



# HAZARD MITIGATION PLAN 2020

**DOUGLAS COUNTY, WA**



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Two Rivers Emergency Management, LLC is pleased to submit this Multi-Jurisdictional Hazard Mitigation Plan (the "Deliverable") to Douglas County, Washington (the "Client"). The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of other organizations. This Deliverable was developed with input from, and in collaboration with, the Client. It is subject to the terms of the contract dated May 22, 2017 between Two Rivers Emergency Management, LLC and the Client, and constitutes the entire agreement between them. The Contract includes any and all representations, warranties, indemnifications, and remedies on which the Client may rely. Because of the specialized knowledge of the Client about how this Deliverable is to be used, it should be used only by the Client and its affiliates, in a manner that relies on the Client's discretion and expertise, and only for the purposes contemplated by the Contract. This Deliverable is not to be used in any other manner or relied upon by any other person.

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# Glossary

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CDBG – Community Development Block Grant Program  
CRS – Community Rating System  
DC – Douglas County  
DEM – Department of Emergency Management  
EOC – Emergency Operations Center  
FCCD – Foster Creek Conservation District  
FEMA – Federal Emergency Management Agency  
FIRM – Flood Insurance Rate Map  
FMA – Flood Mitigation Assistance Grant Program  
HMA – Hazard Mitigation Assistance  
HMGP – Hazard Mitigation Grant Program  
HMP – Hazard Mitigation Plan  
NFHL – National Flood Hazard Layer  
NFIP – National Floodplain Insurance Program  
NOAA – National Oceanic and Atmospheric Administration  
NWS – National Weather Service  
PDM – Pre-Disaster Mitigation Grant Program  
PUD – Public Utility District  
SFHA – Special Flood Hazard Area  
TREM – Two Rivers Emergency Management  
USACE – United States Army Corps of Engineers  
USCB – United State Census Bureau  
USDA – United States Department of Agriculture  
WA EMD – Washington Emergency Management Division  
WUI – Wildland Urban Interface

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# Section 1 – Plan Development

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## *Plan Purpose*

The 2020 Douglas County Multi-Jurisdictional Hazard Mitigation Plan (HMP) revision is threefold in its purpose. Strictly speaking, the Douglas County Multi-Jurisdictional Hazard Mitigation Plan provides guidance to substantially and permanently reduce Douglas County and its communities' vulnerability to natural hazards.



This plan revision encompasses the continuation and updating of this original mission by incorporating new GIS technologies, improving its risk assessment methodologies, and recalibrating its mitigation strategies based on an assessment of the previous plan, approved in 2010, and the previous plan's usefulness since its development.

Secondly, participation in and the adoption of this plan grants the adopting entity the ability to apply for multiple grant funding programs through the Federal Emergency Management Agency (FEMA).

Additionally, a tertiary purpose of the plan is to promote sound public policy and support other local, regional, and state planning efforts which have the effects of protecting citizens, critical facilities, infrastructure, private property, and the natural environment. The development of this plan revision does so by increasing public awareness and education, collaborating with other planning organizations and governments engaged in planning efforts, serving as a reference and resource for the public, various governments, and other entities.

## *Plan Organization*

The Douglas County Multi-Jurisdictional Hazard Mitigation Plan was developed and organized within the rules and regulations established under the 44 Code of Federal Regulation 201.6. This plan contains sections detailing the planning process, Douglas County's communities, other participating entities and the planning area, a hazard vulnerability and risk assessment, capabilities assessment, and a mitigation strategy designed for the purpose of guiding Douglas County and the plan's participants to become more disaster-resilient communities.

## *Plan Financing*

The Douglas County Multi-Jurisdictional Hazard Mitigation Plan has been financed by the Douglas County Board of Commissioners and a FEMA Hazard Mitigation Grant Program (HMGP) Grant administered through the State of Washington's Emergency Management Division (WA EMD). The federal grant provided 75% of the total plan's cost while Douglas County contributes 12.5% and WA EMD provides 12.5%.

### ***Plan Participation***

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The Douglas County Multi-Jurisdictional Hazard Mitigation Plan was developed as the result of an ongoing collaborative effort between the full range of stakeholders in the planning area, local authorities, school districts, municipal jurisdictions, fire districts, utility districts, conservation districts, and the State of Washington. This effort was led by the Douglas County Department of Emergency Management (DC DEM) under. All municipal governments within the borders of Douglas County fall under the emergency management jurisdiction of the DC DEM.

Concerns, capabilities, interests and historical data were gathered through interviews with stakeholders from within the communities, along with a number of electronic datasets, and ongoing planning committee work sessions. The public were granted opportunities to provide their input, influence, share knowledge, and be active participants in the plan’s development. This was accomplished through a number of public outreach campaigns in the form of on-site meetings and internet accessible surveys. Any comments, questions, and discussions resulting from these activities were given consideration in the development of this plan.

### ***Approval & Adoption***

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The Douglas County Multi-Jurisdictional Hazard Mitigation Plan was submitted for review to WA EMD on November 30, 2019. Following the state’s review, the plan was submitted to the FEMA Region X office for federal review. FEMA Region X granted “Approval Pending Adoption” status on March 25, 2020.

This plan has officially been adopted by Douglas County, each participating municipality, the Foster Creek Conservation District, Douglas County Public Utility District, and the Eastmont School District.

## 1.1 – Planning Process

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Douglas County’s revision process began in March of 2017, when Douglas County was awarded an HMGP grant through the WA EMD under FM-5100-WA. Douglas County was awarded the grant to begin the process of updating their previously approved hazard mitigation plan. Following the funding commitment, Douglas County issued a request for proposals and selected Two Rivers Emergency Management (TREM) to facilitate the plan’s development under a performance contract.

Three planning events were held throughout the planning process. Plan development kicked-off on 24 July 2018. Two meetings were held during this on-site visit. Stakeholders from Douglas County and various county departments attended the meetings while members of the public attended as well. Stakeholders from every municipality, public-school district, and special purpose district in the county as well as and members of the public were invited to attend and participate. Municipal, school district, and special purpose district stakeholders that did not attend this meeting physically, chose to participate electronically. Additionally, neighboring DEM’s were invited, but none attended. The meetings were advertised for period of two weeks in advance and individual email invitations were sent out the plan’s participants.

These meetings and communications delivered an understanding of the planning processes and steps required to update, including the organizing of resources, assessment of hazards, development of a mitigation plan, and steps to implementing the plan and monitoring its progress. Most jurisdictions in the county actively participated in the process through solicitation, providing input, or participation in meetings. Details and documentation of stakeholder participation can be found in Section 1.2 and Appendix A – Plan Participation.

Additionally, Douglas County, the Eastmont School District, the Foster Creek Conservation District, Douglas County Public Utility District, and the participating municipalities conducted internal outreach to relevant stakeholders inviting them to the kick-off meeting and notifying them of this plan’s development. They individually contacted planners, city managers, and any other relevant staff throughout the plan’s development when their expertise was required. In the event a situation arose wherein the county or municipal representative was called upon to collaborate with their staff, they used whichever internal planning process was most appropriate. In all cases, this took the shape of individual electronic or in-person collaborative meetings to gather information, provide other input, and review the draft plan.

Developing each section of this plan required input from every plan participant. This translated to TREM and Douglas County regularly communicating with the plan’s participants to gather information covering numerous areas from hazard impacts, community information, critical facilities, to past completed mitigation projects.

Throughout the plan’s development, Two Rivers Emergency Management kept a live website which it tracked the plan’s progress as well as posted drafts after completing each section. This plan’s

stakeholders had access to the website to review these drafts, ask questions, and provide input if they saw fit.

A draft review period was held for two weeks, 8 April 2019 to 22 April 2019, although no members of the public took this opportunity to view the draft. Each plan participant was contacted during this time period and provided the draft plan for review and acknowledgment of approval for submission.

Throughout the process the public was given opportunities to review plan drafts, ask questions, and provide input on hazards. They were also invited to provide feedback on mitigation project prioritization, hazard identification, and hazard ranking. This was accomplished through their inclusion

in the on-site meetings as well as an extensive online outreach campaign. Details and documentation of the public’s participation can be found in Section 1.3 and Appendix A – Plan Participation.

The 2020 Douglas County Multi-Jurisdictional Hazard Mitigation Plan encompasses the following 7 municipalities, 1 school district, 1 conservation district, 7 fire districts, and 1 public utility district:

*Douglas County*  
*Bridgeport*  
*Coulee Dam*  
*East Wenatchee*  
*Mansfield*  
*Rock Island*  
*Waterville*

*Eastmont School District*

*Foster Creek Conservation District*  
*Douglas County Fire District #1*  
*Douglas County Fire District #2*  
*Douglas County Fire District #3*  
*Douglas County Fire District #4*  
*Douglas County Fire District #5*  
*Douglas County Fire District #8*  
*Douglas-Okanogan County Rural Fire District #15*  
*Douglas County Public Utility District*

Although the fire districts were invited to participate in the plan’s development, their involvement was minimal. This plan aims to include them as much as possible, but does not purport their full participant status. Instead, the blueprint included in this plan aims to facilitate their inclusion in the next plan update or as jurisdictions that can individually join the plan ad hoc when their capabilities allow.

## 1.2 – Stakeholder Engagement

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The Douglas County Multi-Jurisdictional Hazard Mitigation Plan includes the governmental and education entities within Douglas County working together for the development and ongoing maintenance of this plan. The stakeholders are grouped into five categories.

### *Municipalities*

This group consists of representatives from municipal governments within the planning area.

### *Education Entities*

This group consists of representatives from the Eastmont School District. Other public-school districts in the county were contacted, but did not return correspondence.

### *Special Purpose Districts*

This group consists of local government like districts that are organized and funded to provide a specific function within the county. For this plan, this included a conservation district, fire districts, and public utility district.

### *Other Stakeholders*

This group consists of representatives from the local community, regulatory authorities, emergency services, commercial interests, neighboring DEMs, and other relevant organizations.

### *The Public*

FEMA requires this planning effort to be open to constant input from interested citizens in compliance with the Sunshine Laws. In Washington, public meetings must comply with the Washington Open Meetings Law, unless established by statutory exemption. Therefore, any individual citizens who wish to be involved in this effort to mitigate future disasters were encourage to attend the on-site meetings and complete the online mitigation survey to solicit relevant comments and concerns to be incorporated into the content of this plan.

Representatives from each group took part in periodic planning meetings, public meetings and events and individual meetings with TREM and DC DEM staff. Their specific involvement included activities such as collection and development of planning information, providing input into the planning process, reviewing draft editions of the plan and providing written documentation demonstrating their commitment to mitigation and intent to adopt the final approved plan. Although the four, neighboring county DEMs, Chelan, Grant, Kittitas, and Okanogan, were invited, none participated.

Each participating entity was expected to attend at least one of the on-site meetings, submit required data as requested, participate in the development of general information for the plan as well as their own individual planning information, mitigation strategies and initiatives, participate in a public review process, and submit the plan for formal adoption through their respective governing body. Information was kept on attendance, input and providing requested documentation. In the event an entity did not provide representation to a meeting, individual outreach was conducted to garner their inclusion.

The following table details the plan participants who participated in the hazard mitigation planning process. This list contains all relevant local and state agencies involved in hazard mitigation activities, agencies that have the authority to regulate development, and any appropriate neighboring communities.

**Table 1.1 – Stakeholders**

| Name           | Organization                                    | Position                                   |
|----------------|---|--|
| Kevin Morris   | Douglas County Sheriff's Department/DEM         | Sheriff/Emergency Manager                  |
| Jordyn Giulio  | Douglas County Risk Management                  | Risk Manager                               |
| Dan Sutton     | Douglas County Board of Commissioners           | District 1 Commissioner                    |
| Kyle Steinberg | Douglas County Board of Commissioners           | District 2 Commissioner                    |
| Steve Jenkins  | Douglas County Board of Commissioners           | District 3 Commissioner                    |
| Tiana Rowland  | Douglas County Board of Commissioners           | Clerk of the Board                         |
| Janet Conklin  | City of Bridgeport                              | Mayor                                      |
| Lori Barnett   | City of East Wenatchee                          | Community Development Director             |
| Randy Agnew    | City of Rock Island                             | Mayor                                      |
| Bob Poch       | Town of Coulee Dam                              | Mayor                                      |
| Tom Snell      | Town of Mansfield                               | Mayor                                      |
| Royal DeVaney  | Town of Waterville                              | Mayor                                      |
| Spencer Taylor | Eastmont School District                        | Executive Director of Elementary Education |
| Amanda Ward    | Foster Creek Conservation District              | District Manager                           |
| Dale Jordan    | Douglas County Fire District #1                 | Fire Chief                                 |
| Dave Baker     | Douglas County Fire District #2                 | Fire Chief                                 |
| Dale Rinker    | Douglas County Fire District #3                 | Fire Chief                                 |
| Jim Oatley     | Douglas County Fire District #4                 | Fire Chief                                 |
| Tyler Caille   | Douglas County Fire District #5                 | Fire Chief                                 |
| Don Rushton    | Douglas County Fire District #8                 | Fire Chief                                 |
| Dyer Hill      | Douglas-Okanogan County Rural Fire District #15 | Fire Chief                                 |
| Jeff Heminger  | Douglas County Public Utility District          | District Coordinator                       |

## 1.3 – Public Engagement

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The DC DEM provided the opportunity for neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process. The public was notified of open meetings via Douglas County’s website, their Facebook page, and two local newspapers, one of which is the official newspaper of record for the Douglas County government. Additionally, advertisements for the online public survey were put out on their website and Facebook page.

Relevant federal, state, local, and tribal governments, private, non-profit, regional organizations, and agencies with the authority to regulate development were invited to provide input and technical expertise through the public notices. They were contacted directly when their expertise was deemed necessary to the success of the plan.

At the public on-site meetings, TREM presented and outlined the mitigation plan update process to the public. During the first stakeholder meeting, TREM presented and outlined the mitigation plan update process and discussed stakeholder participation and expectations. In both meetings, the public and other stakeholders were encouraged to ask questions and provide their input. The final draft of this plan was available for public review at the Douglas County administration building. Any and all questions asked were answered.

### *Continued Public Involvement*

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Douglas County is dedicated to involving the public in the continual shaping of its hazard mitigation plan and development of its mitigation projects and activities.

The DC DEM will continue to keep the public informed about its hazard mitigation projects and activities through its website. Additionally, it will provide a “comments/suggestions” option for the public to submit their input through their website.

The public has always and will continue to be invited to attend and participate in Douglas County’s Board of Commissioners meetings.

Copies of the Douglas County Multi-Jurisdictional Hazard Mitigation Plan will be available in county offices for viewing.

## 1.4 – Planning Resources

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This plan’s content includes and was influenced by numerous documents and technical resources provided by the plan’s stakeholders and other relevant entities. The following documents and technical resources were reviewed for applicable information to the development of this plan:

### *Documentation Resources*

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#### *District Strategic Improvement Plan (2018-2023)*

The latest approved update to this plan was reviewed for demographic and community projection information and the general strategic vision for the Eastmont School District.

#### *Douglas County and City Municipal Codes*

Each municipality’s local ordinances have been reviewed for provisions relevant to hazard mitigation. This information has been incorporated throughout Section 4 of this plan.

#### *Douglas County Comprehensive Plan (2017)*

Douglas County’s latest comprehensive plan laid part of the groundwork for this plan’s mitigation strategy. It did so by providing insight into planning and development direction of the planning area and its local governments.

#### *Douglas County Hazard Mitigation Plan (2010)*

Douglas County’s last hazard mitigation plan was approved in 2010 and since expired. The plan was thoroughly reviewed and components have been updated and incorporated throughout.

#### *Inventory of Dams Report (2018)*

The State of Washington Department of Ecology published its latest Inventory of Dams Report in 2018. This document was used in fine tuning the hazard categories further than the USACE’s classifications and matching this plan’s location, extent, impact, and vulnerability assessments and estimates to matching this document’s assessments and estimates.

#### *Washington State Enhanced Hazard Mitigation Plan (2018)*

The State of Washington’s current hazard mitigation plan was reviewed for general guidance in the cases of their comparative statewide risk assessment, their initial selection of at-risk hazards, and local planning technical assistance and development strategy.

## ***Technical Resources***

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### ***ESRI ArcGIS v10***

The principal software used to analyze geographic data and produce maps.

### ***National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC)***

Weather data and historical events were primary provided by NOAA's NCDC.

### ***USACE National Inventory of Dams (NID)***

The USACE NID is a congressionally authorized database which documents dams in the U.S. and its territories. This database attempts to maintain centralized data for all private and public dams. Information from the NID was used in the development of the Dam Failures hazard profile in this plan.

### ***United States Census Bureau (USCB)***

The USCB publicly publishes a number of GIS datasets that were used in developing the basemap layers used throughout this plan.

### ***United States Department of Agricultural (USDA) Statistics Service***

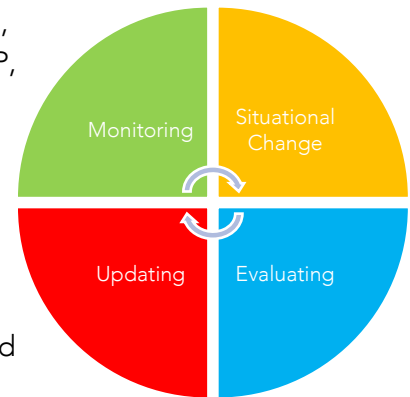
The USDA provided GIS data that was used in depicting land cover and the agricultural statistics used in developing the planning area's risk to droughts and grass and wildland fires.

### ***University of Wisconsin – Madison, SILVIS Lab***

Silvis Lab maintains GIS databases of vegetation cover layered with population density. These GIS datasets then form the composite Wildland Urban Interface (WUI).

## 1.5 – Plan Maintenance

The DC DEM has developed a method to ensure monitoring, evaluation, and updating of its HMP. Upon adoption of the Douglas County MJHMP, the DC DEM will form a committee on mitigation projects comprised of volunteer members from this plan’s participants. The chair of the committee will be determined by appointment from the DC DEM Director. Additional members may be added based on necessity. The committee will submit an annual report to the DC DEM.



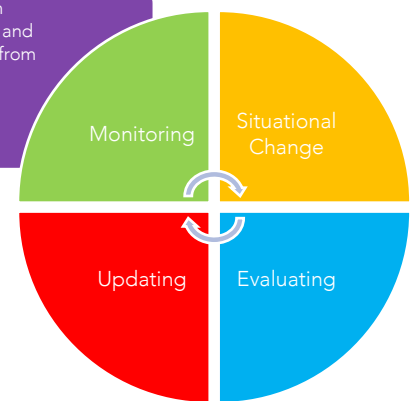
Please see the Douglas County MJHMP Quarterly Report form at the end of this section.

DC DEM may request a non-scheduled report on the monitoring, evaluation, or updating of any portion of the MJHMP due to irregular progress on mitigation actions and or projects, in the aftermath of a hazard event, or for any reason deemed appropriate.

### *Plan Monitoring*

Plan monitoring can be defined as the ongoing process by which stakeholders obtain regular feedback on the progress being made towards achieving their goals and objectives. In the more limited approach, monitoring may focus on tracking projects and the use of the agency’s resources. In the broader approach, monitoring also involves tracking strategies and actions being taken by partners and non-partners, and figuring out what new strategies and actions need to be taken to ensure progress towards the most important results.

• Regularly report on mitigation actions' and projects' progress from start to finish.



A monitoring report will be written and submitted to the DC DEM annually or when triggered by a situation change. The monitoring report will answer the following questions:

- Is the mitigation project under, over, or on budget?
- Is the mitigation project behind, ahead of, or on schedule?
- Are there any changes in Douglas County’s capabilities which impact the MJHMP?
- Are there any changes in Douglas County’s hazard risk?
- Has the mitigation action been initiated or its initiation planned?
- If applicable, has participation in a mitigation action’s collaboration been regular?
- If any, what plan updates occurred, why they occurred, and what is their impact?

The plan maintenance process is cyclical and maintenance items can operate simultaneously within the process.

## Plan Evaluating

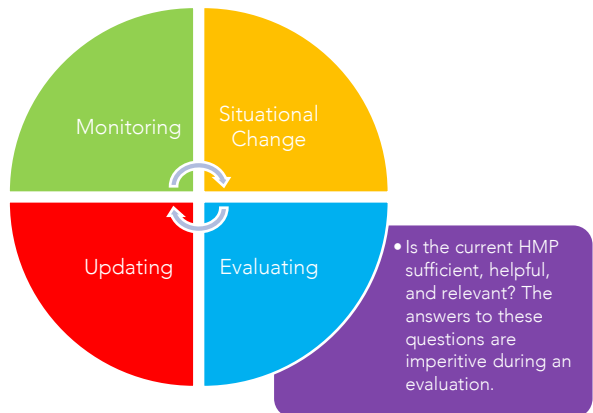
A plan evaluation is a rigorous and independent assessment of either completed or ongoing activities to determine the extent to which they are achieving stated objectives and contributing to decision making.

An evaluation report will be written and submitted to the DC DEM when the situation dictates. The following situations are typical examples of when an evaluation will be necessary:

- Post hazard event
- Post training exercise
- Post tabletop or drill exercise
- Significant change or completion of a mitigation project
- Significant change or completion of a mitigation action

An evaluation report will ask the following questions in response to the previously listed events:

- Do the mitigation objectives and goals continue to address the current hazards?
- Are there new or previously unforeseen hazards?
- Are current resources appropriate for implementing a mitigation project?
- Was the outcome of a mitigation action/project expected?
- Are there implementation problems?
- Are there coordination problems?

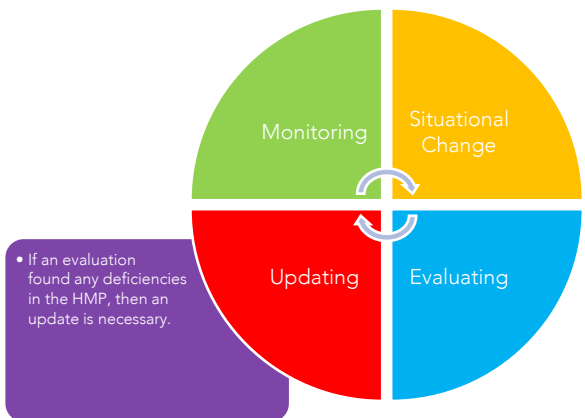


## Plan Updating

Typically, a MJHMP update is initiated upon the completion of a plan evaluation and even then, only when the evaluation determines an update is appropriate. When new hazard data becomes available it will be added to the MJHMP. New data will be confirmed at the annual committee meeting.

For whatever reason, a MJHMP update can be written anytime it is deemed necessary by the DC DEM.

The DC DEM will begin their update process three years from this plan’s adoption according to FEMA DMA2000 guidelines on local mitigation plan updates under the direction of the Director of JCEMA.



