface areas, and includes actions to mitigate wildfire risk (all

¹⁴ [Oregon Wildfire Risk Explorer](#),

identified actions are outside the city limits). However, several identified projects are located within, or near, the city's watershed including moderate priority hazard fuel reduction projects in the Baker Creek Area and Fox Ridge Area, and a high priority defensible space project Eagle Point Way. The City will update the City's wildfire risk assessment if the CWPP presents better data during future updates (an action item is included to participate in future updates to the CWPP).

Vulnerability Assessment

Due to insufficient data and resources, McMinnville is currently unable to perform a quantitative risk assessment for this hazard. The city's biggest wildfire vulnerability is in the west area of the city and adjoining lands and within the city's 6,350-acre watershed, owned McMinnville Water and Light (MW&L), located about 9 miles west of the city in the Coast Mountain Range. Overall, the watershed has low to moderate wildfire risk, however, the forested areas have the potential for large wildfires and a wildfire within the watershed could impact the city's water supply and quality.

Property can be damaged or destroyed with one fire as structures, vegetation, and other flammables easily merge to become unpredictable, and hard to manage. Other factors that affect ability to effectively respond to a wildfire include access to the location, and to water, response time from the fire station, availability of personnel, and equipment, and weather (e.g., heat, low humidity, high winds, and drought).

Exposed infrastructure including wastewater main lines, major water lines, natural gas pipeline and fiber optic lines are buried, decreasing their vulnerability to damage from wildfire hazards. However, wildfire conditions could potentially limit or delay access for the purposes of operation or repair.

The Oregon Wildfire Risk Explorer provides detail on the potential impact to structure from wildfire as shown in Figure MA-9, darker areas have higher potential impacts if fire ignites nearby. The areas of greater risk are generally located west of the city that are hillier and that are more heavily vegetated and forested.

Mitigation Activities

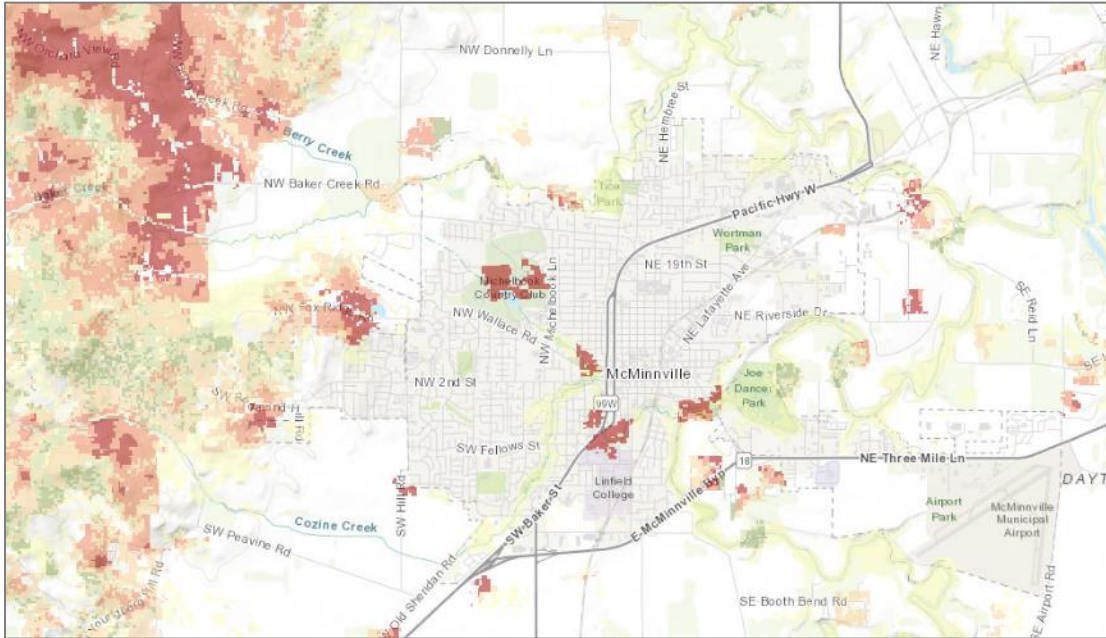
The McMinnville Fire Department works to mitigate problems regarding wildfire issues when they arise. Wildfire mitigation activities listed here include current mitigation programs and activities that are being implemented by McMinnville agencies or organizations. The Oregon Department of Forestry provides fire protection for the McMinnville Watershed.