**Douglas County Mitigation Plan Committee  
Douglas County Multi-Jurisdictional Hazard Mitigation Plan  
Annual Report**

*Hazard Mitigation Plan Committee Chair:*

*Meeting Date:*

*Plan Approval Date:*

*Plan Expiration Date:*

Have there been any disasters or training events since the last report? If so, list them below:

| Disaster Number/Training Event | Hazard Type(s)    | Was the hazard expected or unforeseen? | Is a plan update required? |
|--------------------------------|-------------------|--|----------------------------|
|                                |                   |  |                            |
|                                |                   |  |                            |
| Example: DR-1000               | Volcanic Eruption | Unforeseen                             | Yes                        |
| Example: Annual Training       | Flash Flooding    | Expected                               | No                         |

**Mitigation Projects:**

| Project Name               | Participating Jurisdictions | Proposed/Schedules/In Progress/Completed | Behind/Ahead/On-Schedule | Estimated Completion Date |
|----------------------------|-----------------------------|--|--------------------------|---------------------------|
|                            |                             |  |                          |                           |
|                            |                             |  |                          |                           |
|                            |                             |  |                          |                           |
|                            |                             |  |                          |                           |
| Example: Tornado Safe Room | Waterville                  | In Progress                              | On-Schedule              | 1/1/2016                  |

**Miscellaneous Notes:**

## Section 2 – Community Profiles

Douglas County, Washington was created out of Lincoln County on November 28, 1883 and is named for the American statesman Stephen A. Douglas. The county in full has a total land area of 1,849 square miles. The U.S. Census Bureau estimates the April 2018 population of the county and its municipal subdivisions totals 42,907 occupying 16,985 residential housing units. 34.70% of its building stock is considered mid-century construction, 26.37% is considered late century construction, and 38.93% is considered modern construction.

**Table 2.1 – Construction Age**

| Jurisdiction         | Mid-Century | Late-Century | Modern |
|----------------------|-------------|--------------|--------|
| Uni-Douglas County   | 46.97%      | 36.99%       | 16.05% |
| Bridgeport           | 34.29%      | 24.34%       | 41.37% |
| Coulee Dam (Partial) | 63.31%      | 12.11%       | 24.59  |
| East Wenatchee       | 2.74%       | 16.58%       | 80.68% |
| Mansfield            | 88.39%      | 6.33%        | 5.28%  |
| Rock Island          | 25.62%      | 26.01%       | 48.37% |
| Waterville           | 84.56%      | 1.50%        | 13.94% |
| Total =              | 34.70%      | 26.37%       | 38.93% |

*\*The values are derived from data provided by the U.S. Census Bureau.*

The countywide population has been steadily growing since 2010, the year Douglas County completed development of their last plan. Individually, some municipalities have experienced population stagnation, with the majority of the county’s total growth occurring in Bridgeport, East Wenatchee, Rock Island, and the county at large. Whether or not this increase in population significantly increases Douglas County or this plan’s participating entities is discussed in Section 3 – Risk Assessment.

**Table 2.2 – Population Change**

| Year | Estimated Population | Percent Change from 2010 | Percent Change from 2014 |
|------|----------------------|--------------------------|--------------------------|
| 2010 | 38,431               | -                        | -                        |
| 2014 | 39,795               | 3.55%                    | -                        |
| 2018 | 42,907               | 11.65%                   | 7.82%                    |

*\*The data are from the U.S. Census Bureau*

The planning area contains an estimated \$3,461,076,000 worth of municipal structural inventory broken down into six different structural type classes. The table below shows this breakdown.

**Table 2.3 – Structural Inventory**

| Structure Class         | Structures | Total Class Value |
|-------------------------|------------|-------------------|
| Agricultural            | 204        | \$134,648,000     |
| Commercial              | 572        | \$317,346,000     |
| Government              | 28         | \$14,611,000      |
| Industrial              | 162        | \$45,117,000      |
| Residential             | 14,112     | \$2,738,135,000   |
| Multi-Unit Residential* | 131        | \$211,219,000     |
| Total =                 | 15,209     | \$3,461,076,000   |

*\*Multi-Unit Residential is defined as a structure with 5 or more residential units*

*\*\*The data are from the Federal Emergency Management Agency*

Map 2.1 – State of Washington



0 25 50 100 150 Miles



State Borders



County Borders



Douglas County



Data Sources: ESRI, FEMA, Silvis Labs, U.S. Census Bureau, USDA, USGS

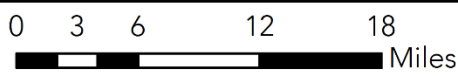
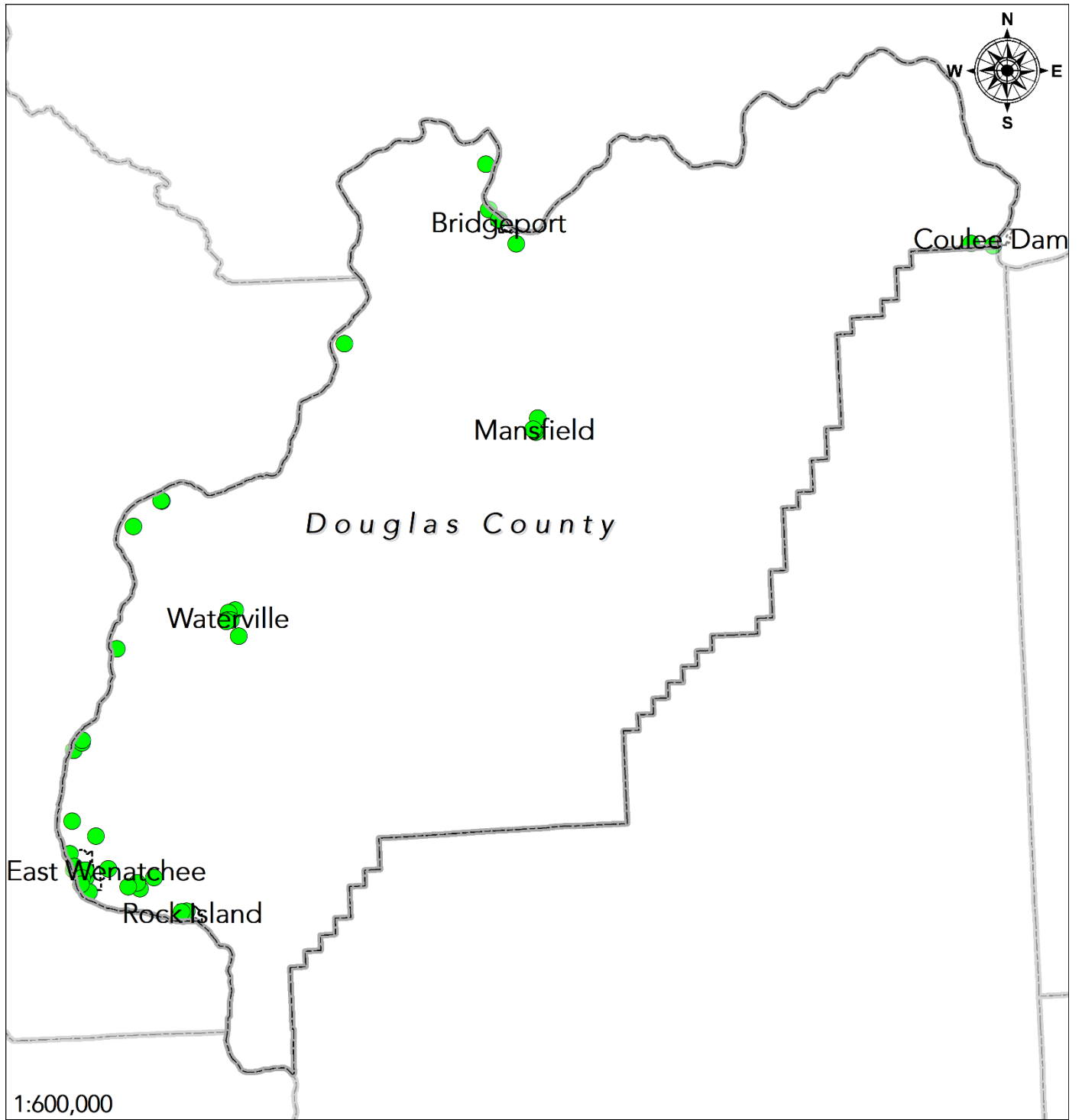
Douglas County DEM has identified a total of 50 critical facilities throughout the planning area. These facilities are deemed critical either by the nature in which they maintain basic services or that they house a high density of vulnerable populations. A breakdown by facility type of the 50 critical facilities is listed in the table below and shown in the map on the following page. A full list of critical facilities can be found in Appendix B.



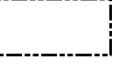
**Table 2.4 – Critical Facilities**

| Facility Type    | Critical Facilities |
|------------------|---------------------|
| Airport          | 4                   |
| Assisted Living  | 7                   |
| Culture Site     | 1                   |
| Fire Prevention  | 8                   |
| Hospital         | 1                   |
| Law Enforcement  | 2                   |
| Local Government | 9                   |
| Utility          | 11                  |
| Water Treatment  | 7                   |
| Total =          | 50                  |

*\*The data are from Douglas County*

Map 2.2 – Critical Facilities



-  State Borders
-  County Borders
-  Municipal Borders

 Critical Facilities



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

## 2.1 – Douglas County (Unincorporated)

The unincorporated portions of Douglas County have seen a significant increase in population, 15.84%, since the development of its last hazard mitigation plan in 2010. Most of the building stock in unincorporated Douglas County are concentrated around East Wenatchee and along the Columbia River. It's building stock consists of 45.19% mid-century, 35.59% late-century, and 19.22% modern construction.



Table 2.5 – Population Change, Douglas County (Unincorporated)

| Year | Estimated Population | Percent Change from 2010 | Percent Change from 2014 |
|------|----------------------|--------------------------|--------------------------|
| 2010 | 20,399               | -                        | -                        |
| 2014 | 21,361               | 4.72%                    | -                        |
| 2018 | 23,630               | 15.84%                   | 10.62%                   |

\*The data are from the U.S. Census Bureau

Table 2.6 – Structural Inventory, Douglas County (Unincorporated)

| Structure Class         | Structures   | Total Class Value      |
|-------------------------|--------------|------------------------|
| Agricultural            | 162          | \$92,444,000           |
| Commercial              | 236          | \$106,115,000          |
| Government              | 8            | \$3,846,000            |
| Industrial              | 88           | \$25,290,000           |
| Residential             | 8,571        | \$1,643,037,000        |
| Multi-Unit Residential* | 33           | \$62,802,000           |
| <b>Total =</b>          | <b>9,098</b> | <b>\$1,933,534,000</b> |

\*Multi-Unit Residential is defined as a structure with 5 or more residential units

\*\*The data are from the Federal Emergency Management Agency

**Table 2.7 – Critical Facilities by Location, Douglas County (Unincorporated)**

| <b>Name</b>                                    | <b>Type</b>     | <b>Owner</b>     |
|--|-----------------|------------------|
| Cherry Lane Country Haven                      | Assisted Living | Private          |
| Chief Joseph Substation                        | Utility         | Private          |
| Douglas County Sewage Lagoons #1               | Water Treatment | Private          |
| Douglas-Okanogan Fire District 15 – Station 40 | Fire Prevention | Fire District 15 |
| Electrical Substation #1                       | Utility         | Private          |
| Electrical Substation #2                       | Utility         | Private          |
| Electrical Substation #3                       | Utility         | Private          |
| Electrical Substation #4                       | Utility         | Private          |
| Electrical Substation #5                       | Utility         | Private          |
| Fire District 2 - Pangborn Station 2           | Fire Prevention | Fire District 2  |
| Fire District 4 Main Station                   | Fire Prevention | Fire District 4  |
| Grand Coulee Dam Power Switch Yard             | Utility         | Private          |
| Mansfield Sewage Lagoons                       | Water Treatment | Mansfield        |
| Pangborn Memorial Airport                      | Airport         | Private          |
| River View Airpark                             | Airport         | Private          |
| Rock Island Substation                         | Utility         | Private          |
| Rocky Reach Sewage Lagoons                     | Water Treatment | Private          |
| Rocky Reach Substation #1                      | Utility         | Private          |
| Rocky Reach Substation #2                      | Utility         | Private          |
| Senior Delight AFH                             | Assisted Living | Private          |
| Waterville Sewage Lagoons                      | Water Treatment | Waterville       |

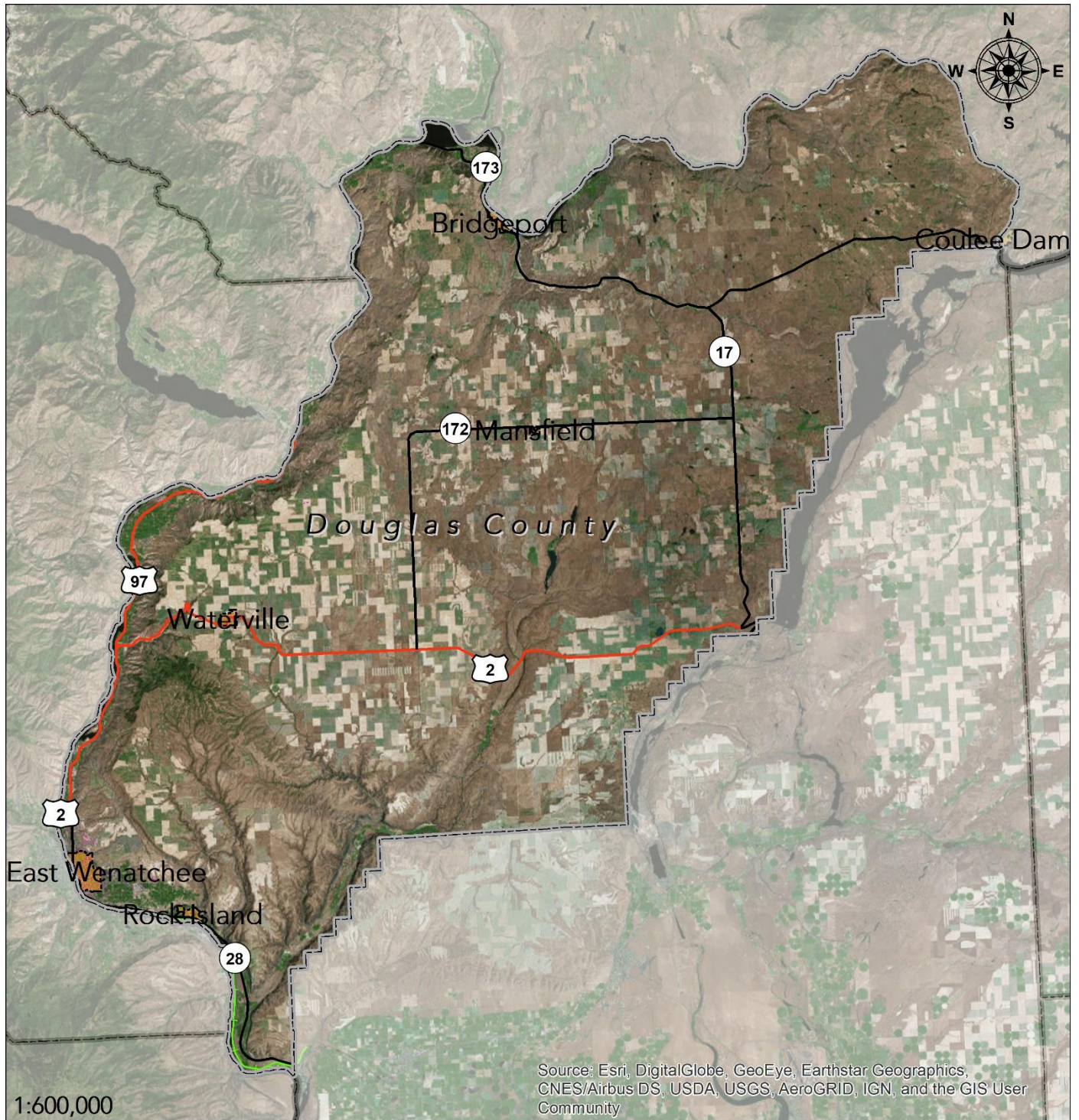
*\*The data are from Douglas County*

**Table 2.8 – Critical Facilities by Owner, Douglas County (Unincorporated)**

| <b>Name</b>                     | <b>Type</b>      | <b>Location</b> |
|---------------------------------|------------------|-----------------|
| Douglas County Courthouse       | Local Government | Waterville      |
| Douglas County Sheriff’s Office | Law Enforcement  | East Wenatchee  |

*\*The data are from Douglas County*

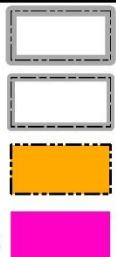
Map 2.3 – Community Profile, Douglas County



0 3 6 12 18 Miles



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS



State Borders

County Borders

Municipal Borders

Structures

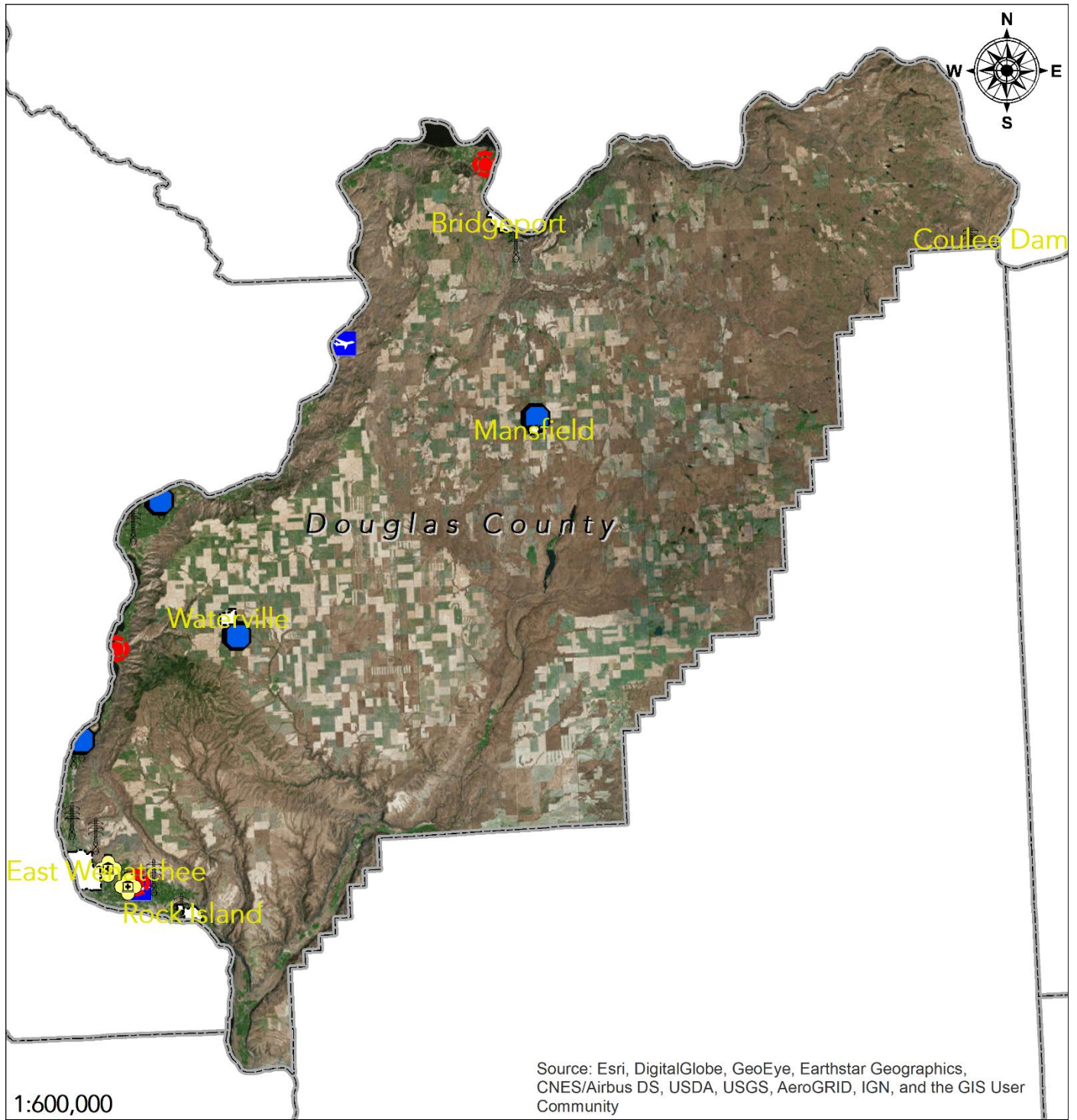
U.S. Highways

State Highways

Other Roads

Railways

Map 2.4 – Critical Facilities, Douglas County



1:600,000

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



- State Borders
- County Borders
- Municipal Borders
- Critical Facilities**
- Airport

- Assisted Living
- Culture Site
- Fire Prevention
- Hospital
- Law Enforcement
- Local Government
- Utility
- Water Treatment



Data Sources: ESRI, FEMA, Silvis Labs, U.S. Census Bureau, USDA, USGS

## 2.2 – Bridgeport

Bridgeport has grown at a mild rate of 6.06% since their last participation in a hazard mitigation plan. Most of this growth occurred since 2014, but still at a mild rate of 4.12%. Most of the city’s growth occurred between 1990 and 2010 and thus most of its building stock is of newer construction. 34.29% is considered mid-century, 24.34% is considered late-century, and 41.37% is considered modern.