City of McMinnville Codes Pertaining to Wildfires

The following McMinnville codes, plans, and policies pertain to wildfires:

1. McMinnville Comprehensive Plan (*under contract to update in 2020*). The updated plan includes a Natural Hazards Inventory and Management Program Recommendations including information on wildfire hazards impacting the city.
2. The City of McMinnville Municipal Code Title 13 provides standards for public infrastructure and utilities.
3. The City of McMinnville enforces the [Oregon Building Code](#) which regulates building material requirements and includes provisions for fires.

Figure MA-9 Overall Potential Impact



Source: [Oregon Wildfire Risk Explorer](#), date accessed April 27, 2020.

Please review the [Yamhill County Community Wildfire Protection Plan \(CWPP\)](#) and Volume I, Section 2 for additional information on this hazard.

ATTACHMENT A: ACTION ITEM FORMS

Table MA-1 provides a summary list of 2020 NHMP Actions for the city. Each high priority action item has a corresponding action item worksheet describing the activity, identifying the rationale for the project, identifying potential ideas for implementation, and assigning coordinating and partner organizations. The action item worksheets can assist the community in pre-packaging potential projects for grant funding. The worksheet components are described below.

ALIGNMENT WITH EXISTING PLANS/POLICIES

The City NHMP includes a range of action items that, when implemented, will reduce loss from hazard events in the City. Within the plan, FEMA requires the identification of existing programs that might be used to implement these action items. The City addresses statewide planning goals and legislative requirements through its comprehensive land use plan, capital improvements plan, mandated standards and building codes. To the extent possible, the City will work to incorporate the recommended mitigation action items into existing programs and procedures. Each action item identifies related existing plans and policies.

STATUS/RATIONALE FOR PROPOSED ACTION ITEM

Action items should be fact-based and tied directly to issues or needs identified throughout the planning process. Action items can be developed at any time during the planning process and can come from several sources, including participants in the planning process, noted deficiencies in local capability, or issues identified through the risk assessment. The rationale for proposed action items is based on the information documented in this addendum and within Volume I, Section 2. The worksheet provides information on the activities that have occurred since the previous plan for each action item.

IDEAS FOR IMPLEMENTATION

The ideas for implementation offer a transition from theory to practice and serve as a starting point for this plan. This component of the action item is dynamic, since some ideas may prove to not be feasible, and new ideas may be added during the plan maintenance process. Ideas for implementation include such things as collaboration with relevant organizations, grant programs, tax incentives, human resources, education and outreach, research, and physical manipulation of buildings and infrastructure.

COORDINATING (LEAD) ORGANIZATION:

The coordinating organization is the public agency with the regulatory responsibility to address natural hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring and evaluation.

INTERNAL AND EXTERNAL PARTNERS:

The internal and external partner organizations listed in the Action Item Worksheets are potential partners recommended by the project steering committee but not necessarily

contacted during the development of the plan. The coordinating organization should contact the identified partner organizations to see if they are capable of and interested in participation. This initial contact is also to gain a commitment of time and/or resources toward completion of the action items.

Internal partner organizations are departments within the City or other participating jurisdiction that may be able to assist in the implementation of action items by providing relevant resources to the coordinating organization.

External partner organizations can assist the coordinating organization in implementing the action items in various functions and may include local, regional, state, or federal agencies, as well as local and regional public and private sector organizations.

PLAN GOALS ADDRESSED:

The plan goals addressed by each action item are identified as a means for monitoring and evaluating how well the mitigation plan is achieving its goals, following implementation.

TIMELINE:

All broad scale action items have been determined to be ongoing, as opposed to short (0 to 2 years), medium (2-5 years), or long (6 or more years). This is because the action items are broad ideas, and although actions may be implemented to address the broad ideas, the efforts should be ongoing.

POTENTIAL FUNDING SOURCE

Where possible potential funding sources have been identified. Example funding sources may include: Federal Hazard Mitigation Assistance programs, state funding sources such as the Oregon Seismic Rehabilitation Grant Program, or local funding sources such as capital improvement or general funds. An action item may include several potential funding sources.