**Table 2.9 – Population Change, Bridgeport**

| Year | Estimated Population | Percent Change from 2010 | Percent Change from 2014 |
|------|----------------------|--------------------------|--------------------------|
| 2010 | 2,409                | -                        | -                        |
| 2014 | 2,454                | 1.87%                    | -                        |
| 2018 | 2,555                | 4.12%                    | 6.06%                    |

\*The data are from the U.S. Census Bureau

**Table 2.10 – Structural Inventory, Bridgeport**

| Structure Class         | Structures | Total Class Value    |
|-------------------------|------------|----------------------|
| Agricultural            | 2          | \$2,595,000          |
| Commercial              | 20         | \$9,782,000          |
| Government              | 2          | \$304,000            |
| Industrial              | 3          | \$864,000            |
| Residential             | 618        | \$73,465,000         |
| Multi-Unit Residential* | 11         | \$15,986,000         |
| <b>Total =</b>          | <b>656</b> | <b>\$102,996,000</b> |

\*Multi-Unit Residential is defined as a structure with 5 or more residential units

\*\*The data are from the Federal Emergency Management Agency

**Table 2.11 – Critical Facilities by Location, Bridgeport**

| Name                                | Type             | Owner      |
|-------------------------------------|------------------|------------|
| Bridgeport City Hall                | Local Government | Bridgeport |
| Bridgeport Fire Station             | Fire Prevention  | Bridgeport |
| Bridgeport Water Treatment Facility | Water Treatment  | Bridgeport |

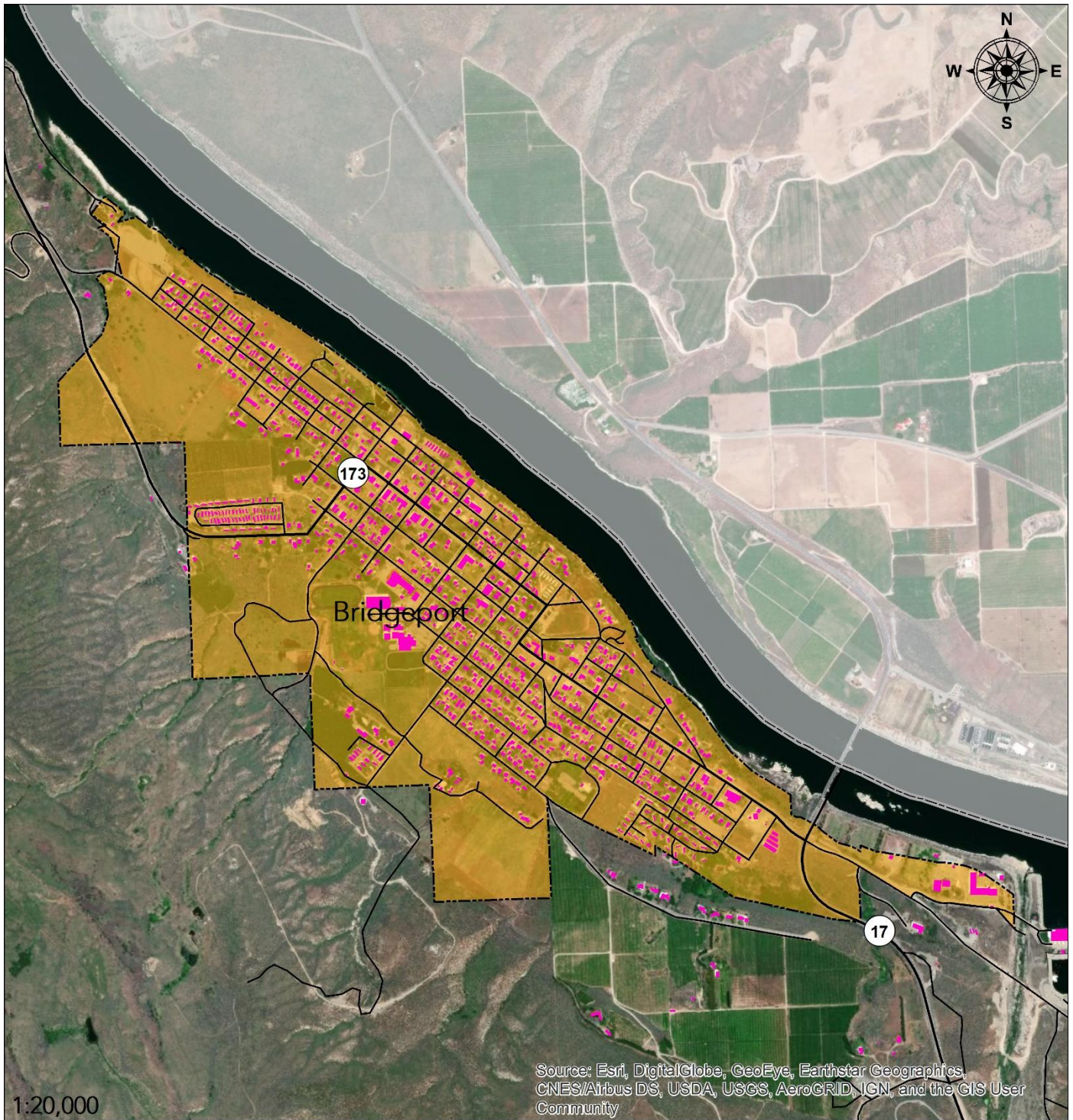
\*The data are from Douglas County

**Table 2.12 – Critical Facilities by Owner, Bridgeport**

| Name                                | Type             | Location   |
|-------------------------------------|------------------|------------|
| Bridgeport City Hall                | Local Government | Bridgeport |
| Bridgeport Fire Station             | Fire Prevention  | Bridgeport |
| Bridgeport Water Treatment Facility | Water Treatment  | Bridgeport |

\*The data are from Douglas County

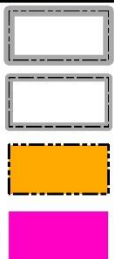
Map 2.5 – Community Profile, Bridgeport



0 0.1 0.2 0.4 0.6 Miles



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS



State Borders

County Borders

Municipal Borders

Structures

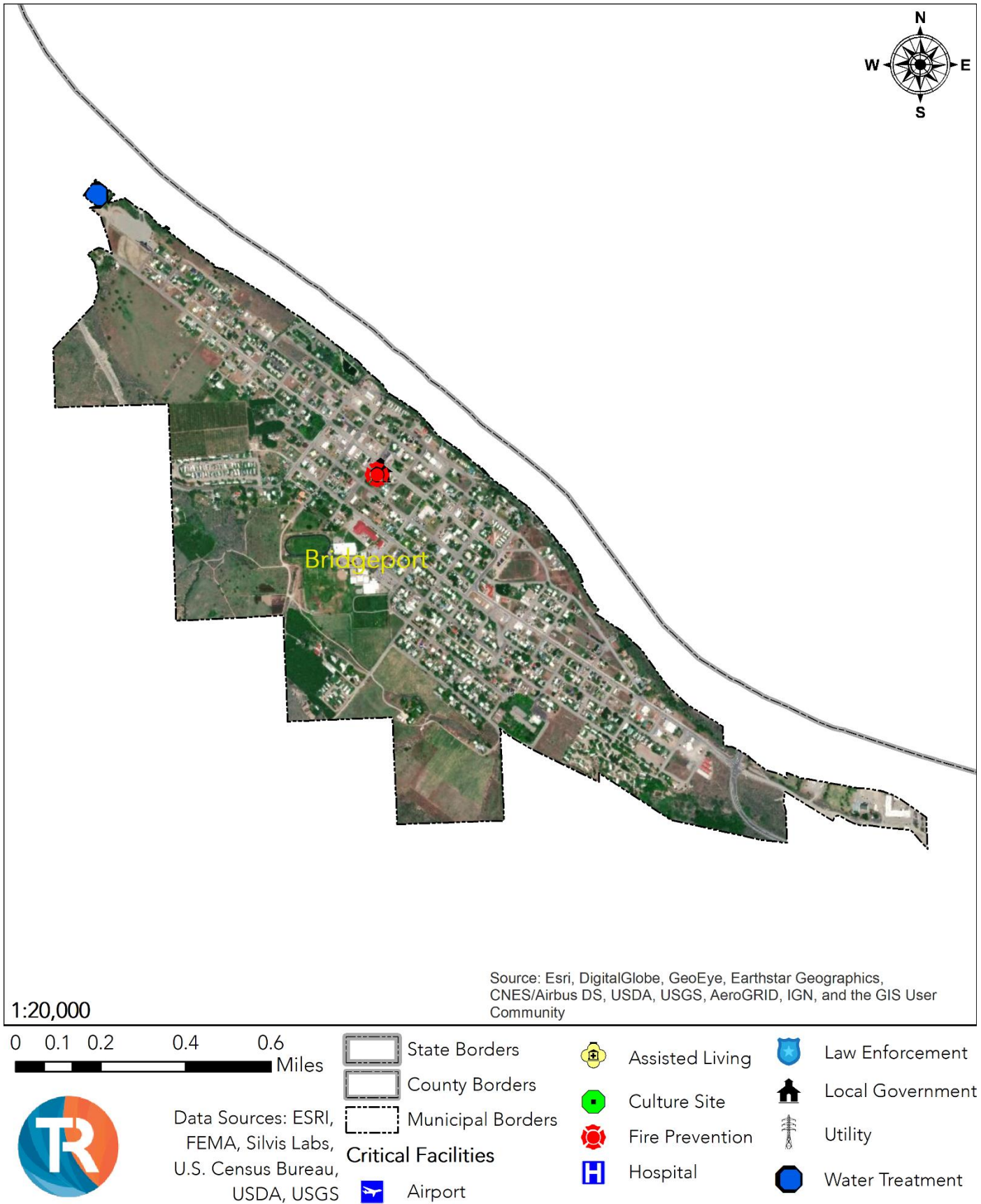
U.S. Highways

State Highways

Other Roads

Railways

Map 2.6 – Critical Facilities, Bridgeport



## 2.3 – Coulee Dam (Partial)

The majority of the City of Coulee Dam exists in Okanogan County to the east of Douglas County. However, a small portion of the city is within the planning area. It is estimated that of the cities 1079 residents, 187 live within the borders of Douglas County. We cannot calculate population change within the portion of the county, however for the purposes of this mitigation plan we do not need to as the population has been stagnant as whole, decreasing by 1.82% since 2010. We estimate that 63.31% of its building stock is mid-century, 12.11% is late-century, and 24.59% of it is modern.



Table 2.13 – Population Change, Coulee Dam

| Year | Estimated Population | Percent Change from 2010 | Percent Change from 2014 |
|------|----------------------|--------------------------|--------------------------|
| 2010 | 1,099                | -                        | -                        |
| 2014 | 1,082                | -1.55%                   | -                        |
| 2018 | 1,079                | -1.82%                   | -0.27%                   |

\*The data are from the U.S. Census Bureau

Table 2.14 – Structural Inventory, Coulee Dam

| Structure Class         | Structures | Total Class Value   |
|-------------------------|------------|---------------------|
| Agricultural            | 0          | \$0                 |
| Commercial              | 7          | \$4,395,000         |
| Government              | 1          | \$755,000           |
| Industrial              | 0          | \$0                 |
| Residential             | 91         | \$14,601,000        |
| Multi-Unit Residential* | 2          | \$763,000           |
| <b>Total =</b>          | <b>101</b> | <b>\$20,514,000</b> |

\*Multi-Unit Residential is defined as a structure with 5 or more residential units

\*\*The data are from the Federal Emergency Management Agency

Table 2.15 – Critical Facilities by Location, Coulee Dam

| Name                     | Type             | Owner      |
|--------------------------|------------------|------------|
| Coulee Dam City Hall     | Local Government | Coulee Dam |
| Coulee Dam Sewage Lagoon | Water Treatment  | Coulee Dam |

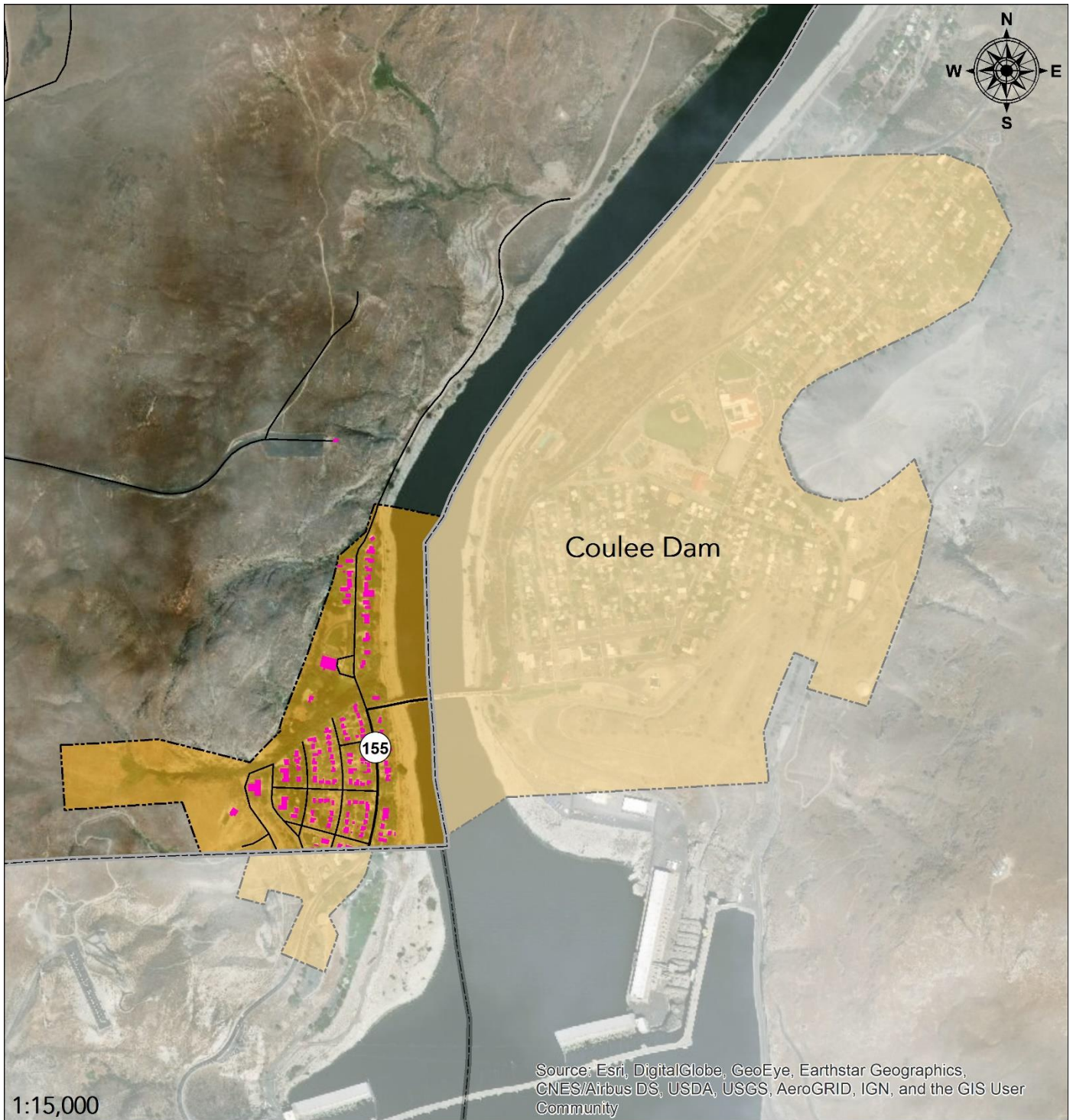
\*The data are from Douglas County

Table 2.16 – Critical Facilities by Owner, Coulee Dam

| Name                     | Type             | Location   |
|--------------------------|------------------|------------|
| Coulee Dam City Hall     | Local Government | Coulee Dam |
| Coulee Dam Sewage Lagoon | Water Treatment  | Coulee Dam |

\*The data are from Douglas County

Map 2.7 – Community Profile, Coulee Dam



1:15,000

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 0.075 0.15 0.3 0.45 Miles



State Borders



County Borders



Municipal Borders



Structures

— U.S. Highways

— State Highways

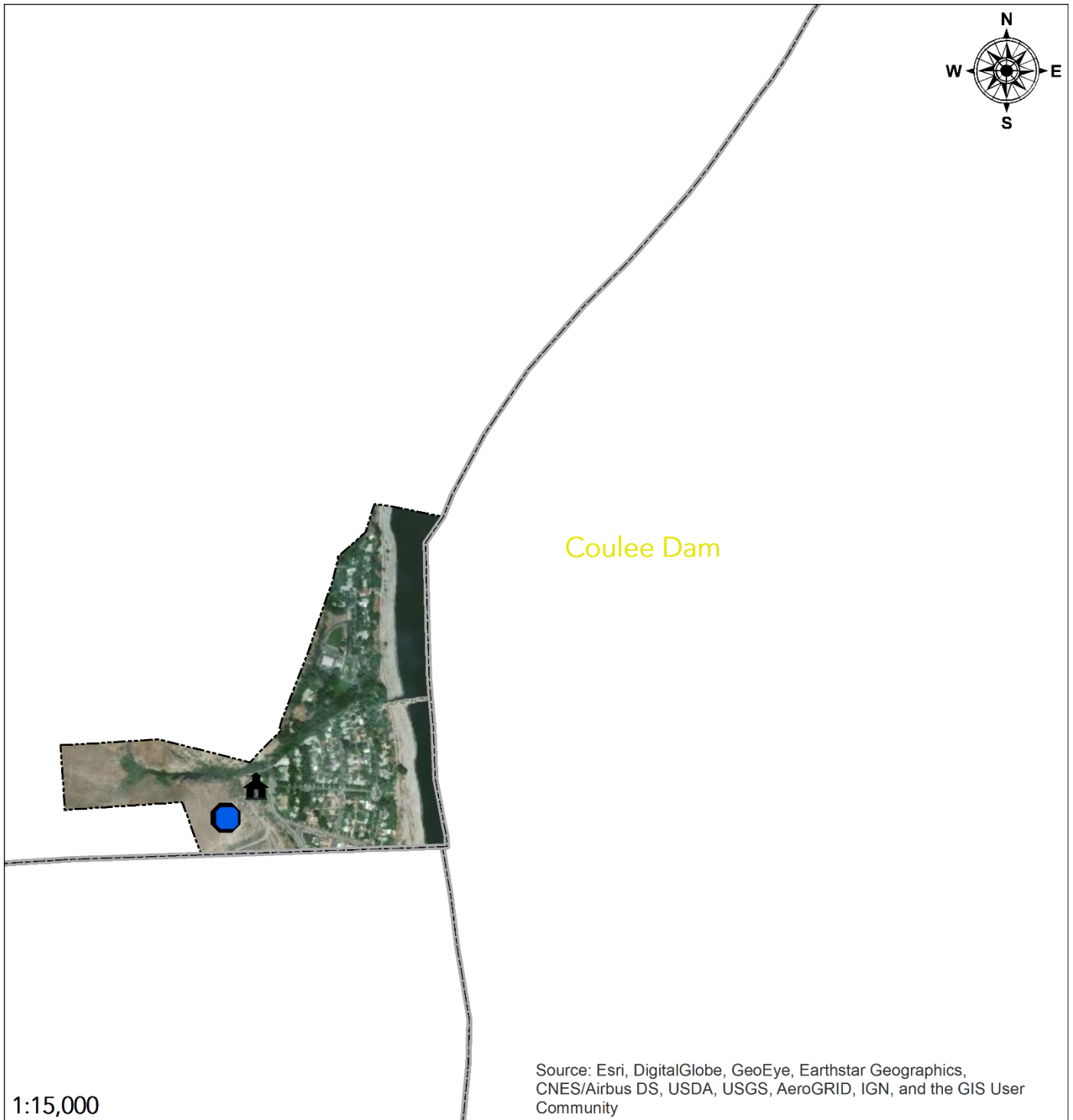
— Other Roads

— Railways



Data Sources: ESRI, FEMA, Silvis Labs, U.S. Census Bureau, USDA, USGS

Map 2.8 – Critical Facilities, Coulee Dam



1:15,000

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 0.075 0.15 0.3 0.45 Miles

-  State Borders
-  County Borders
-  Municipal Borders

**Critical Facilities**

 Airport

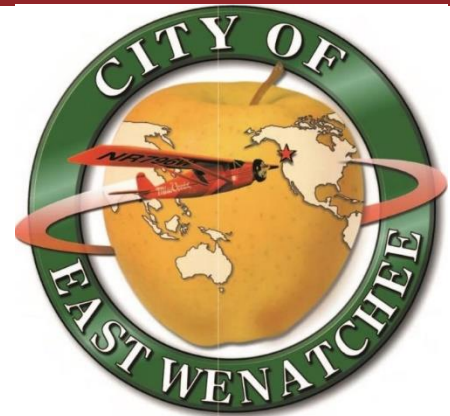
-  Assisted Living
-  Culture Site
-  Fire Prevention
-  Hospital
-  Law Enforcement
-  Local Government
-  Utility
-  Water Treatment

Data Sources: ESRI, FEMA, Silvis Labs, U.S. Census Bureau, USDA, USGS



## 2.4 – East Wenatchee

East Wenatchee has grown at a steady rate of 4.29% since their last participation in a hazard mitigation plan. Most of the city’s growth occurred during the 1990s and 2000s. As a result, its building stock is more modern than most portions of the planning area. 2.74% is considered mid-century, 16.58% is considered late-century, and 80.68% is considered modern.