ESTIMATED COST

A rough estimate of the cost for implementing each action item is included. Costs are shown in general categories showing low, medium, or high cost. The estimated cost for each category is outlined below:

Low - Less than \$50,000

Medium - \$50,000 – \$100,000

High - More than \$100,000

Multi-Hazard #1

| | | | |
|---|---------------------------------|--|--|
| Proposed Action Item: | | Alignment with Plan Goals: | |
| Develop, enhance, and implement public education and information materials concerning mitigation, preparedness and safety procedures for identified natural hazards. | | Goal 1, Goal 2, Goal 3, Goal 6, Goal 8 | |
| Alignment with Existing Plans/Policies: | | | |
| Emergency Operations Plan | | | |
| 2020 Status/Rationale for Proposed Action Item: | | | |
| <p>The natural hazard sections of the City's addendum (Volume II) to the Yamhill Co. NHMP and Yamhill County's risk assessment (Volume I, Section 2 and Volume III, Appendix C) identify vulnerable populations and property within the various identified hazard areas. Increasing public outreach to educate residents about their risk to natural hazards affecting their community as well as what to do in the event of a natural hazard will help decrease their vulnerability to natural hazards.</p> <p>The Disaster Mitigation Act of 2000 requires communities to identify how the community will continue to involve the public in the plan maintenance process [201.6(c)(4)(iii)]. Educating landowners on how to mitigate the effects of natural hazards helps keep the public informed of what is being done with the plan, how the City is working to mitigate its risk to natural hazards, and allows for feedback and suggestions from the public for improving, updating, and maintaining the plan.</p> | | | |
| Ideas for Implementation: | | | |
| <p>Distribution of natural hazard information describing dangers and evacuation routes for visitors to McMinnville and continued educational outreach for residents and business owners.</p> <p>Update brochures with new information provided as part of reports provided by DOGAMI, ODF, DLCD, and FEMA (among others).</p> <p>Identify and use existing mechanisms for public outreach (e.g., SWCD, NRCS, watershed councils, OSU Extension, etc.).</p> | | | |
| Coordinating Organization: | | Emergency management, MW&L | |
| Internal Partners: | | External Partners: | |
| Planning, Public Works, Fire, Police | | OEM, DLCD, FEMA, DOGAMI | |
| Potential Funding Sources: | | Estimated cost: | Timeline: |
| General fund, grants | | Low | <input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing |
| Form Submitted by: | 2019-20 NHMP Steering Committee | | |
| Priority: | High | | |

Multi-Hazard #2

| | | | |
|--|---------------------------------|--|--|
| Proposed Action Item: | | Alignment with Plan Goals: | |
| Incorporate mitigation planning provisions into community planning processes such as comprehensive, capital improvement, land use, transportation plans, zoning ordinances, community development practices, etc. | | Goal 1, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8 | |
| Alignment with Existing Plans/Policies: | | | |
| Comprehensive Plan, Development Code, Master Plans (Water/Wastewater), Transportation System Plan | | | |
| 2020 Status/Rationale for Proposed Action Item: | | | |
| <p>Comprehensive plans provide the framework for the physical design of a community. They shape overall growth and development while addressing economic, environmental and social issues. Oregon’s statewide goals are accomplished through local comprehensive plans. State Law requires local governments to adopt a comprehensive plan and the zoning and land-division ordinances needed to put the plan into action.</p> <p>Integration of NHMPs into comprehensive plans and other plans will help to reduce a community’s vulnerability to natural hazards, support in mitigation activities, help to increase the speed in which action items are implemented and therefore the speed in which communities recover from natural disasters.</p> <p>Integration of NHMPs into local plans gives the action items identified in the NHMP legal status for guiding local decision-making regarding land use and/ or capital expenditures. .</p> | | | |
| Ideas for Implementation: | | | |
| <p>Conduct a policy crosswalk of the NHMP, the comprehensive plan, and other planning documents, to identify areas of possible integration.</p> <p>Integrate natural hazards information and policies into the comprehensive plan and other plans.</p> <p>Engage in collaborative planning and integration.</p> <p>Coordinate future NHMP and comprehensive plan reviews and updates.</p> | | | |
| Coordinating Organization: | | Planning | |
| Internal Partners: | | External Partners: | |
| Engineering, MW&L | | DOGAMI, DLCD, OEM | |
| Potential Funding Sources: | | Estimated cost: | Timeline: |
| General fund, DLCD technical assistance grant | | Low | <input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing |
| Form Submitted by: | 2019-20 NHMP Steering Committee | | |
| Priority: | High | | |