**Table 2.17 – Population Change, East Wenatchee**

| Year | Estimated Population | Percent Change from 2010 | Percent Change from 2014 |
|------|----------------------|--------------------------|--------------------------|
| 2010 | 13,190               | -                        | -                        |
| 2014 | 13,408               | 1.65%                    | -                        |
| 2018 | 13,983               | 6.01%                    | 4.29%                    |

*\*The data are from the U.S. Census Bureau*

**Table 2.18 – Structural Inventory, East Wenatchee**

| Structure Class         | Structures   | Total Class Value      |
|-------------------------|--------------|------------------------|
| Agricultural            | 27           | \$35,552,000           |
| Commercial              | 267          | \$180,270,000          |
| Government              | 10           | \$7,267,000            |
| Industrial              | 64           | \$17,094,000           |
| Residential             | 3,905        | \$873,606,000          |
| Multi-Unit Residential* | 80           | \$125,260,000          |
| <b>Total =</b>          | <b>4,353</b> | <b>\$1,239,049,000</b> |

*\*Multi-Unit Residential is defined as a structure with 5 or more residential units*

*\*\*The data are from the Federal Emergency Management Agency*

**Table 2.19 – Critical Facilities by Location, East Wenatchee**

| Name                                     | Type             | Owner           |
|--|------------------|-----------------|
| Aging & Adult Care of Central Washington | Assisted Living  | Private         |
| Douglas County Public Utility District   | Local Government | Private         |
| Douglas County Sewage Treatment Plant    | Water Treatment  | Private         |
| Douglas County Sewer District Office     | Local Government | Private         |
| Douglas County Sheriff’s Office          | Law Enforcement  | County          |
| East Wenatchee City Hall                 | Local Government | East Wenatchee  |
| East Wenatchee Police Department         | Law Enforcement  | East Wenatchee  |
| Fire District 2 Main Station             | Fire Prevention  | Fire District 2 |
| Prestige Senior Living                   | Assisted Living  | Private         |
| ResCare HomeCare                         | Assisted Living  | Private         |
| Wenatchee Assisted Living                | Assisted Living  | Private         |

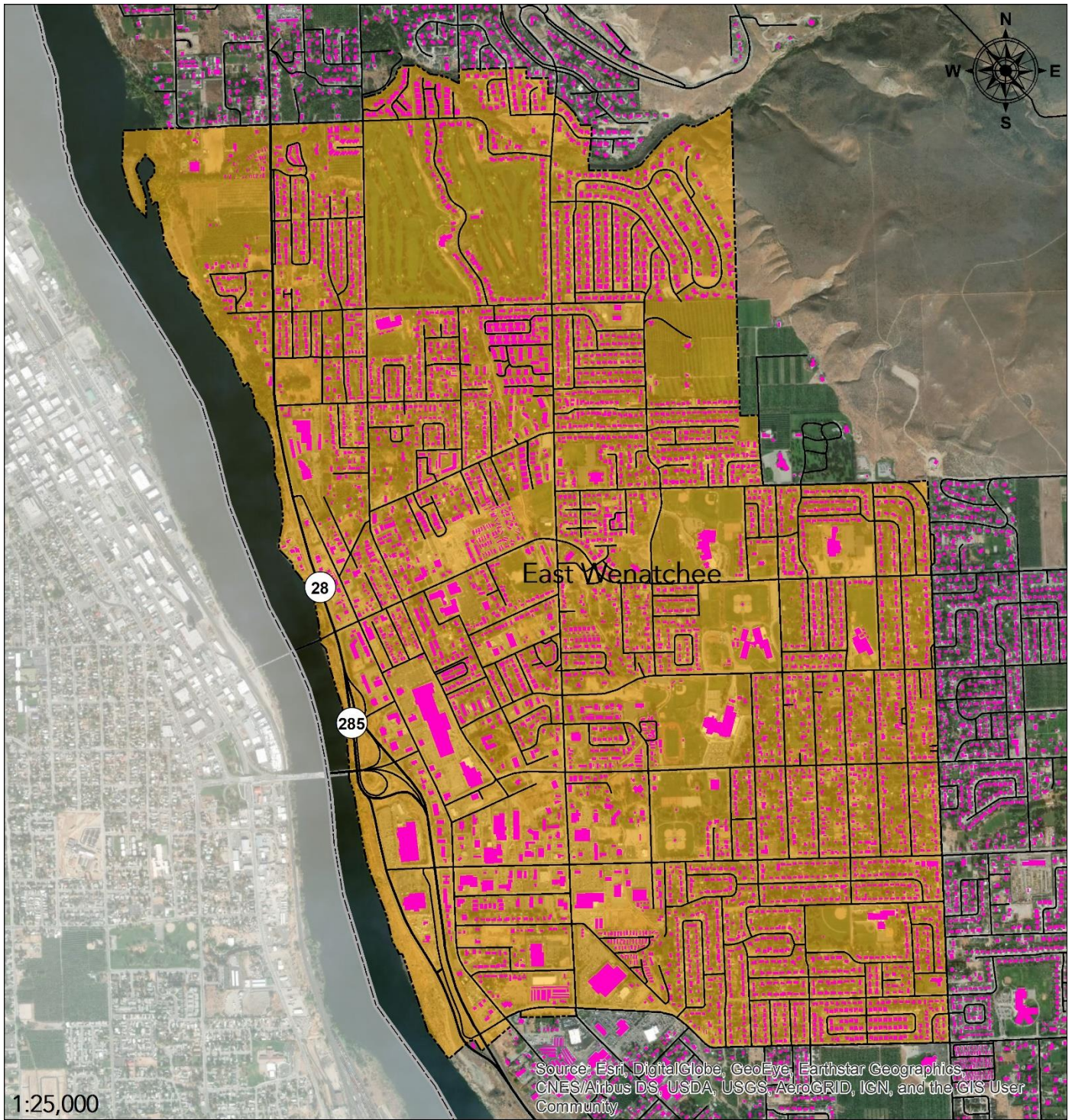
*\*The data are from Douglas County*

**Table 2.20 – Critical Facilities by Owner, East Wenatchee**

| Name                             | Type             | Location       |
|----------------------------------|------------------|----------------|
| East Wenatchee City Hall         | Local Government | East Wenatchee |
| East Wenatchee Police Department | Law Enforcement  | East Wenatchee |

*\*The data are from Douglas County*









Map 2.9 – Community Profile, East Wenatchee



0 0.125 0.25 0.5 0.75 Miles



Data Sources: ESRI, FEMA, Silvis Labs, U.S. Census Bureau, USDA, USGS

-  State Borders
-  County Borders
-  Municipal Borders
-  Structures
-  U.S. Highways
-  State Highways
-  Other Roads
-  Railways

Map 2.10 – Critical Facilities, East Wenatchee



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

1:25,000

0 0.125 0.25 0.5 0.75 Miles

-  State Borders
-  County Borders
-  Municipal Borders
- Critical Facilities**
-  Airport

-  Assisted Living
-  Culture Site
-  Fire Prevention
-  Hospital
-  Law Enforcement
-  Local Government
-  Utility
-  Water Treatment

Data Sources: ESRI, FEMA, Silvis Labs, U.S. Census Bureau, USDA, USGS



## 2.5 – Mansfield

Mansfield has seen minimal growth since the participation in their last hazard mitigation plan in 2010 and even a decrease in population during the middle of the 20<sup>th</sup> century. As a result, the majority of its building stock is of older construction. 88.39% of is considered mid-century, 6.33% is considered late-century, and 5.28% is considered modern.

**Table 2.21 – Population Change, Mansfield**

| Year | Estimated Population | Percent Change from 2010 | Percent Change from 2014 |
|------|----------------------|--------------------------|--------------------------|
| 2010 | 320                  | -                        | -                        |
| 2014 | 332                  | 3.75%                    | -                        |
| 2018 | 339                  | 5.94%                    | 2.11%                    |

*\*The data are from the U.S. Census Bureau*

**Table 2.22 – Structural Inventory, Mansfield**

| Structure Class         | Structures | Total Class Value   |
|-------------------------|------------|---------------------|
| Agricultural            | 4          | \$1,188,000         |
| Commercial              | 7          | \$2,264,000         |
| Government              | 1          | \$280,000           |
| Industrial              | 0          | \$77,000            |
| Residential             | 166        | \$26,000,000        |
| Multi-Unit Residential* | 0          | \$0                 |
| <b>Total =</b>          | <b>178</b> | <b>\$29,809,000</b> |

*\*Multi-Unit Residential is defined as a structure with 5 or more residential units*

*\*\*The data are from the Federal Emergency Management Agency*

**Table 2.23 – Critical Facilities by Location, Mansfield**

| Name                         | Type             | Owner           |
|------------------------------|------------------|-----------------|
| Fire District 5 Main Station | Fire Prevention  | Fire District 5 |
| Mansfield Airport            | Airport          | Mansfield       |
| Mansfield City Hall          | Local Government | Mansfield       |

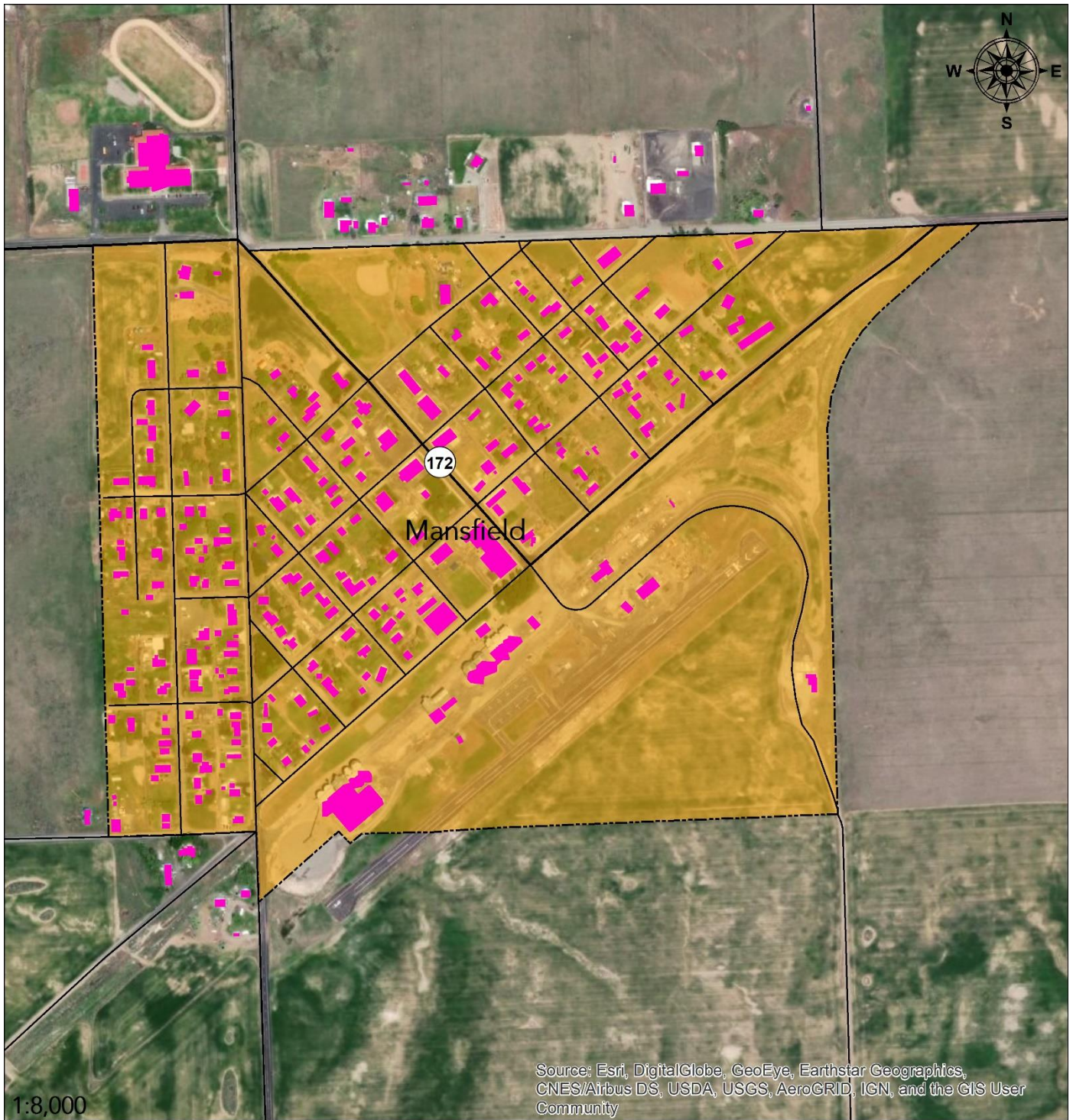
*\*The data are from Douglas County*

**Table 2.24 – Critical Facilities by Owner, Mansfield**

| Name                     | Type             | Location  |
|--------------------------|------------------|-----------|
| Mansfield Airport        | Airport          | Mansfield |
| Mansfield City Hall      | Local Government | Mansfield |
| Mansfield Sewage Lagoons | Water Treatment  | Private   |

*\*The data are from Douglas County*

Map 2.11 – Community Profile, Mansfield



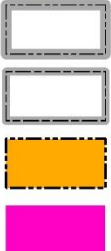
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

1:8,000

0 0.0425 0.085 0.17 0.255 Miles



Data Sources: ESRI, FEMA, Silvis Labs, U.S. Census Bureau, USDA, USGS



State Borders

County Borders

Municipal Borders

Structures

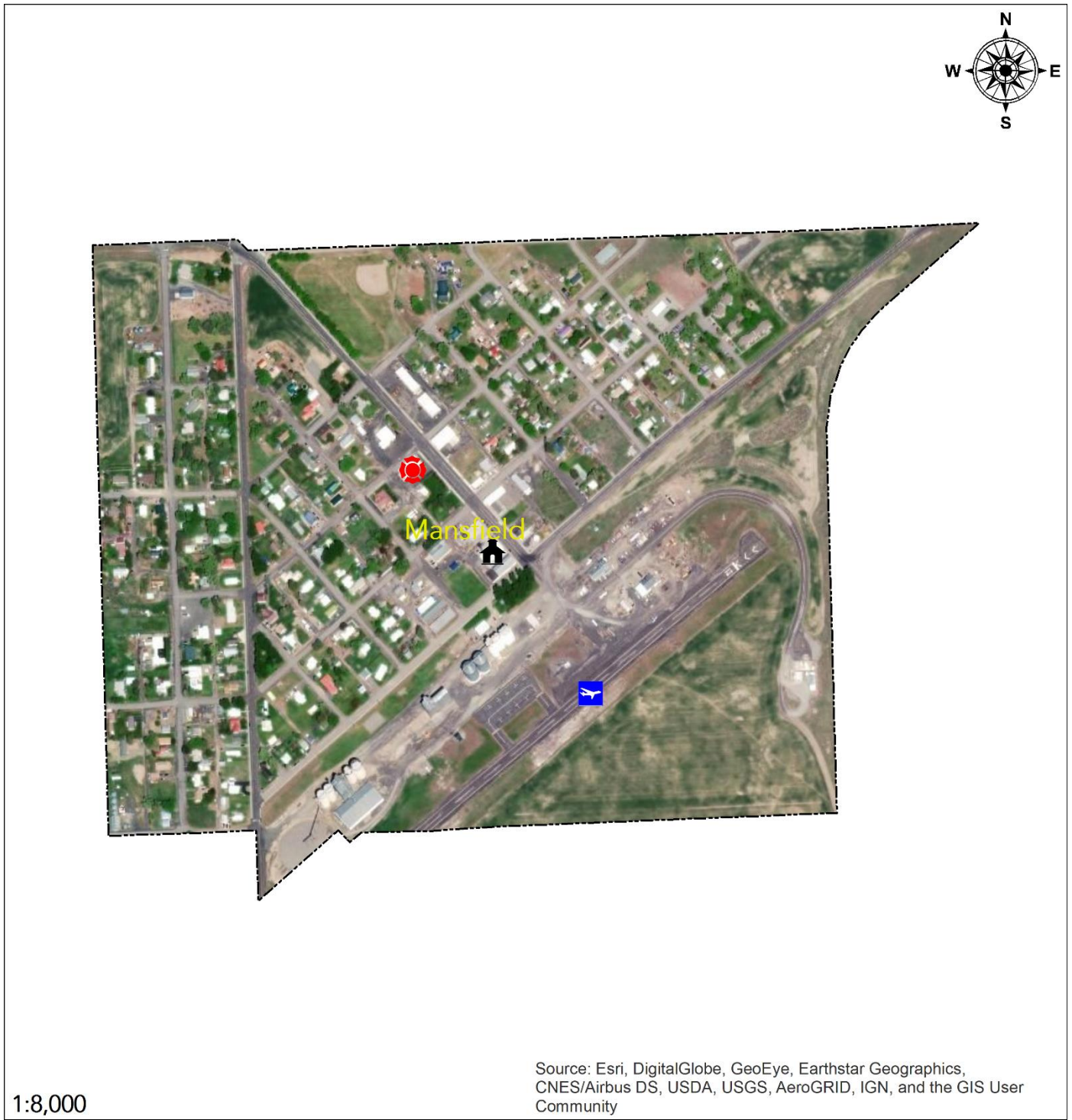
U.S. Highways

State Highways

Other Roads

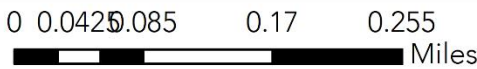
Railways

Map 2.12 – Critical Facilities, Mansfield



1:8,000

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



- State Borders
- County Borders
- Municipal Borders



Data Sources: ESRI, FEMA, Silvis Labs, U.S. Census Bureau, USDA, USGS

- Critical Facilities**
- Airport

- Assisted Living
- Culture Site
- Fire Prevention
- Hospital
- Law Enforcement
- Local Government
- Utility
- Water Treatment

## 2.6 – Rock Island

Rock Island has seen staggeringly high growth since the late 20<sup>th</sup> century. Its population has grown by 28.81% since their participation in a hazard mitigation plan. As a result, their building stock is more modern than most of the planning area. 25.62% is considered mid-century, 26.01% is considered late-century, and 48.37% is considered modern.



**Table 2.25 – Population Change, Rock Island**

| Year | Estimated Population | Percent Change from 2010 | Percent Change from 2014 |
|------|----------------------|--------------------------|--------------------------|
| 2010 | 788                  | -                        | -                        |
| 2014 | 891                  | 13.07%                   | -                        |
| 2018 | 1,015                | 28.81%                   | 13.92%                   |

*\*The data are from the U.S. Census Bureau*

**Table 2.26 – Structural Inventory, Rock Island**

| Structure Class         | Structures | Total Class Value   |
|-------------------------|------------|---------------------|
| Agricultural            | 3          | \$1,434,000         |
| Commercial              | 12         | \$4,144,000         |
| Government              | 1          | \$451,000           |
| Industrial              | 2          | \$226,000           |
| Residential             | 310        | \$40,146,000        |
| Multi-Unit Residential* | 1          | \$1,109,000         |
| <b>Total =</b>          | <b>329</b> | <b>\$47,510,000</b> |

*\*Multi-Unit Residential is defined as a structure with 5 or more residential units*

*\*\*The data are from the Federal Emergency Management Agency*

**Table 2.27 – Critical Facilities by Location, Rock Island**

| Name                                    | Type             | Owner           |
|---|------------------|-----------------|
| Fire District 2 - Rock Island Station 3 | Fire Prevention  | Fire District 2 |
| Rock Island City Clerk Office           | Local Government | Rock Island     |

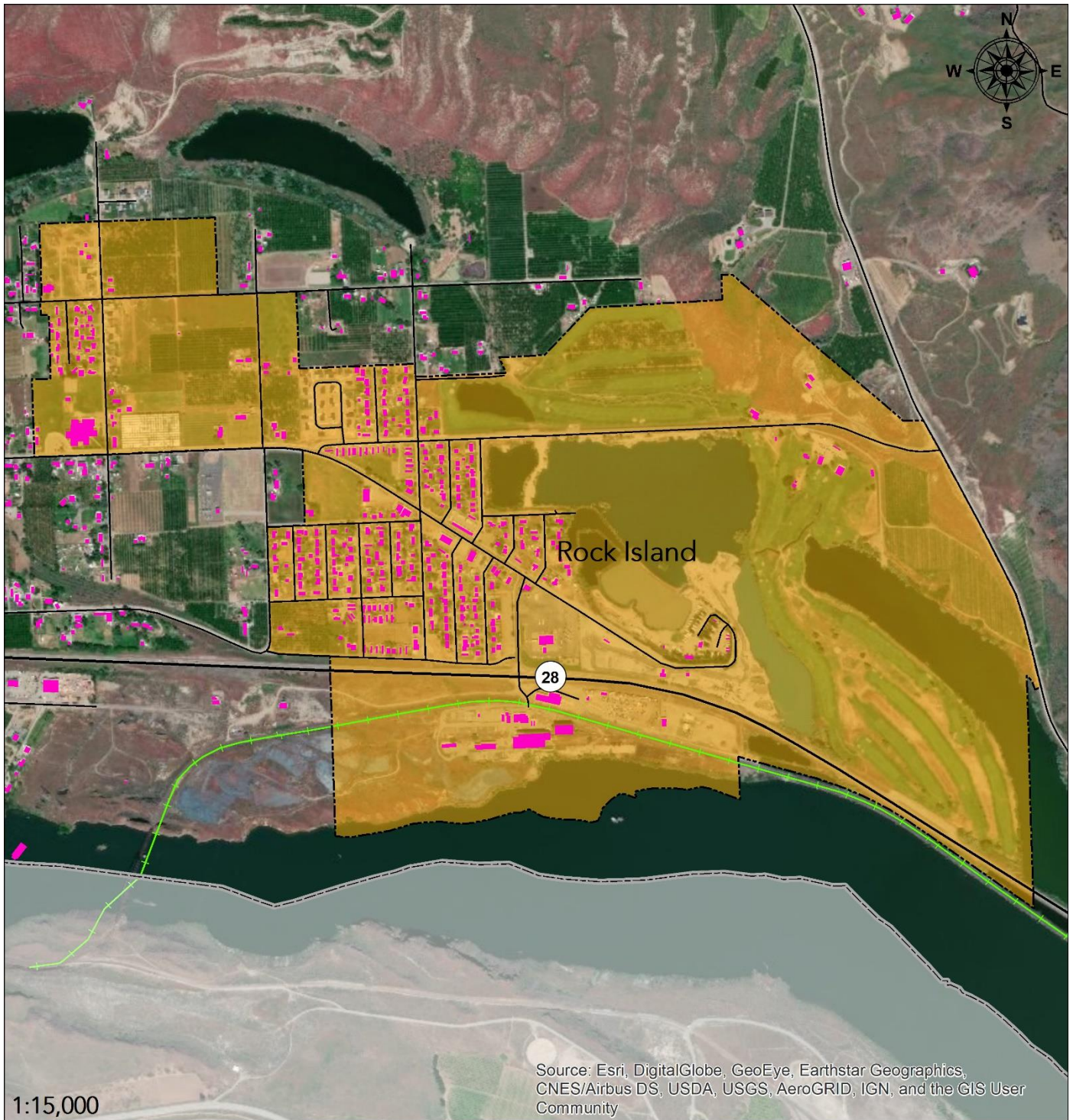
*\*The data are from Douglas County*

**Table 2.28 – Critical Facilities by Owner, Rock Island**

| Name                          | Type             | Owner       |
|-------------------------------|------------------|-------------|
| Rock Island City Clerk Office | Local Government | Rock Island |
| Rock Island Substation        | Utility          | Rock Island |

*\*The data are from Douglas County*

Map 2.13 – Community Profile, Rock Island



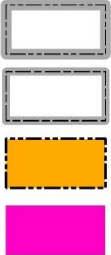
1:15,000

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 0.075 0.15 0.3 0.45 Miles



Data Sources: ESRI, FEMA, Silvis Labs, U.S. Census Bureau, USDA, USGS



State Borders

County Borders

Municipal Borders

Structures

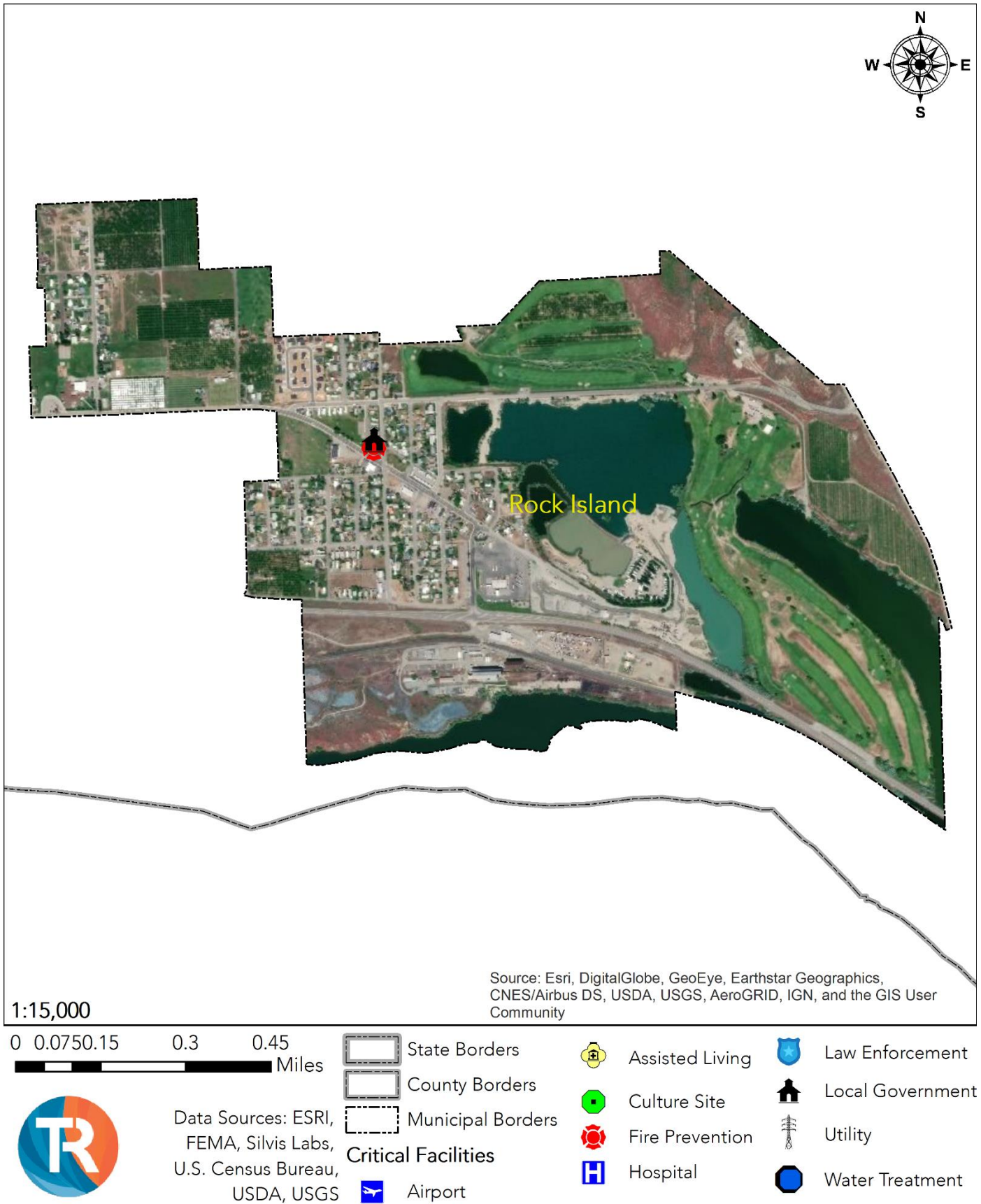
U.S. Highways

State Highways

Other Roads

Railways

Map 2.14 – Critical Facilities, Rock Island



## 2.7 – Waterville

Waterville has seen moderate growth since their last participation in a hazard mitigation plan. However, during the late 20<sup>th</sup> century, it experienced a significant decrease in population. As a result, the majority of its building stock is older, with some portion being of modern construction. 84.56% is considered mid-century, 1.50% is considered late-century, and 13.94% is considered modern.



Table 2.29 – Population Change, Waterville

| Year | Estimated Population | Percent Change from 2010 | Percent Change from 2014 |
|------|----------------------|--------------------------|--------------------------|
| 2010 | 1,138                | -                        | -                        |
| 2014 | 1,162                | 2.11%                    | -                        |
| 2018 | 1,198                | 5.27%                    | 3.10%                    |

\*The data are from the U.S. Census Bureau

Table 2.30 – Structural Inventory, Waterville

| Structure Class         | Structures | Total Class Value   |
|-------------------------|------------|---------------------|
| Agricultural            | 6          | \$1,435,000         |
| Commercial              | 23         | \$10,376,000        |
| Government              | 5          | \$1,708,000         |
| Industrial              | 5          | \$1,566,000         |
| Residential             | 451        | \$67,280,000        |
| Multi-Unit Residential* | 4          | \$5,299,000         |
| <b>Total =</b>          | <b>494</b> | <b>\$87,664,000</b> |

\*Multi-Unit Residential is defined as a structure with 5 or more residential units

\*\*The data are from the Federal Emergency Management Agency

Table 2.31 – Critical Facilities by Location, Waterville

| Name                  | Type             | Owner      |
|-----------------------|------------------|------------|
| Douglas County Museum | Education        | Waterville |
| Waterville Airport    | Airport          | Waterville |
| Waterville City Hall  | Local Government | Waterville |
| Waterville Substation | Utility          | Waterville |

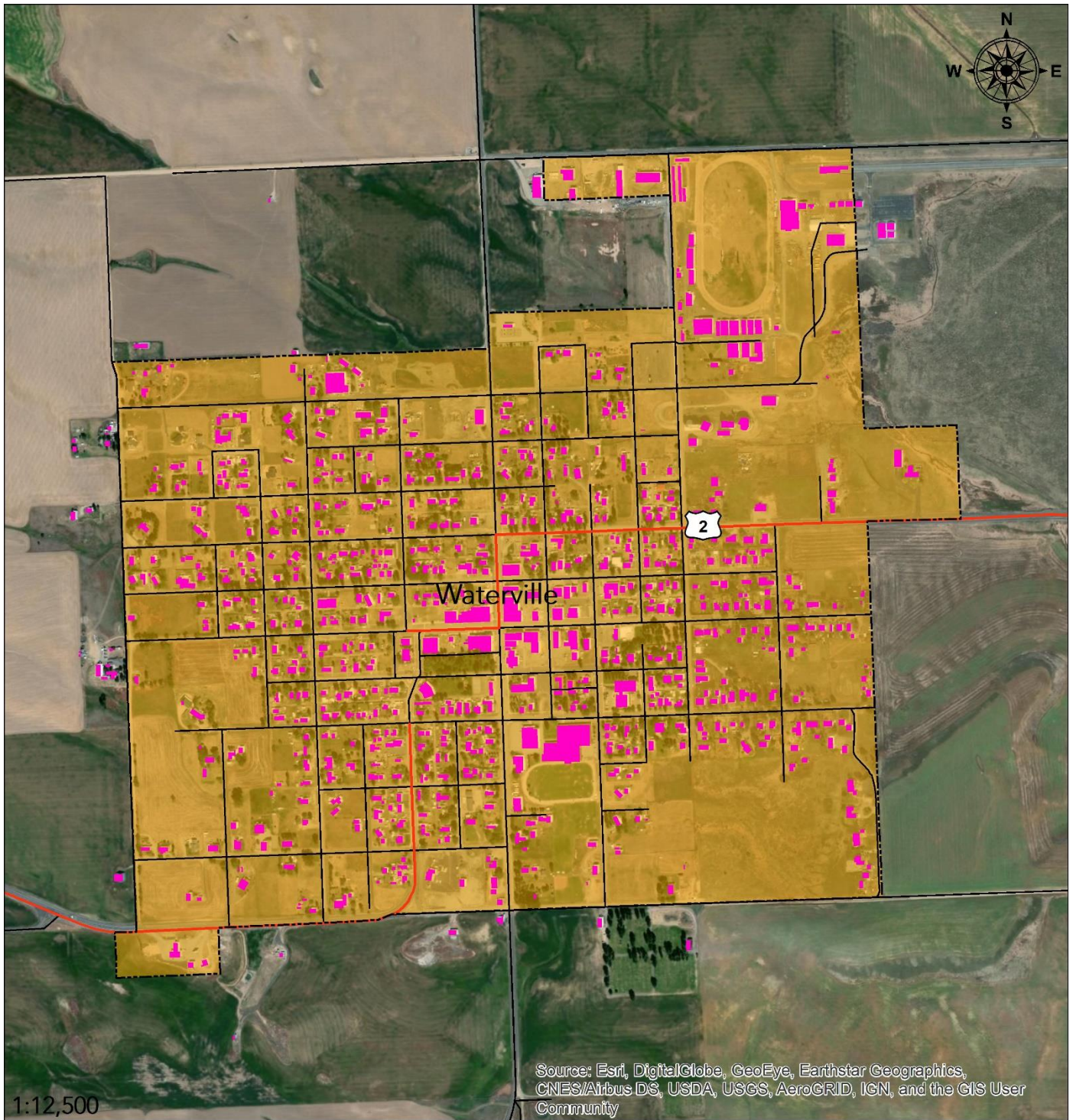
\*The data are from Douglas County

Table 2.32 – Critical Facilities by Location, Waterville

| Name                      | Type             | Location   |
|---------------------------|------------------|------------|
| Douglas County Museum     | Education        | Waterville |
| Waterville Airport        | Airport          | Waterville |
| Waterville City Hall      | Local Government | Waterville |
| Waterville Sewage Lagoons | Water Treatment  | Private    |
| Waterville Substation     | Utility          | Waterville |

\*The data are from Douglas County

Map 2.15 – Community Profile, Waterville



1:12,500

0 0.05 0.1 0.2 0.3 Miles



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS



State Borders



County Borders



Municipal Borders



Structures

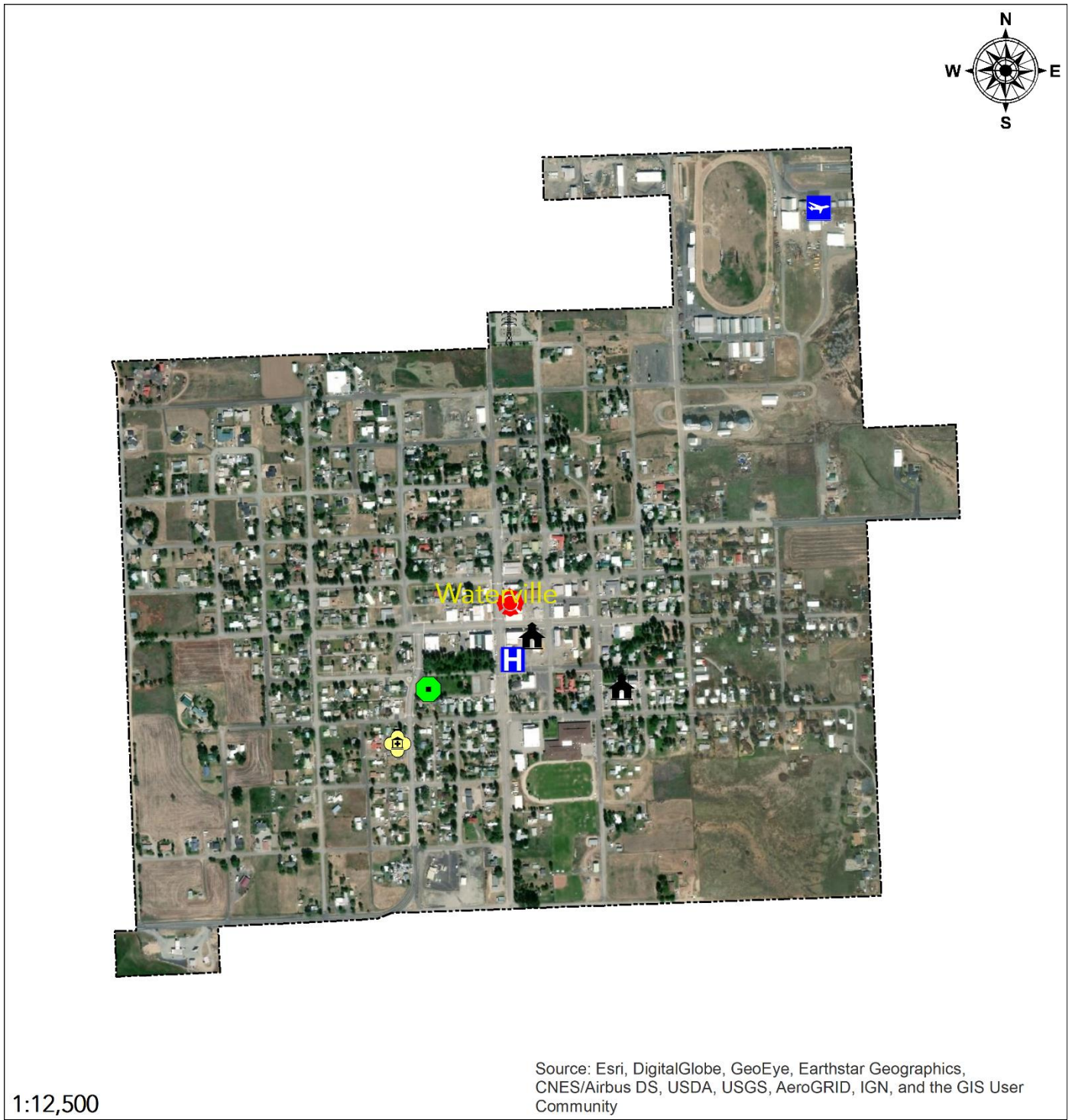
— U.S. Highways

— State Highways

— Other Roads

— Railways

Map 2.16 – Critical Facilities, Waterville



1:12,500

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 0.05 0.1 0.2 0.3 Miles

 State Borders  
 County Borders  
 Municipal Borders

**Critical Facilities**

 Airport

 Assisted Living  
 Culture Site  
 Fire Prevention  
 Hospital

 Law Enforcement  
 Local Government  
 Utility  
 Water Treatment

Data Sources: ESRI, FEMA, Silvis Labs, U.S. Census Bureau, USDA, USGS



## 2.8 – Eastmont School District

The Eastmont School District services unincorporated portions of Douglas County, East Wenatchee, and Rock Island. It accomplished this through 3

administrative sites and 9 education sites. They provide education for 6,178 students provided by 719 teachers, administrators, and support staff. A full breakdown of their structural values can be found in Appendix C.



**Table 2.33 – Eastmont School District Demographics**

| District Site                | Staff | Students     |
|------------------------------|-------|--------------|
| Cascade Elementary           |       | 512          |
| Clovis Point Intermediate    |       | 701          |
| District Office              |       | -            |
| Eastmont Junior High         |       | 929          |
| Eastmont Senior High         |       | 1,486        |
| Kenroy Elementary            |       | 466          |
| Maintenance & Transportation |       | -            |
| Robert E. Lee Elementary     |       | 454          |
| Rock Island Elementary       |       | 211          |
| Sterling Intermediate        |       | 921          |
| Technology Services          |       | -            |
| Ulysses S. Grant Elementary  |       | 498          |
| <b>Total =</b>               |       | <b>6,178</b> |

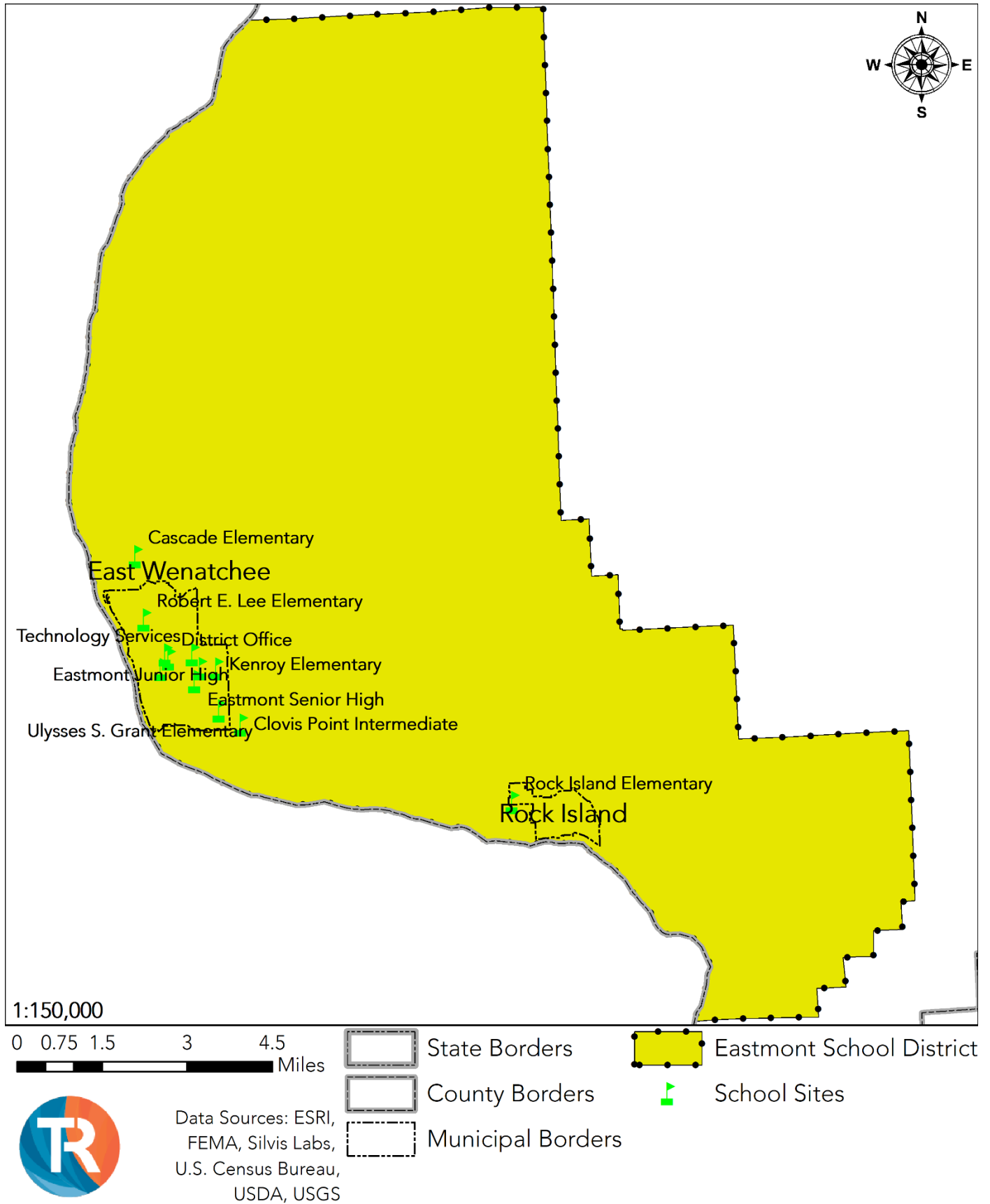
*\*The data are from the Eastmont School District.*

**Table 2.34 – Eastmont School District Structural Summary**

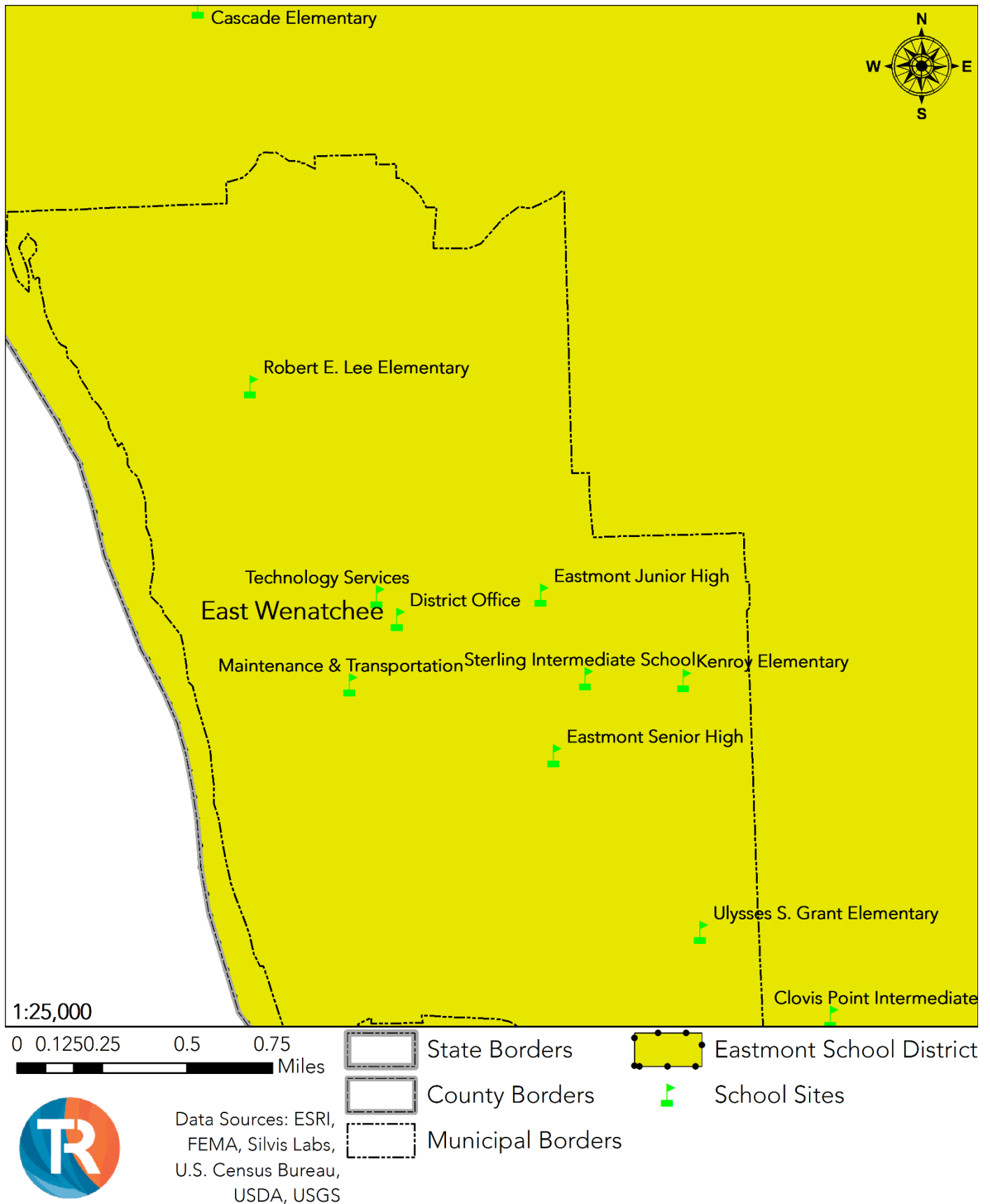
| District Site                | Contents Value      | Structural Value     | Total Value          |
|------------------------------|---------------------|----------------------|----------------------|
| Clovis Point Intermediate    | \$1,681,600         | \$18,922,000         | \$20,603,600         |
| District Office              | \$202,000           | \$1,150,200          | \$1,352,200          |
| Eastmont Junior High         | \$4,780,800         | \$43,578,800         | \$48,359,600         |
| Eastmont Senior High         | \$4,792,600         | \$55,834,000         | \$60,626,600         |
| Ulysses S. Grant Elementary  | \$1,062,000         | \$12,318,500         | \$13,380,500         |
| Kenroy Elementary            | \$1,187,900         | \$8,635,700          | \$9,823,600          |
| Maintenance & Transportation | \$4,235,500         | \$693,500            | \$4,929,000          |
| Robert E. Lee Elementary     | \$722,400           | \$6,664,300          | \$7,386,700          |
| Rock Island Elementary       | \$890,300           | \$9,799,000          | \$10,689,300         |
| Sterling Intermediate        | \$2,168,900         | \$22,375,700         | \$24,544,600         |
| Technology Services          | \$203,600           | \$811,400            | \$1,015,000          |
| <b>Total =</b>               | <b>\$21,927,600</b> | <b>\$180,783,100</b> | <b>\$202,710,700</b> |

*\*The data are from the Eastmont School District.*

Map 2.17 – Eastmont School District



Map 2.18 – Eastmont School District, 1:25,000



## 2.9 – Foster Creek Conservation District

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The Foster Creek Conservation District (FCCD) was created in 1942 and is located in North Central Washington in Douglas County. One of 45 Districts in the state, the FCCD is mandated under the Revised Code of Washington 89.08 to develop and administer voluntary, non-regulatory programs to conserve natural resources. Governed by a board of volunteer supervisors from the local community, the Foster Creek Conservation District identifies local conservation problems, guides voluntary local solutions, and sets policies where needed. They partner with landowners and operators in Douglas County as well as neighboring counties and the State of Washington.