Multi-Hazard #6

| | | | |
|--|---------------------------------|---|--|
| Proposed Action Item: | | Alignment with Plan Goals: | |
| Develop and maintain GIS mapped critical facility inventory. | | Goal 1, Goal 2, Goal 3, Goal 4, Goal 6, Goal 8 | |
| Alignment with Existing Plans/Policies: | | | |
| 2020 Status/Rationale for Proposed Action Item: | | | |
| <p>McMinnville’s addendum and Yamhill County’s risk assessment identify limited properties located in hazards areas. Improving technology, particularly GIS and communications, for the identification of vulnerable facilities will help decrease their vulnerability to natural hazards.</p> <p>The Disaster Mitigation Act of 2000 requires communities to identify how the community will continue to involve the public in the plan maintenance process [201.6(c)(4)(iii)]. Improving technology capacity will allow more widespread dissemination of information, thus assisting in keeping residents informed of what is being done with the plan, how the City is working to mitigate its risk to natural hazards and allowing for feedback and suggestions from the public for improving, updating, and maintaining the plan.</p> | | | |
| Ideas for Implementation: | | | |
| <p>Identify and map critical facilities and identify the location and extent of hazard areas and establish a factual base to support implementation of future mitigation measures; and</p> <p>Analyze the risk of these areas to property, and infrastructure.</p> | | | |
| Coordinating Organization: | | Engineering, MW&L | |
| Internal Partners: | | External Partners: | |
| Planning, Fire, Police | | DOGAMI, DLCD, ODF, other state and federal agencies | |
| Potential Funding Sources: | | Estimated cost: | Timeline: |
| General fund, grants | | Low | <input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing |
| Form Submitted by: | 2019-20 NHMP Steering Committee | | |
| Priority: | High | | |

Multi-Hazard #7

| | | | |
|---|--|--|--|
| Proposed Action Item: | | Alignment with Plan Goals: | |
| Develop and maintain GIS mapped hazard areas within the UGB. | | Goal 1, Goal 2, Goal 3, Goal 4, Goal 6, Goal 8 | |
| Alignment with Existing Plans/Policies: | | | |
| Comprehensive Plan | | | |
| 2020 Status/Rationale for Proposed Action Item: | | | |
| <p>The Risk Assessment section of the McMinnville NHMP addendum identifies the potential hazard risk areas within the city.</p> <p>The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on both new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Identifying and mapping existing areas with exposure to profiled natural hazard risk will allow for better understanding of the areas at risk and for the implementation of mitigation measures to reduce this risk.</p> | | | |
| Ideas for Implementation: | | | |
| <p>Collect existing available GIS data for profiled natural hazards from state and federal partners. Data is available for geohazards on the DOGAMI website publications search: https://www.oregongeology.org/pubs/pubsearch.htm</p> | | | |
| Coordinating Organization: | | Engineering, MW&L | |
| Internal Partners: | | External Partners: | |
| Planning, Fire, Police | | DOGAMI, USGS, FEMA, DLCD, ODF | |
| Potential Funding Sources: | | Estimated cost: | Timeline: |
| General fund, grants | | Low | <input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing |
| Form Submitted by: | | 2019-20 NHMP Steering Committee | |
| Priority: | | High | |

Multi-Hazard #8

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|--|---------------------------------|--|--|
| Proposed Action Item: | | Alignment with Plan Goals: | |
| Develop & construct multi-jurisdictional fuel station and mobile fuel capabilities. | | Goal 1, Goal 2, Goal 3, Goal 4, Goal 6, Goal 8 | |
| Alignment with Existing Plans/Policies: | | | |
| | | | |
| 2020 Status/Rationale for Proposed Action Item: | | | |
| A multi-jurisdictional fueling station coupled with mobile fueling capacity will provide more reliable and redundant fuel supply to participating partners during emergency response operations. | | | |
| Ideas for Implementation: | | | |
| McMinnville Water & Light is advancing plans to construct a fueling station during fiscal year 2021 and is working with the City regarding its ability to participate. | | | |
| Coordinating Organization: | | Engineering, MW&L | |
| Internal Partners: | | External Partners: | |
| Planning, Fire, Police | | ODOT, Yamhill Co, other cities in Yamhill County | |
| Potential Funding Sources: | | Estimated cost: | Timeline: |
| General fund, MW&L | | High | <input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing |
| Form Submitted by: | 2019-20 NHMP Steering Committee | | |
| Priority: | High | | |