Specifically, as it relates to natural hazards, the FCCD engages in wildfire prevention and restoration and lists it as one of its top natural resource priorities. More detailed information on its programs and affected areas are found in Sections 3 and 4 of this plan.

## 2.10 – Fire Protection Districts

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The majority of fire prevention and suppression activities throughout the planning area are conducted by special governmental organizations known as fire protection districts. These districts are funded by both county and municipal governments and have areas of responsibility that cross their borders.



A small area in the south of Douglas County is not codified as protected by a specific fire protection district while the City of Bridgeport has its own municipal fire department. The rest of the county and its municipalities area covered by seven fire protection districts. Some of these fire protection districts have areas of responsibilities that cross county lines.

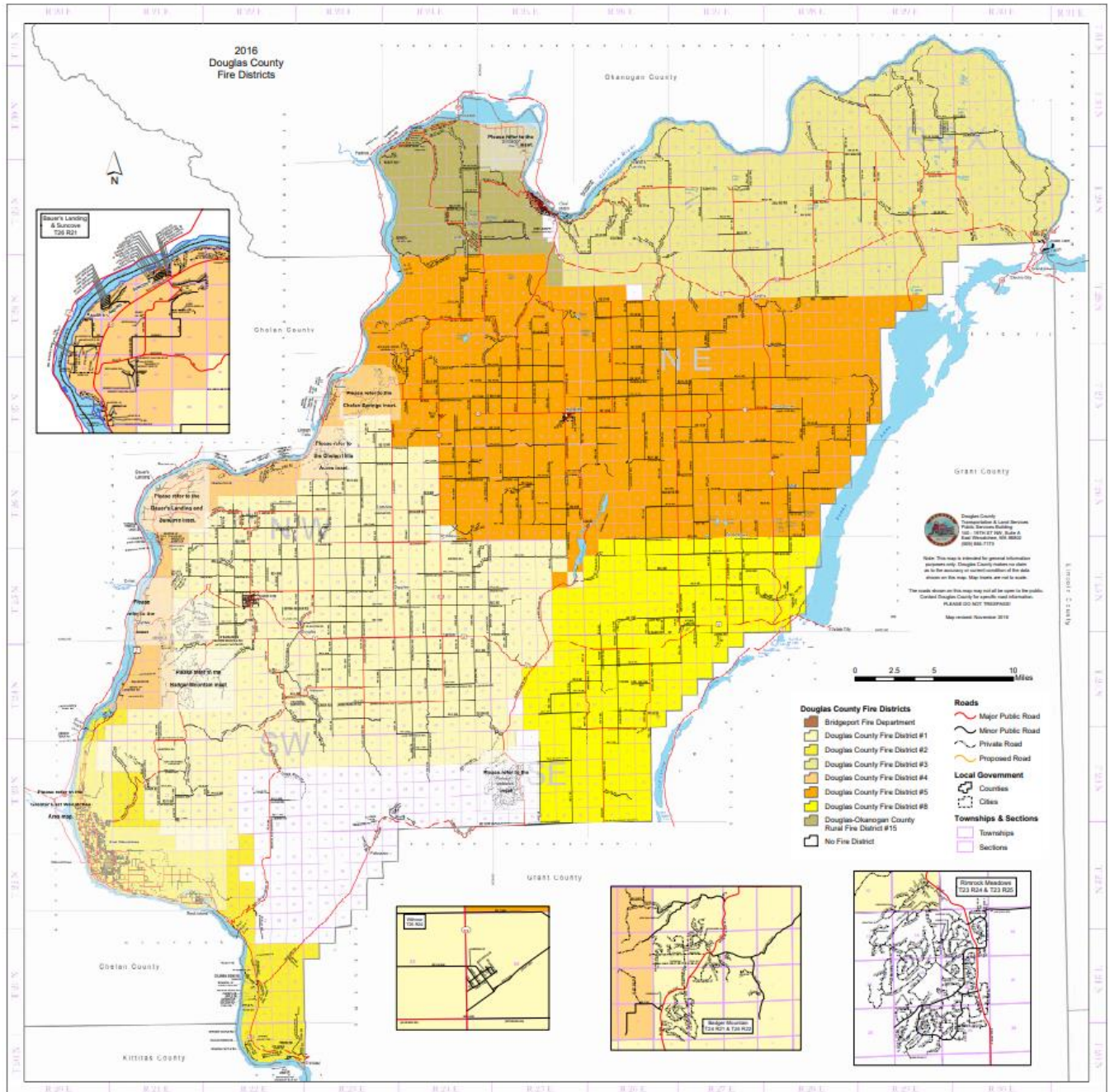
Map 2.18 on the following page shows the areas of responsibility for each fire protection district.

## 2.11 – Douglas County Public Utility District (PUD)

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Douglas County and all municipalities within it are served by a single PUD. The Douglas County Public Utility District is responsible for maintaining electrical transportation infrastructure and electrical service delivery. The PUD's vulnerabilities and risks are assessed under the 'vulnerability of and impact on systems' subsection in each hazard profile.

Map 2.18 – Fire Protection Districts





## Section 3 – Risk Assessment

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### *Purpose*

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This hazard mitigation plan's risk assessment depicts each participating entity's risk to each of the profiled hazards. These calculated risks serve as the justifying basis for the proposed mitigation activities and projects found in Section 4. Additionally, this risk assessment can further serve Douglas County and the plan's participating entities by aiding in decision making processes of other planning initiatives.

### *Intent*

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The hazards profiled within this section were identified and selected based on their ability to reasonably affect the entire planning area or portions of Douglas County and its communities. If a hazard has been excluded or removed, justification has been given.

To properly and accurately depict each hazard's risk, Two Rivers Emergency Management employed various methodologies appropriately tailored by hazard application. Generally, each hazard profile; describes the type, location, and extent the hazard; includes information on previous occurrences of hazard events and estimates on future occurrence; describes a hazard's estimated impact; assesses each participating entity's vulnerability to a hazard; and analyzes how changes in development have affected an area since the development of Douglas County's last hazard mitigation plan.

Each hazard profile conforms to FEMA's requirements as set forth in its Local Mitigation Plan Review Guide, Elements B1 through B3, and B4 and D1 where applicable.

## 3.1 – Methodology

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The natural characteristics of each hazard dictate that not one single approach works to accurately depict risk. In general, the hazard profiled in this plan can be categorized as either area-wide hazards or those with discretely identified hazard areas.

### *Area-Wide Hazards*

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Area-wide hazards indiscriminately impact the entire planning. Since it is beyond scientific measurement where an area-wide hazard, such as winter storms, will impact, and likely it will impact everywhere, it is reasonable to assume any significant growth and development will increase vulnerability and risk. Additionally, a hazard such as a tornado, will impact a specific path, but we are unable to predict where exactly it will begin. Thus, having any increase in growth or development increases the chance that a tornado will strike a developed segment of a jurisdiction. For this plan, this is relevant for droughts, flash flooding, tornadoes, severe storms, and winter storms.

### *Hazards with Identified Hazard Areas*

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If a jurisdiction grows or develops into an established dam spillway, floodplain, WUI zone, or an area with greater linear extensibility, that jurisdiction's vulnerability and risk increase by an amount equal to

the development or growth that now exists in that identified hazard area. For this plan, this is relevant for dam failure, earthquakes, landslides, riverine flooding, and wildfires.

### 3.2 – Hazard Selection

Appropriately identifying and selecting which natural hazards will be assessed is the first step in developing a risk assessment. The State of Washington’s Emergency Management Division profiles 10 natural hazards in its statewide hazard mitigation plan. Of those hazards, this plan profiles eight natural and one human-caused hazard.

Douglas County has been designated as an affected area by federal declaration twelve times. These declarations show a broad picture of the which hazards pose the greatest threat to the planning area. The table below lists each federal disaster declaration, the hazards which caused the impact, and the dates of the events:

**Table 3.1 – Disaster Declarations**

| Designation | Declaration | Hazards                 | Start Date | End Date   |
|-------------|-------------|-------------------------|------------|------------|
| DR-334      | 06/10/1972  | Flooding, Severe Storms | 06/10/1972 | 06/10/1972 |
| EM-3037     | 03/31/1977  | Drought                 | -          | -          |
| DR-623      | 05/21/1980  | MT. ST. Helens          | -          | -          |
| DR-822      | 04/14/1989  | Flooding                | 03/08/1989 | 03/17/1989 |
| DR-1159     | 01/17/1997  | Flooding, Winter Storms | 12/23/1996 | 02/10/1997 |
| DR-1361     | 03/01/2001  | Earthquake              | 02/28/2001 | 03/16/2001 |
| FM-2527     | 07/06/2004  | Wildfire                | 07/05/2004 | 07/06/2004 |
| FM-2784     | 07/11/2008  | Wildfire                | 07/10/2008 | 07/18/2008 |
| FM-5013     | 09/09/2012  | Wildfire                | 09/09/2012 | 09/15/2012 |
| EM-3372     | 08/21/2015  | Wildfire                | 08/13/2015 | 09/10/2015 |
| FM-5261     | 07/28/2018  | Wildfire                | 07/27/2018 | 08/01/2018 |
| FM-5271     | 08/12/2018  | Wildfire                | 08/11/2018 | 08/15/2018 |

*\*The data are from the Federal Emergency Management Agency*

Selecting only hazards that pose a reasonable risk to the planning area allows the mitigation strategy found in Section 4 to focus Douglas County’s capabilities and resources where they are needed most and can be the most effective. We found those hazards to be: Dam Failure, Droughts, Earthquakes, Flooding, Landslides, Tornadoes, Wildfires, Winter Storms

### 3.2 – Hazard Selection

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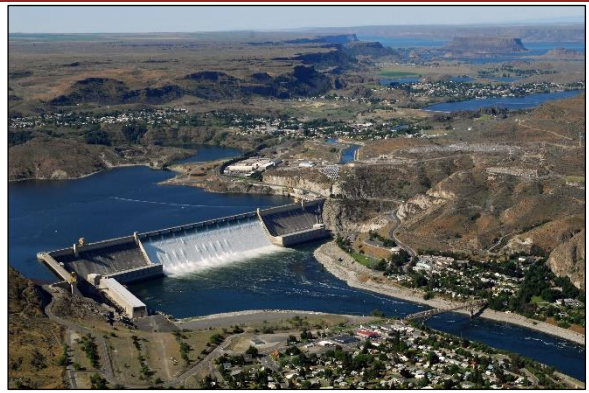
The table below lists all of the natural hazards included in the statewide plan, whether they are included in this plan, and if excluded, a summary justification of why it has been excluded. A lengthier justification for exclusion can be found later in this section, 3.12 – Excluded Hazards. In addition to hazards that are profiled in the state’s plan, this plan also includes dam failures, tornadoes, and winter storms.

**Table 3.2 – State Hazard Inclusion**

| <b>Hazard</b>   | <b>Determination</b> | <b>Summary Justification</b>      |
|-----------------|----------------------|-----------------------------------|
| Avalanche       | Excluded             | No reasonable risk                |
| Coastal Hazards | Excluded             | No reasonable risk                |
| Drought         | Included             | Disaster History                  |
| Earthquakes     | Included             | Risk Identified                   |
| Flooding        | Included             | Disaster History, Risk Identified |
| Landslide       | Included             | Risk Identified                   |
| Severe Storms   | Included             | Disaster History                  |
| Tsunami         | Excluded             | No reasonable risk                |
| Volcanoes       | Excluded             | No reasonable risk                |
| Wildfires       | Included             | Disaster History, Risk Identified |

### 3.3 – Dam Failures

A dam is a barrier across flowing water that obstructs, directs or slows down the flow, often creating a reservoir, lake or impoundments. Most dams have a section called a spillway or weir, over or through, which water flows, either intermittently or continuously.



Dams fail in two ways, a controlled spillway release done to prevent full failure, or the partial or complete collapse the dam itself. In each instance an overwhelming amount of water, and potentially debris, is released. Dam failures are rare, but when they occur can cause loss of life, and immense damage to infrastructure and the environment.

Common reasons for dam failure are the following:

- Sub-standard construction materials/techniques
- Spillway design error
- Geological instability caused by changes to water levels during filling or poor surveying
- Sliding of a mountain into the reservoir
- Poor maintenance, especially of outlet pipes
- Human, computer or design error
- Internal erosion, especially in earthen dams.
- Earthquakes

Dams are located throughout Douglas County and the surrounding counties. See the maps on the following pages for their location. In Douglas County, the potential hazard area for dam failure is generally the areas surrounding and downstream of the dam. The planning area contains five USACE rated high-hazard dams.

#### Location & Extent

Response to a dam or levee failure would be extensive and require wide ranging recovery efforts for reconstruction of the original flood control structures and any damaged property. The planning area contains 5 dams that are classified as “high hazard” by the USACE. The State of Washington Department of Ecology further breaks down the USACE’s classifications to give more detailed hazard information.

Table 3.3 – State of Washington Downstream Hazard Category

| WA Hazard Category | USACE Hazard Category |                                |
|--------------------|-----------------------|--------------------------------|
| 1A                 | High                  | Greater than 300 Lives at Risk |
| 1B                 | High                  | From 31 to 300 Lives at Risk   |
| 1C                 | High                  | From 7 to 30 Lives at Risk     |
| 2*                 | Significant           | From 1 to 6 Lives at Risk      |
| 2D                 | Significant           | From 1 to 6 Lives at Risk      |
| 2E**               | Significant           | No Lives at Risk**             |
| 3                  | Low                   | No Lives at Risk               |

\*Legacy classification, parsing all 2’s into 2D’s and 2E’s

\*\*Significant economic or environmental risk

\*\*\*The classification is from the State of Washington’s Department of Ecology

### 3.3 – Dam Failures

The location of the planning area’s high-hazard dams are depicted in the maps at the end of this sub section. They are all located on the county’s borders along the Columbia River. In the event one of these dams fails, water will likely inundate downstream towards lower elevation areas.

The dams in Douglas County are low risk to fail, but if they did, would likely only result in quick flooding down river and also add pressure to series of dams down river. There is usually little to no warning in the event of a dam or levee break. If a larger dam or a dam that is far upstream, there would likely be an impact in under 5 minutes. The table below lists the 5 high hazard dams in the planning area long with their State of Washington Department of Ecology hazard category and the estimated total water volume discharge.

**Table 3.4 – High Hazard Dams**

| Dam              | WA Hazard Category | Water Volume Discharge (acre-feet) |
|------------------|--------------------|------------------------------------|
| Chief Joseph Dam | 1A                 | 516,000                            |
| Grand Coulee Dam | 1A                 | 9,562,000                          |
| Rock Island Dam  | 1A                 | 130,000                            |
| Rocky Reach Dam  | 1B                 | 382,000                            |
| Wells Dam        | 1A                 | 300,000                            |

*\*The data are from the State of Washington Department of Ecology’s 2018 Inventory of Dams Report*

The vulnerability assessment found later in this subsection may not match the estimated extent and impacts show here since their hazard category denotes extent and impacts outside of Douglas County and thus the planning area.

### **History & Probability**

There have been no failures of high hazard dams in Douglas County.

The Chief Joseph Dam is inspected every 5 years while the other 4 dams in the planning area are inspected yearly. The inspection schedule below shows that this schedule is typically met and it is likely that any major structural problems would be uncovered during these inspections. Although the table shows the last inspection dates in 2017, it is likely that the NID doesn’t have the most up-to-date information from 2018 or 2019.

**Table 3.5 – Dam Inspection History**

| Dam              | Inspection Date |
|------------------|-----------------|
| Chief Joseph Dam | 06/28/2017      |
| Grand Coulee Dam | 08/19/2014      |
| Rock Island Dam  | 08/16/2017      |
| Rocky Reach Dam  | 08/16/2017      |
| Wells Dam        | 07/19/2017      |

*\*The data are from the USACE National Inventory of Dams.*

### 3.3 – Dam Failures

Given the absence of any historical precedence of dam failure in Douglas County, a history having reoccurring structural flaws, or any indication that the dams and levees are being poorly maintained, the probability of experiencing a dam or levee failure event is categorized as ‘rare.’

#### ***Vulnerability of and Impact on Facilities***

Facilities within a dam failure inundation area are at extreme risk. The water level of a dam failure can range from inches, causing damage similar to small floods, to completely engulfing a structure in water. Additionally, the speed of the flow can cause variations in the impact. A slow flow will cause damage similar to a riverine flood, however, a fast moving, high level flow has the potential to completely destroy a structure. See the table below for a breakdown of the planning area’s structural vulnerability and impact from each high-hazard dam.

**Table 3.6 – Vulnerability & Impact of Structures, Dam & Levee Failures**

| Dam              | Count | SD Sites | CFs | Value           |
|------------------|-------|----------|-----|-----------------|
| Chief Joseph Dam | 436   | 0        | 3   | \$68,663,313    |
| Grand Coulee Dam | 106   | 0        | 0   | \$21,368,000    |
| Rock Island Dam  | 74    | 0        | 0   | \$10,302,000    |
| Rocky Reach Dam  | 3,895 | 4        | 7   | \$1,011,379,400 |
| Wells Dam        | 690   | 0        | 0   | \$135,296,000   |
| Total =          | 5,202 | 4        | 10  | \$1,247,008,713 |

#### ***Vulnerability of and Impact on Critical Facilities***

Only a failure of the Rocky Reach and Chief Joseph Dams threaten any of the planning area’s critical facilities. The table below lists out the 5 critical facilities that would be affected by a failure of these dams.

**Table 3.7 – Vulnerability & Impact of Critical Facilities**

| Name                                  | Type             | Owner       | Location       |
|---------------------------------------|------------------|-------------|----------------|
| Bridgeport City Hall                  | Local Government | Bridgeport  | Bridgeport     |
| Bridgeport Fire Station               | Fire Prevention  | Bridgeport  | Bridgeport     |
| Bridgeport Water Treatment Facility   | Water Treatment  | Bridgeport  | Bridgeport     |
| Douglas County Sewage Treatment Plant | Water Treatment  | Douglas Co. | East Wenatchee |
| Douglas County Sheriff’s Office       | Law Enforcement  | Douglas Co. | East Wenatchee |

#### ***Vulnerability of and Impact on Population***

Populations within a dam failure inundation area are at extreme risk. Depending on the speed of the water’s arrival, a community’s population may not have time to evacuate. Additionally, evacuation routes can be blocked by the dam waters. If flood waters arrive quickly, many people can die. Depending on the elevation of the water, a community’s population may not have any available shelter to avoid the waters. See the table below for a breakdown of the planning area’s population vulnerability and impact from each high-hazard dam and levee.

**Table 3.8 – Vulnerability & Impact of Populations, Dam Failures**

| Dam or Levee     | Population | Housing Units | Students |
|------------------|------------|---------------|----------|
| Chief Joseph Dam | 1,605      | 497           | 0        |
| Grand Coulee Dam | 194        | 99            | 0        |
| Rock Island Dam  | 124        | 77            | 0        |
| Rocky Reach Dam  | 10,762     | 4,357         | 454      |
| Wells Dam        | 704        | 674           | 0        |
| Total =          | 13,389     | 5,704         | 454      |

**Vulnerability of and Impact on Systems**

A failure from any of the dams will have a significant impact on the on the planning area’s tourism, educational, economic, and transportation systems with the exception of the Rock Island Dam. Any large-scale dam failure would likely take down the affected area’s electrical infrastructure, but only in a minor way as none of the PUD’s major utility substations are within in identified dam failure areas.

Failure of the Grand Coulee, Chief Joseph, Rocky Reach, or Wells Dams would likely impact a large enough or geographically dense enough area where the indirect impacts would affect the entire planning area in terms of economic impact. Additionally, any of these dams threaten major transportation routes in and out of the county. The economic impact of losing the use of these roadways would have a financially region-wide impact.

**Key Considerations**

Population growth since the development of Douglas County’s last plan has led to significant increases in the planning area’s vulnerability. Specifically, unincorporated Douglas County, Bridgeport, and East Wenatchee’s growth has mostly occurred in areas with a high likelihood of inundation by dam failure.