Multi-Hazard #1 I

| | | | |
|---|---------------------------------|--|--|
| Proposed Action Item: | | Alignment with Plan Goals: | |
| Limit (e.g. reduced density, etc.) or prohibit development in high hazard areas. | | Goal 2, Goal 3, Goal 4, Goal 6, Goal 7, Goal 8 | |
| Alignment with Existing Plans/Policies: | | | |
| Comprehensive Plan, Development Code, Strategic Plan | | | |
| 2020 Status/Rationale for Proposed Action Item: | | | |
| The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on both new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Limiting and prohibiting development in high hazards zones will reduce risk to people and property. | | | |
| Ideas for Implementation: | | | |
| Complete, adopt and implement the “McMinnville Area Natural Hazards Inventory and Management Program Recommendations” plan, which will include an inventory of natural hazards based on available mapping sources; consider alternative management options; and suggest policy and mapping amendments to the McMinnville Comprehensive Plan to systematically address McMinnville’s mappable natural hazards. | | | |
| Coordinating Organization: | | Planning | |
| Internal Partners: | | External Partners: | |
| Engineering | | DLCD | |
| Potential Funding Sources: | | Estimated cost: | Timeline: |
| General fund | | Low | <input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing |
| Form Submitted by: | 2019-20 NHMP Steering Committee | | |
| Priority: | High | | |

Multi-Hazard #12

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|---|---------------------------------|--|--|
| Proposed Action Item: | | Alignment with Plan Goals: | |
| Encourage mitigation practices in developments at risk to natural hazards. | | Goal 1, Goal 2, Goal 3, Goal 4, Goal 6, Goal 8 | |
| Alignment with Existing Plans/Policies: | | | |
| Comprehensive Plan, Development Code, Strategic Plan | | | |
| 2020 Status/Rationale for Proposed Action Item: | | | |
| The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on both new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Encouraging the use of mitigation techniques to limit risk to natural hazards will reduce risk to people and property. | | | |
| Ideas for Implementation: | | | |
| Complete, adopt and implement the “McMinnville Area Natural Hazards Inventory and Management Program Recommendations” plan, which will include an inventory of natural hazards based on available mapping sources; consider alternative management options; and suggest policy and mapping amendments to the McMinnville Comprehensive Plan to systematically address McMinnville’s mappable natural hazards. | | | |
| Coordinating Organization: | | Planning | |
| Internal Partners: | | External Partners: | |
| Engineering | | DLCD | |
| Potential Funding Sources: | | Estimated cost: | Timeline: |
| General fund | | Low | <input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing |
| Form Submitted by: | 2019-20 NHMP Steering Committee | | |
| Priority: | High | | |

Earthquake #1

| | | | |
|---|---------------------------------|--|--|
| Proposed Action Item: | | Alignment with Plan Goals: | |
| Complete inventory and seismic assessment of critical facilities. | | Goal 2, Goal 3, Goal 4, Goal 6, Goal 7, Goal 8 | |
| Alignment with Existing Plans/Policies: | | | |
| | | | |
| 2020 Status/Rationale for Proposed Action Item: | | | |
| <p>Currently, all new facilities must comply with and meet seismic standards. If someone moves into an old building, they must upgrade to current standards.</p> <p>DOGAMI did a windshield survey of schools, fire stations, police, and city halls (2007 RVS). The focus was on action of existing buildings and information was shared with participants.</p> <p>Seismic resiliency is a component of MW&L's collection system and the city's wastewater treatment facility master plans. Upgrades are constructed as opportunity and funding allow.</p> | | | |
| Ideas for Implementation: | | | |
| <p>Provide information to government building and school facility managers and teachers on nonstructural mitigation techniques including: securing bookcases, filing cabinets, light fixtures, and other objects that can cause injuries and block exits;</p> <p>Encourage facility managers, business owners, and teachers to refer to FEMA's practical guidebook: Reducing the Risks of Nonstructural Earthquake Damage;</p> <p>Encourage homeowners and renters to use Is Your Home Protected from Earthquake Disaster? A Homeowner's Guide to Earthquake Retrofit (IBHS) for economic and efficient mitigation techniques;</p> <p>Use the FEMA 154 seismic evaluations generated by DOGAMI to prioritize critical and essential buildings for upgrades;</p> <p>Explore partnerships to provide retrofitting classes for homeowners, renters, building professionals, and contractors; and</p> <p>Target development located in potential fault zones or in unstable soils for intensive education and retrofitting resources.</p> | | | |
| Coordinating Organization: | | Engineering, MW&L | |
| Internal Partners: | | External Partners: | |
| Fire, Planning | | School district | |
| Potential Funding Sources: | | Estimated cost: | Timeline: |
| General fund, utility fees, HMA grants | | High | <input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing |
| Form Submitted by: | 2019-20 NHMP Steering Committee | | |
| Priority: | High | | |

Landslide #2

| | | | |
|---|---------------------------------|--|--|
| Proposed Action Item: | | Alignment with Plan Goals: | |
| Develop a process to limit future development in high landslide potential areas - permitting, geotechnical review, soil stabilization techniques, etc. | | Goal 2, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8 | |
| Alignment with Existing Plans/Policies: | | | |
| Comprehensive Plan, Development Code, Strategic Plan | | | |
| 2020 Status/Rationale for Proposed Action Item: | | | |
| The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on both new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Identifying existing landslide hazard areas will allow for a better understanding of the area at risk and the implementation of mitigation measures to reduce this risk. | | | |
| Ideas for Implementation: | | | |
| Complete, adopt and implement the “McMinnville Area Natural Hazards Inventory and Management Program Recommendations” plan, which will include an inventory of natural hazards based on available mapping sources; consider alternative management options; and suggest policy and mapping amendments to the McMinnville Comprehensive Plan to systematically address McMinnville’s mappable natural hazards. | | | |
| Incorporate relevant aspects of the DLCD Landslide Land Use Guide (“ Preparing for Landslide Hazards, A Land Use Guide for Oregon Communities ”) | | | |
| Coordinating Organization: | | Planning | |
| Internal Partners: | | External Partners: | |
| Engineering, McMinnville Water & Light | | DLCD, DOGAMI | |
| Potential Funding Sources: | | Estimated cost: | Timeline: |
| General fund, Utility Fees, grants | | Medium | <input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing |
| Form Submitted by: | 2019-20 NHMP Steering Committee | | |
| Priority: | High | | |

Wildfire #1

| | | | |
|---|---------------------------------|--|--|
| Proposed Action Item: | | Alignment with Plan Goals: | |
| Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan. | | Goal 1, Goal 2, Goal 3, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8 | |
| Alignment with Existing Plans/Policies: | | | |
| Yamhill County CWPP | | | |
| 2020 Status/Rationale for Proposed Action Item: | | | |
| The wildfire mitigation action items provide direction on specific activities that organizations and residents in McMinnville/Yamhill County can take to reduce wildfire hazards. | | | |
| Ideas for Implementation: | | | |
| Implement high and medium priority projects including defensible space and fuels reduction projects identified in the CWPP. | | | |
| Coordinating Organization: | | Fire | |
| Internal Partners: | | External Partners: | |
| Planning, Emergency Management, MW&L | | ODF, USFS, Fire Defense Board | |
| Potential Funding Sources: | | Estimated cost: | Timeline: |
| General fund, ODF grants | | Medium to High | <input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing |
| Form Submitted by: | 2019-20 NHMP Steering Committee | | |
| Priority: | High | | |

Wildfire #2

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|--|---------------------------------|--|--|
| Proposed Action Item: | | Alignment with Plan Goals: | |
| Provide wildland fire information in an easily distributed format for all residents. | | Goal 1, Goal 2, Goal 3, Goal 6, Goal 8 | |
| Alignment with Existing Plans/Policies: | | | |
| | | | |
| 2020 Status/Rationale for Proposed Action Item: | | | |
| <p>The natural hazard sections of the City's addendum (Volume II) to the Yamhill Co. NHMP and Yamhill County's risk assessment (Volume I, Section 2 and Volume III, Appendix C) identify vulnerable populations and property within the wildfire hazard area. Increasing public outreach to educate residents about their risk to natural hazards affecting their community as well as what to do in the event of a natural hazard will help decrease their vulnerability to natural hazards.</p> <p>The Disaster Mitigation Act of 2000 requires communities to identify how the community will continue to involve the public in the plan maintenance process [201.6(c)(4)(iii)]. Educating landowners on how to mitigate the effects of natural hazards helps keep the public informed of what is being done with the plan, how the City is working to mitigate its risk to natural hazards, and allows for feedback and suggestions from the public for improving, updating, and maintaining the plan.</p> | | | |
| Ideas for Implementation: | | | |
| <p>Distribution of wildfire hazard information describing dangers and evacuation routes for visitors to McMinnville and continued educational outreach for residents and business owners.</p> <p>Update brochures with new information provided as part of reports provided by Firewise, ODF, DOGAMI, DLCD, and FEMA (among others).</p> <p>Identify and use existing mechanisms for public outreach (e.g., SWCD, NRCS, watershed councils, OSU Extension, etc.).</p> | | | |
| Coordinating Organization: | | Fire | |
| Internal Partners: | | External Partners: | |
| Planning, Emergency Management, MW&L | | ODF, USFS, Fire Defense Board | |
| Potential Funding Sources: | | Estimated cost: | Timeline: |
| General fund, utility fees | | Low | <input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing |
| Form Submitted by: | 2019-20 NHMP Steering Committee | | |
| Priority: | High | | |