**Table 3.9 – Vulnerability & Impact, Chief Joseph Dam**

| Asset                   | Count | Value        |
|-------------------------|-------|--------------|
| Population              | 1,605 | -            |
| Housing Units           | 497   | -            |
| SD Students             | 0     | -            |
| SD Sites                | 0     | \$0          |
| Agriculture             | 1     | \$1,729,983  |
| Commercial              | 13    | \$6,521,268  |
| Government              | 1     | \$202,664    |
| Industrial              | 2     | \$575,994    |
| Residential             | 412   | \$48,976,177 |
| Multi-Unit Residential* | 7     | \$10,657,227 |
| Total =                 | 436   | \$68,663,313 |

\*Multi-Unit Residential is defined as a structure with 5 or more residential units

\*\*The data are from the U.S. Census Bureau and FEMA

Table 3.10 – Vulnerability & Impact, Grand Coulee Dam

| Asset                   | Count | Value        |
|-------------------------|-------|--------------|
| Population              | 194   | -            |
| Housing Units           | 99    | -            |
| SD Students             | 0     | -            |
| SD Sites                | 0     | \$0          |
| Agriculture             | 0     | \$2,000      |
| Commercial              | 7     | \$4,398,000  |
| Government              | 1     | \$755,000    |
| Industrial              | 0     | \$0          |
| Residential             | 96    | \$15,450,000 |
| Multi-Unit Residential* | 2     | \$763,000    |
| Total =                 | 106   | \$21,368,000 |

\*Multi-Unit Residential is defined as a structure with 5 or more residential units

\*\*The data are from the U.S. Census Bureau and FEMA

Table 3.11 – Vulnerability & Impact, Rock Island Dam

| Asset                   | Count | Value        |
|-------------------------|-------|--------------|
| Population              | 124   | -            |
| Housing Units           | 77    | -            |
| SD Students             | 0     | -            |
| SD Sites                | 0     | \$0          |
| Agriculture             | 3     | \$1,054,000  |
| Commercial              | 1     | \$119,000    |
| Government              | 0     | \$0          |
| Industrial              | 0     | \$0          |
| Residential             | 71    | \$9,129,000  |
| Multi-Unit Residential* | 0     | \$0          |
| Total =                 | 75    | \$10,302,000 |

\*Multi-Unit Residential is defined as a structure with 5 or more residential units

\*\*The data are from the U.S. Census Bureau and FEMA

Table 3.12 – Vulnerability & Impact, Rocky Reach Dam

| Asset                   | Count | Value        |
|-------------------------|-------|--------------|
| Population              | 825   | -            |
| Housing Units           | 373   | -            |
| SD Students             | 0     | -            |
| SD Sites                | 0     | \$0          |
| Agriculture             | 9     | \$4,032,000  |
| Commercial              | 10    | \$5,948,000  |
| Government              | 1     | \$482,000    |
| Industrial              | 4     | \$1,656,000  |
| Residential             | 362   | \$54,133,000 |
| Multi-Unit Residential* | 0     | \$0          |
| Total =                 | 386   | \$66,251,000 |

\*Multi-Unit Residential is defined as a structure with 5 or more residential units

\*\*The data are from the U.S. Census Bureau and FEMA

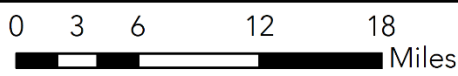
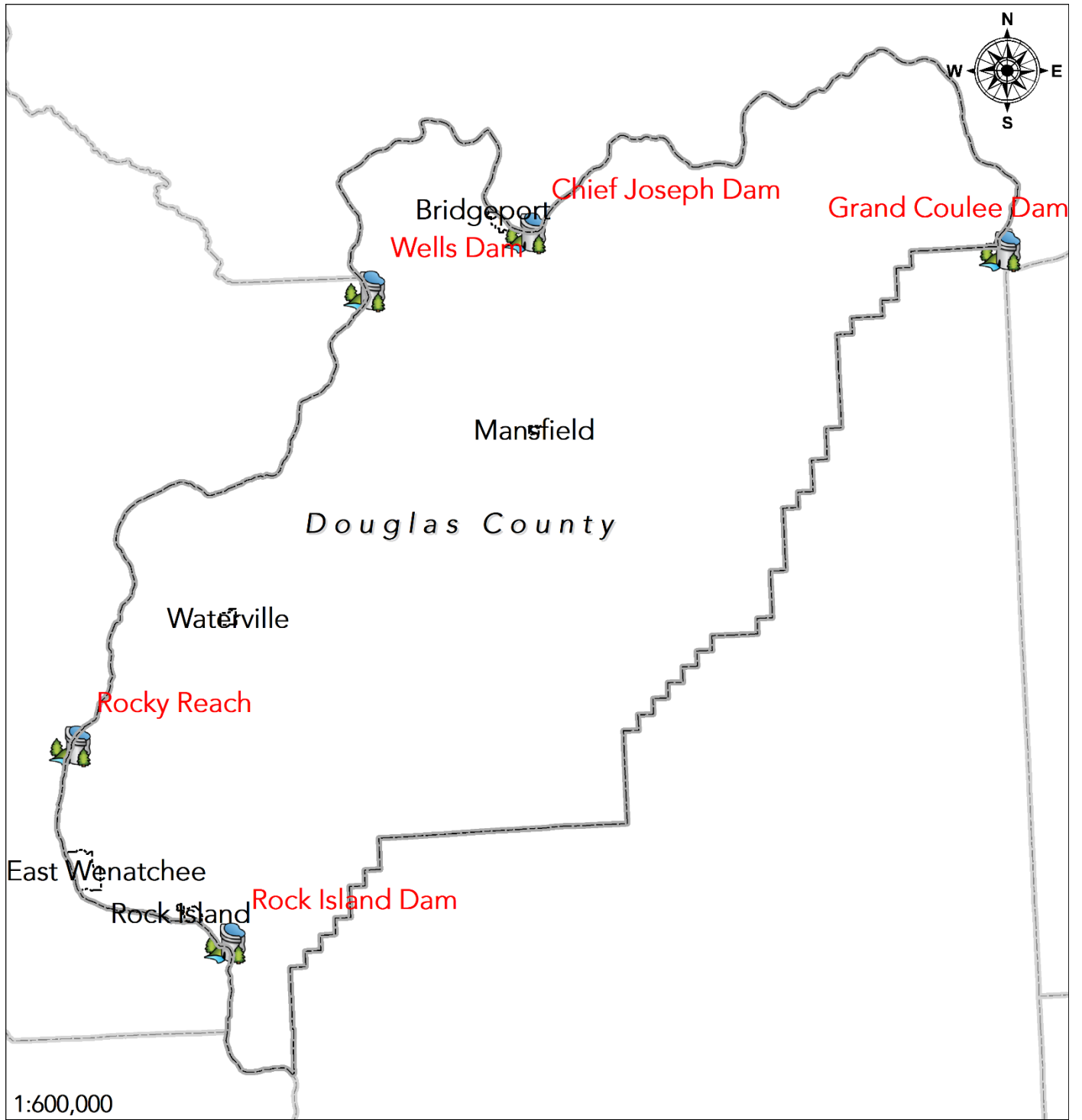
Table 3.13 – Vulnerability & Impact, Wells Dam



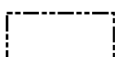
| Asset                   | Count | Value         |
|-------------------------|-------|---------------|
| Population              | 674   | -             |
| Housing Units           | 704   | -             |
| SD Students             | 0     | -             |
| SD Sites                | 0     | \$0           |
| Agriculture             | 7     | \$9,525,000   |
| Commercial              | 14    | \$5,477,000   |
| Government              | 0     | \$148,000     |
| Industrial              | 4     | \$683,000     |
| Residential             | 661   | \$114,670,000 |
| Multi-Unit Residential* | 4     | \$4,793,000   |
| Total =                 | 690   | \$135,296,000 |

\*Multi-Unit Residential is defined as a structure with 5 or more residential units

\*\*The data are from the U.S. Census Bureau and FEMA

Map 3.1 – High Hazard Dams, Douglas County



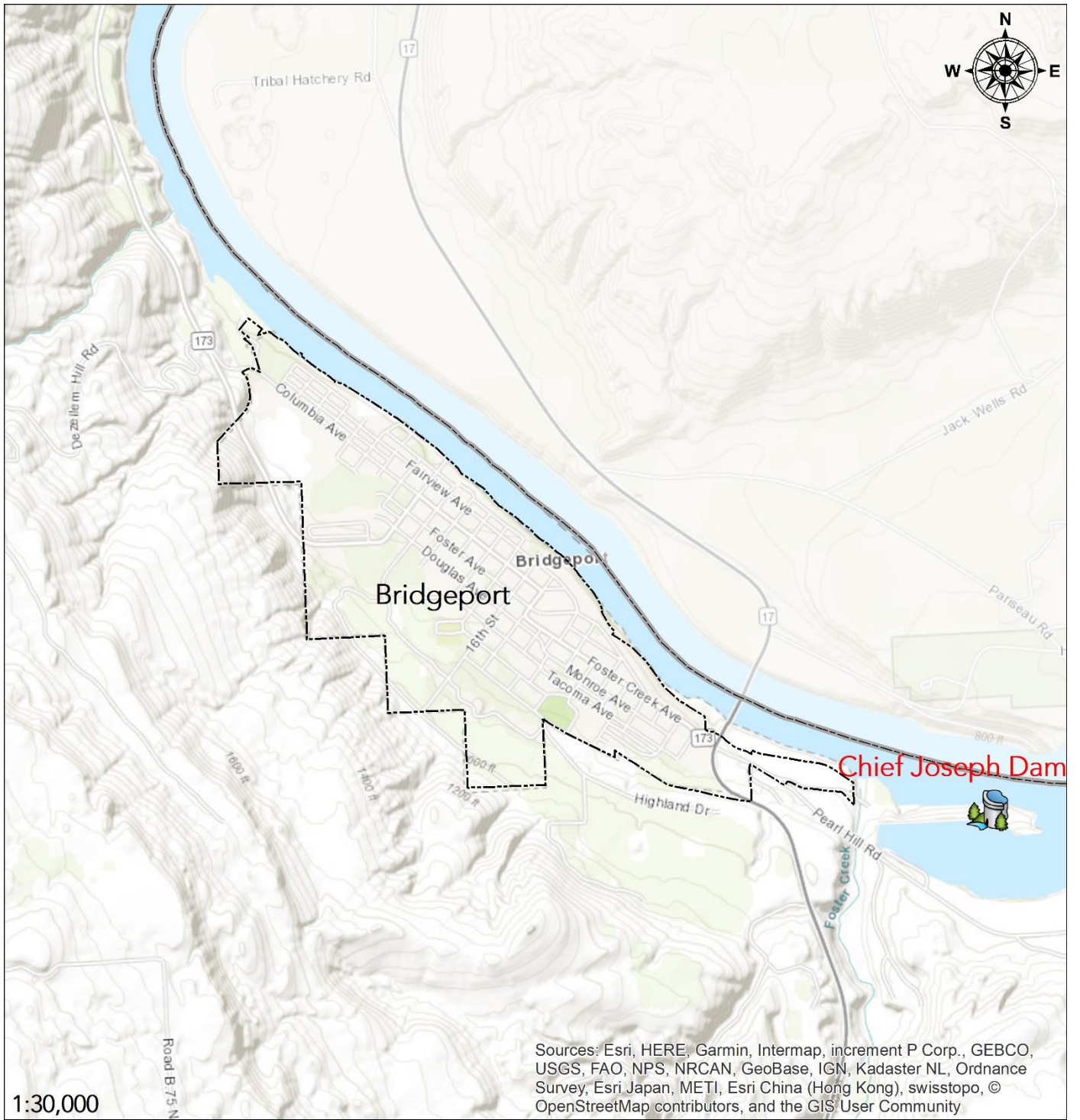
-  State Borders
-  County Borders
-  Municipal Borders

 High Hazard Dams



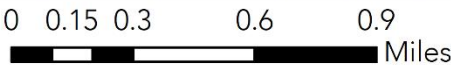
Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

Map 3.2 – Chief Joseph Dam



1:30,000

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community



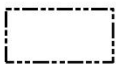
State Borders



High Hazard Dams



County Borders

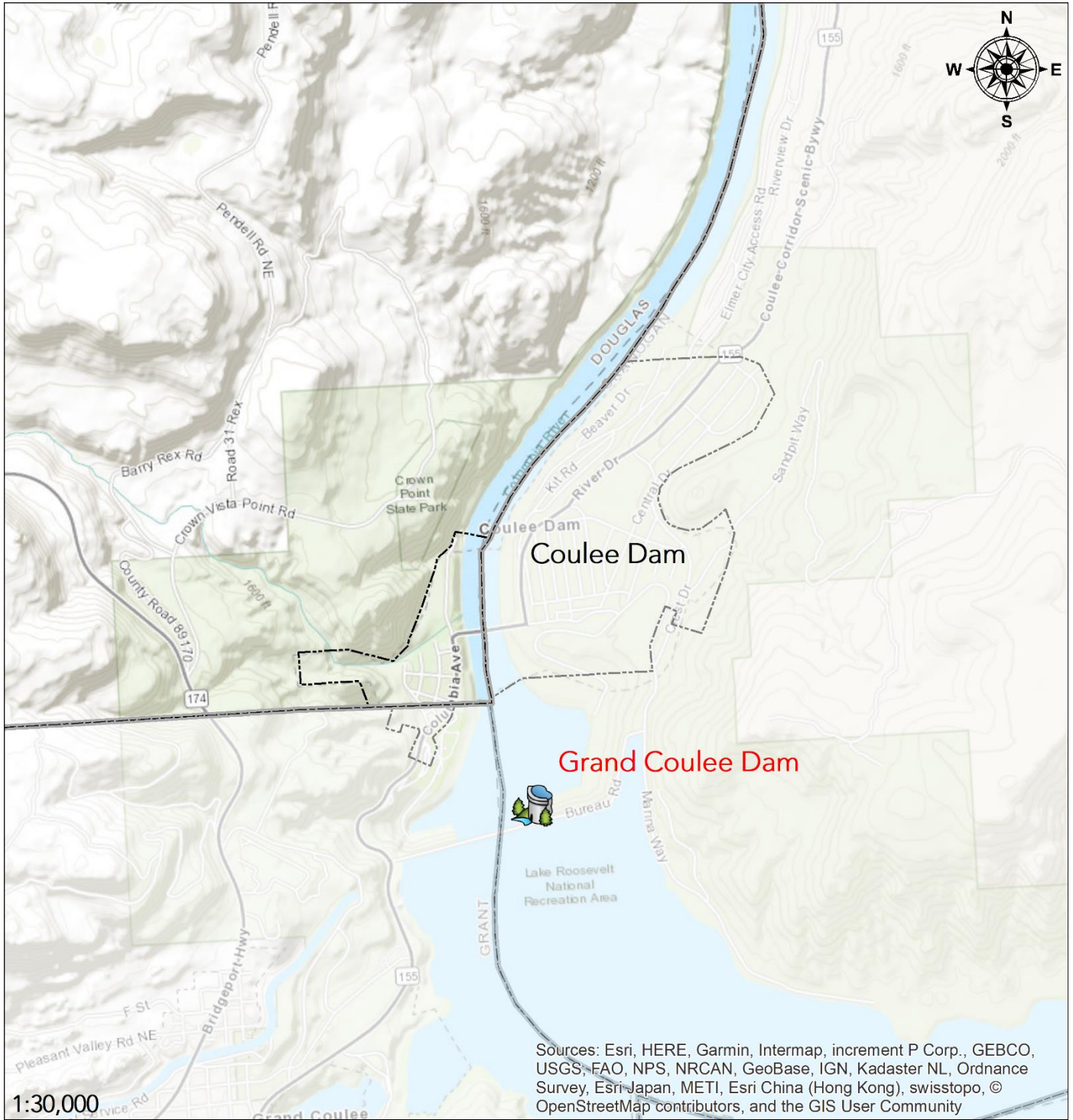


Municipal Borders



Data Sources: ESRI, FEMA, Silvis Labs, U.S. Census Bureau, USDA, USGS

Map 3.3 – Grand Coulee Dam



0 0.15 0.3 0.6 0.9 Miles

 Data Sources: ESRI, FEMA, Silvis Labs, U.S. Census Bureau, USDA, USGS

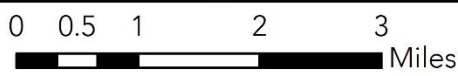
 State Borders

 County Borders

 Municipal Borders

 High Hazard Dams

Map 3.4 – Rock Island Dam



-  State Borders
-  County Borders
-  Municipal Borders

 High Hazard Dams



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

Map 3.5 – Rocky Reach Dam



1:100,000

0 0.5 1 2 3 Miles

High Hazard Dams

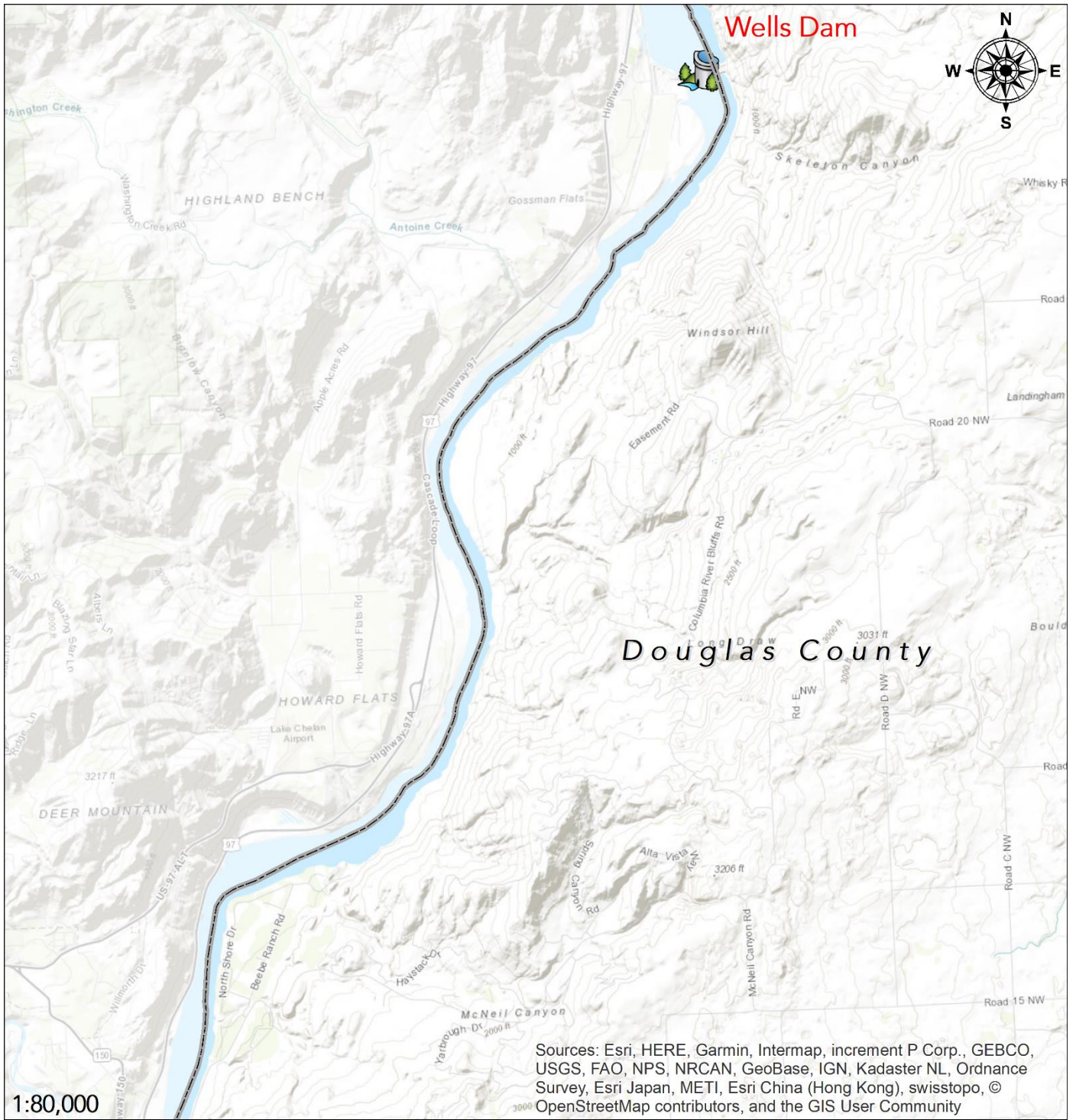
State Borders

County Borders

Municipal Borders

Data Sources: ESRI, FEMA, Silvis Labs, U.S. Census Bureau, USDA, USGS

Map 3.6 – Wells Dam



0 0.425 0.85 1.7 2.55 Miles

 Data Sources: ESRI, FEMA, Silvis Labs, U.S. Census Bureau, USDA, USGS

 State Borders

 County Borders

 Municipal Borders

 High Hazard Dams

## 3.4 – Droughts

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Drought is an abnormally dry period lasting months or years when an area has a deficiency of water and precipitation in its surface and or underground water supply. The hydrological imbalance can be grouped into the following non-exclusive categories.

*Agricultural:* When the amount of moisture in the soil no longer meets the needs of previously grown crops.

*Hydrological:* When surface and subsurface water levels are significantly below their normal levels.

*Meteorological:* When there is a significant departure from the normal levels of precipitation.

*Socio-Economic:* When the water deficiency begins to significantly affect the population.



Droughts are regularly monitored by multiple federal agencies using a number of different indices. Typically, they are seasonal occurring in the late spring through early fall. Drought monitoring focuses on precipitation and temperature. When precipitation is less than normal, and natural water supplied begins to decrease, a drought is occurring.

When below average, little or no rain falls soil can dry out and plants can die. If unusually dry weather persists and water supply problems develop the time period is defined as a drought. Human activity such as over farming, excessive irrigation, deforestation, and poor erosion controls can exacerbate a drought's effects. It can take weeks or months before the effects of below average precipitation on bodies of water are observed. Depending on the region droughts can happen quicker, noticed sooner, or have their effects naturally mitigated. The more humid and wet an area is, the quicker the effects will be realized. A naturally dry region, which typically relies more on subsurface water will take more time to actualize its effects.

Periods of drought can have significant environment, agricultural, health, economic, and social consequences. The effects vary depending on vulnerability and regional characteristics. Droughts can also reduce water quality through a decreased ability for natural rivers and streams to dilute pollutants and increase contamination. See the list below for the most common effects of droughts.

- Diminished crop growth or yield
- Erosion
- Dust storms
- Ecosystem and environmental damage
- Increased probability of wildfires
- Reduced electricity production due to reduced flow through hydroelectric dams
- Shortages of water for industrial production

### ***Location & Extent***

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Drought is part of normal climate fluctuations in the United States. According to Douglas County's drought history, most drought events affect the state for at least two to three months at a time. It should be noted, though, that climatic variability can cause dry conditions for up to years at a time.

### 3.4 - Droughts

Droughts occur over large geographic areas. It is extremely likely that if any part of the planning area is experiencing a drought that the whole planning area will also be experiencing drought conditions.

Historically, droughts have been measured by a number of indices, most notably the Palmer Drought Severity Index. However, NOAA currently uses an updated drought severity classification, the Drought Monitor Scale, shown below. Given the complex nature and unpredictability of droughts, the planning area can be affected by a drought ranging from D0 to D4 on the Drought Monitor Scale. Typically, the droughts that affect the planning area scale between D0 and D2.

**Table 3.14 – Drought Monitor Scale**

| Category | Description         | Possible Impacts  | Palmer Drought Index | CPC Soil Moisture Model (Percentiles) | USGS Weekly Streamflow (Percentiles) | Standardized Precipitation Index (SPI) | Objective Short and Long-term Drought Indicator Blends (Percentiles) |
|----------|---------------------|---|----------------------|---------------------------------------|--------------------------------------|--|--|
| D0       | Abnormally Dry      | Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered | -1.0 to -1.9         | 21-30                                 | 21-30                                | -0.5 to -0.7                           | 21-30  |
| D1       | Moderate Drought    | Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested                        | -2.0 to -2.9         | 11-20                                 | 11-20                                | -0.8 to -1.2                           | 11-20  |
| D2       | Severe Drought      | Crop or pasture losses likely; water shortages common; water restrictions imposed   | -3.0 to -3.9         | 6-10                                  | 6-10                                 | -1.3 to -1.5                           | 6-10   |
| D3       | Extreme Drought     | Major crop/pasture losses; widespread water shortages or restrictions   | -4.0 to -4.9         | 3-5                                   | 3-5                                  | -1.6 to -1.9                           | 3-5  |
| D4       | Exceptional Drought | Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies   | -5.0 or less         | 0-2                                   | 0-2                                  | -2.0 or less                           | 0-2  |

Drought warning is based on a complex interaction of many different variables, water uses, and consumer needs. Drought warning is directly related to the ability to predict conditions that produce drought, primarily precipitation and temperature. A drought is not official or declared until dry conditions have been met for a period of time, meaning that it is inherent that the planning area would be experiencing drought conditions prior to a drought being officially declared.

#### **History & Probability**

Since 2000, the planning area has experienced numerous, lengthy droughts. The USDA has recorded 585 total weeks of drought over the last 19 years. For a complete list of USDA recorded drought events, please reference Appendix D.

Given the historic precedent set by past droughts, it is highly likely that the planning area will experience season-long droughts in the future. As a rough estimate, the planning area should expect to see a two to three-month long drought every 3 out of 4 years.

### ***Vulnerability of and Impact on Facilities***

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Droughts do not have an impact on structures.

### ***Vulnerability of and Impact on Critical Facilities***

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Droughts do not have an impact on structures.

### ***Vulnerability of and Impact on Population***

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Droughts do not have a direct impact that threatens injury or death to the planning area's population.

### ***Vulnerability of and Impact on Systems***

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Drought's primary impact is on agriculture and livestock and thus can have significant effects on a jurisdiction's agricultural and tourist economies. If the precipitation level is below normal, farmers and ranchers will struggle to grow their crops and feed their livestock. If rivers, streams, and lakes dry up, tourists will be less likely to enjoy a jurisdiction's amenity resources. A drought would not have a reasonably significant direct impact on the Douglas County PUD's ability to provide power.