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ATTACHMENT B: PUBLIC INVOLVEMENT SUMMARY

Members of the steering committee provided edits and updates to the NHMP prior to the public review period as reflected in the final document.

To provide the public information regarding the draft NHMP addendum, and provide an opportunity for comment, an announcement (see text below) was placed on the city's website and an email contact was provided for public comment. The press release was also provided to the local newspaper (News Register) and was posted on the city's social media pages (Facebook, Instagram).

During the public review period there were no comments provided.

The screenshot shows the City of McMinnville website. The header includes the city name and navigation links: Home, Contact Us, Code Compliance & Community Relations, and a language selector. A red navigation bar contains links for GOVERNMENT, BUSINESS, COMMUNITY, and I WANT TO, along with a search bar. The main content area features a large green heading: "Press Release for McMinnville addendum to the Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan Update – Notice and Opportunity for Public Comment". Below this is a "Supporting Documents" section with two links: "Press Release - McMinnville seeks additional public input on update to Natural Hazard Mitigation Plan (41 KB)" and "City of McMinnville Addendum to the Yamhill County Multi-Jurisdictional Hazard Mitigation Plan - DRAFT (10 MB)". On the right side, there is a "Community" section with a "Get Involved!" button and a "Contact Information" box listing Noelle Amaya, Community Engagement & Public Affairs, with contact details: 231 NE 5th Street, McMinnville, OR 97128, 503-435-0402, and a link to "View Full Contact Details".



PRESS RELEASE

DATE: June 29, 2020

SUBJECT: Press Release for McMinnville addendum to the Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan Update – Notice and Opportunity for Public Comment

For Immediate Release

McMinnville seeks additional public input on update to Natural Hazard Mitigation Plan

(McMinnville, OR) – McMinnville is in the process of updating their existing Natural Hazard Mitigation Plan (NHMP). This work is being performed in cooperation with the University of Oregon’s Institute for Policy Research and Engagement - Oregon Partnership for Disaster Resilience and the Oregon Military Department’s Office of Emergency Management utilizing funds obtained from the Federal Emergency Management Agency’s (FEMA) Pre-Disaster Mitigation Grant Program. With re-adoption of the plan, McMinnville will regain its eligibility to apply for federal funding towards natural hazard mitigation projects. This local planning process includes a wide range of representatives from city and county government, emergency management personnel, and outreach to members of the public in the form of an electronic survey.

A natural hazard mitigation plan provides communities with a set of goals, action items, and resources designed to reduce risk from future natural disaster events. Engaging in mitigation activities provides jurisdictions with a number of benefits, including reduced loss of life, property, essential services, critical facilities, and economic hardship; reduced short-term and long-term recovery and reconstruction costs; increased cooperation and communication within the community through the planning process; and increased potential for state and federal funding for recovery and reconstruction projects.

An electronic version of the updated draft McMinnville NHMP addendum will be available for formal public comment beginning June 29, 2020. To view the draft please visit the “Latest News” section of the City’s website: <https://www.mcminnvilleoregon.gov/>

If you have any questions regarding the McMinnville NHMP addendum or the update process in general, please contact: Mike Bisset, Community Development Director at (503) 434-7312 or mike.bisset@mcminnvilleoregon.gov; or Michael Howard, Assistant Program Director for the Oregon Partnership for Disaster Resilience at mrhoward@uoregon.edu.

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