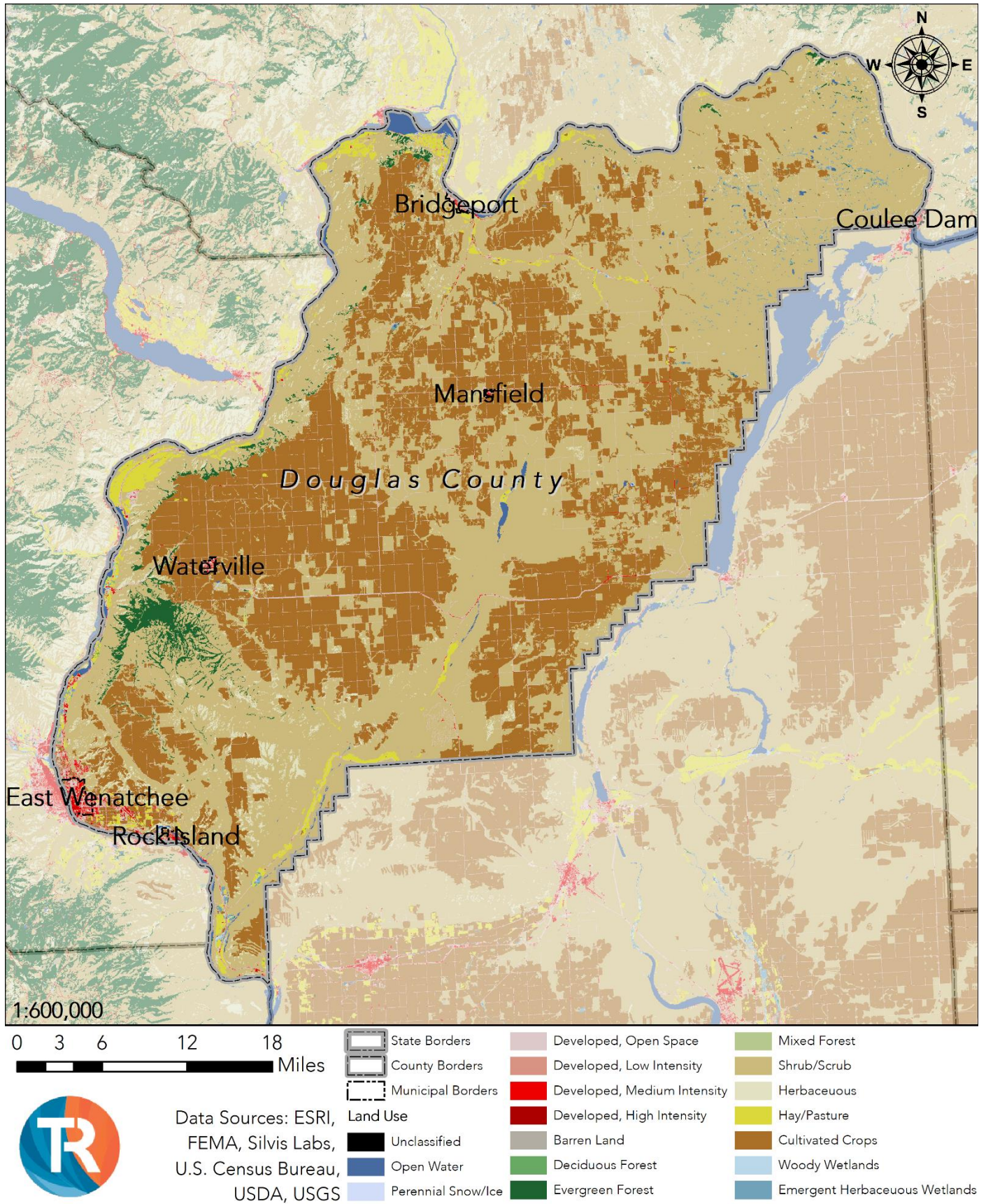
The planning area hosts 849 farms across 814,109 acres of land. The USDA estimates that the total value of products from these farms is \$199,041,000 per year. All of them are considered vulnerable to droughts. An estimate of the land engaged in agricultural activities can be found in the map at the end of this section.

### ***Key Considerations***

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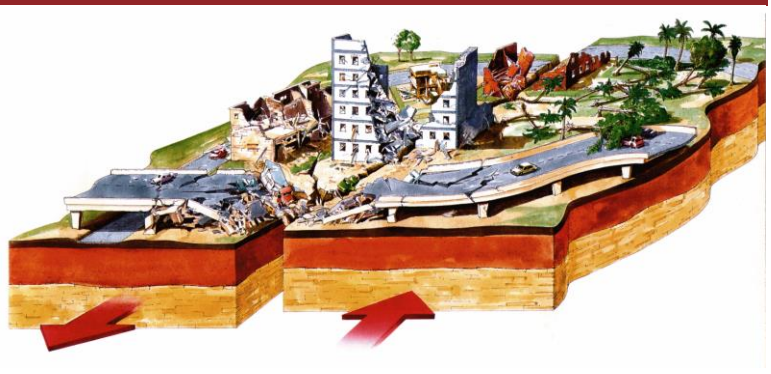
The entire planning area is at risk to droughts. Even though the direct impact of a drought will likely affect the county at large instead of the incorporated cities, a drought's effects would quickly spread to the interdependent economies of the cities throughout Douglas County. Additionally, although population growth would place various communities at a higher vulnerability to droughts, the usage of water by the population pales in comparison to the amount used by agricultural activities and is largely negated. Considering the most direct, agricultural risk, the communities most at risk are those that have greater portions of agricultural land. Those communities are unincorporated Douglas County along with the municipalities of Mansfield and Waterville.

Map 3.7 – Land Use, Douglas County



## 3.5 – Earthquakes

An earthquake is the result of a sudden release of energy in the Earth's crust that creates seismic waves. In the most general sense, the word earthquake is used to describe any event that generates seismic waves. Earthquakes are typically caused by the rupturing of geological faults. Occasionally, they are also caused by other events such as volcanic activity, landslides, mine blasts, tsunamis, and nuclear tests. An earthquake's point of initial rupture is called its focus or hypocenter. The epicenter is the point at ground level directly above the hypocenter.



At the Earth's surface, earthquakes manifest themselves by shaking and sometimes displacement of the ground. When the epicenter of a large earthquake is located offshore, the seabed may be displaced sufficiently to cause a tsunami. Earthquakes can also trigger landslides, and occasionally volcanic activity. The shallower an earthquake, the more damage to structures it causes, all else being equal.

An earthquake's effect can be compounded by the soil type underlying a community's buildings and infrastructure. If the soil is not composed of bedrock and consists of clays, silts, and other types of sand, the pressure generated by an earthquake can force brittle soil and water up towards the surface. These upward forced materials will then destabilize buildings and infrastructure, causing damage anywhere from cracks in roadways to the full displacement and destruction of a building. Smaller upward forced materials can destabilize slopes and building foundations further compounding the potential damage to a community.

### *Location & Extent*

The State of Washington and Douglas County lies east of the Cascadia subduction zone where the North American Plate collides with a number of smaller plates, the Juan De Fuca plate being the largest.

Earthquakes from the Cascadia subduction zone can strike suddenly and without warning, occur at any time of the year, and at any time of the day. There is not definitive way of predicting an earthquake. The duration of shaking can last anywhere from a second to a period of minutes.

There are numerous characteristics measured when observing earthquake activity, however: its force, depth, peak ground acceleration, and the distance to the epicenter are the most influential factors in determining damage. Two scales are used when referring to earthquake activity; estimating the total force of the earthquake, the Richter Scale, and the observed damage from an earthquake, the Modified Mercalli Intensity Scale. Please see the figures on the following pages for both scales and their estimated matching equivalent index.

**THE CASCADIA SUBDUCTION ZONE IN CROSS-SECTION:**

New crust forms at spreading ridges between the Pacific Plate and the Juan de Fuca, Gorda, and Explorer plates. As these three plates are pushed eastward, they are forced to subduct beneath the North American Plate. Strain builds up where they have become stuck (locked) and will be released one day in a great earthquake.

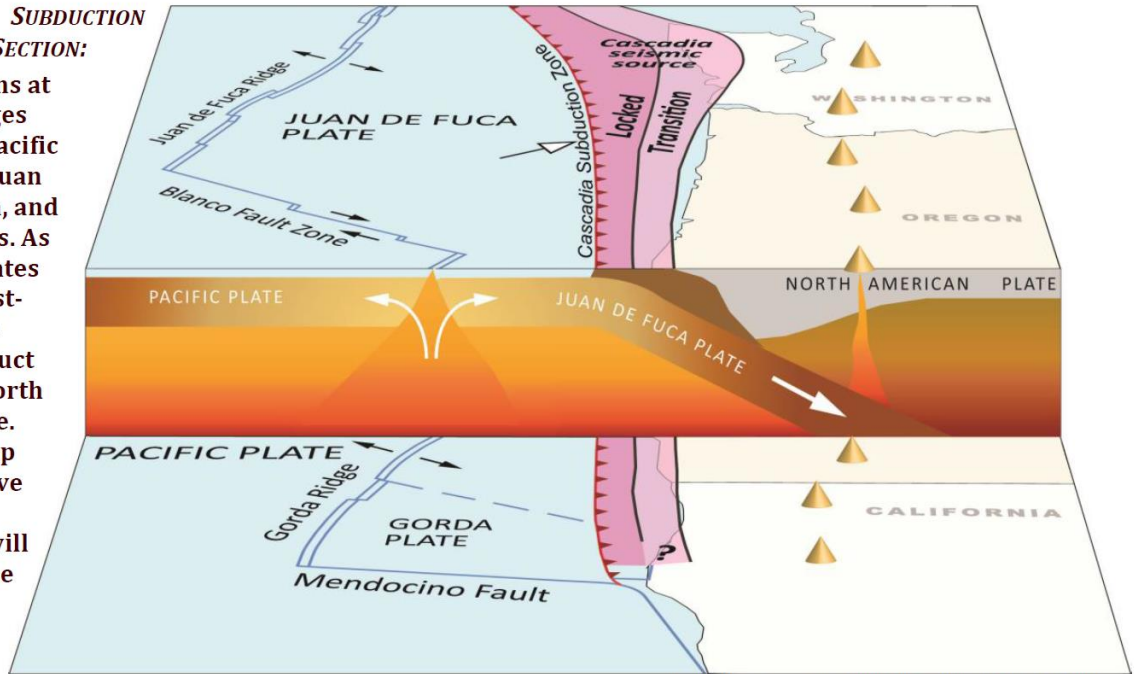


Image Source: Oregon Department of Geology and Mineral Industries

Earthquakes of magnitude 5.0 or greater are considered potentially threatening to Douglas County and its jurisdictions, as this is the point at which structures can become unusable due to structural and foundation damage. Any earthquake felt at this magnitude or greater would likely be cause for cessation of operations until sight inspections can take place. Although there are numerous small magnitude earthquakes, less than 4.5 magnitude in and around Douglas County, they are so deep in the Earth and of such a low magnitude, that they do not pose a reasonable threat.

However, the entire planning area is at risk from the Cascadia subduction zone. Map 3.8 depicts the USGS’s potential peak ground acceleration values in the event of a catastrophic earthquake. In the event of a catastrophic earthquake from the Cascadia subduction zone, the western half of Douglas County would experience 9-10% and 8-9% peak ground acceleration, equivalent 5 to 5.5 on the Richter Scale and similarly VI to VII on the Mercalli Scale.

Table 3.15 – Modified Mercalli Scale Vs. Richter Scale

| Category             | Effects  | Richter Scale (approximate) |
|----------------------|--|-----------------------------|
| I. Instrumental      | Not felt   | 1-2                         |
| II. Just perceptible | Felt by only a few people, especially on upper floors of tall buildings  | 3                           |
| III. Slight          | Felt by people lying down, seated on a hard surface, or in the upper stories of tall buildings   | 3.5                         |
| IV. Perceptible      | Felt indoors by many, by few outside; dishes and windows rattle  | 4                           |
| V. Rather strong     | Generally felt by everyone; sleeping people may be awakened  | 4.5                         |
| VI. Strong           | Trees sway, chandeliers swing, bells ring, some damage from falling objects  | 5                           |
| VII. Very strong     | General alarm; walls and plaster crack   | 5.5                         |
| VIII. Destructive    | Felt in moving vehicles; chimneys collapse; poorly constructed buildings seriously damaged   | 6                           |
| IX. Ruinous          | Some houses collapse; pipes break  | 6.5                         |
| X. Disastrous        | Obvious ground cracks; railroad tracks bent; some landslides on steep hillsides  | 7                           |
| XI. Very disastrous  | Few buildings survive; bridges damaged or destroyed; all services interrupted (electrical, water, sewage, railroad); severe landslides | 7.5                         |
| XII. Catastrophic    | Total destruction; objects thrown into the air; river courses and topography altered   | 8                           |

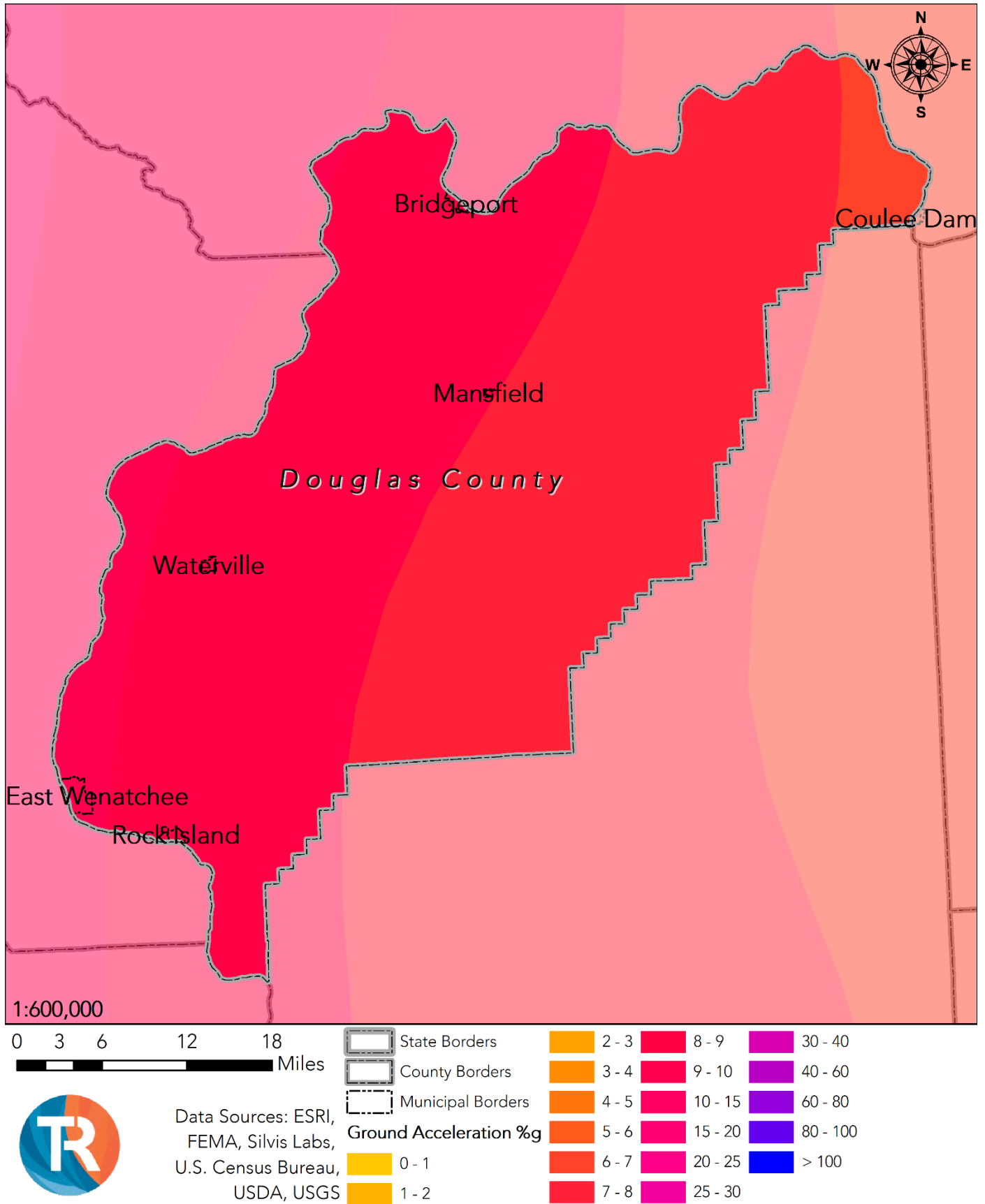
Table 3.16 – Peak Ground Acceleration Vs. Mercalli & Richter Scale

| Mercalli Scale Intensity | Richter Scale | Minimum %g | Maximum %g |
|--------------------------|---------------|------------|------------|
| I                        | 1 – 2         | 0.00%      | 0.17%      |
| II – III                 | 3 – 3.5       | 0.17%      | 1.40%      |
| IV                       | 4             | 1.40%      | 3.90%      |
| V                        | 4.5           | 3.90%      | 9.20%      |
| VI                       | 5             | 9.20%      | 18.00%     |
| VII                      | 5.5           | 18.00%     | 34.00%     |
| VIII                     | 6             | 34.00%     | 65.00%     |
| IX                       | 6.5           | 65.00%     | 124.00%    |
| X+                       | 7+            | 124.00%    | -          |

### History & Probability

Although minor earthquake activity occurs on a daily basis in the State of Washington, damaging earthquakes are infrequent. Significant earthquakes have occurred three times in recent history and only damaged western portions of the State of Washington, those being the Nisqually earthquake in 2001, the Seattle-Tacoma earthquake in 1965, and the Olympia earthquake in 1949.

Map 3.8 – Peak Ground Acceleration, Douglas County



### 3.5 – Earthquakes

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The estimated probability of occurrence for an earthquake similar to the magnitude 6.5 Seattle-Tacoma event is approximately once every 35 years. The probability of occurrence of an earthquake similar to the magnitude 7.1 Olympia earthquake is once every 110 years. The approximate occurrence rate for a magnitude 9 earthquake in the Cascadia Subduction Zone is once every 350 to 500 years.

Even in these recent historical cases, Douglas County and the planning area was only impacted at the equivalent of category IV on the Mercalli Scale: “Felt indoors by many, by few outside, dishes and windows rattle.” As to be expected from the level of intensity, no deaths, injuries, or property damage from these earthquakes was reported in the planning area. If an earthquake does significantly impact Douglas County, it would likely come from a catastrophic earthquake emanating from the Cascadia Subduction Zone or an unmeted, unpredictable earthquake emanating in a similar place to Nisqually and Seattle-Tacoma epicenters.

Considering the recurrence interval and history of earthquakes felt in Douglas County, the probability of occurrence of a damaging earthquake is “rare.”

#### ***Vulnerability of and Impact on Facilities***

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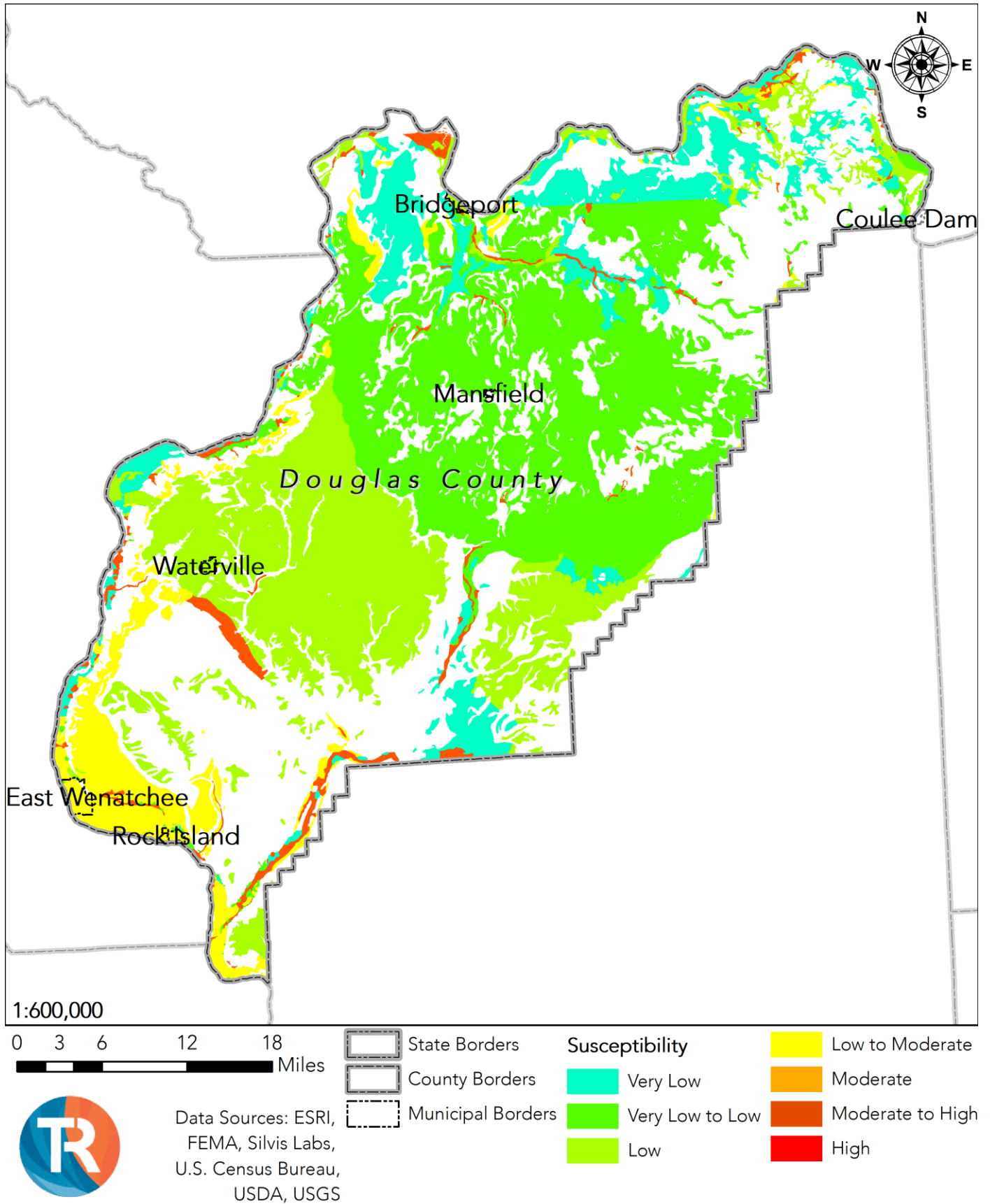
Douglas County and its jurisdictions’ structural vulnerability to earthquakes vary based on the construction quality, construction material, soil and foundation, and earthquake resilience of each structure. The State of Washington has been incredibly pro-active in updating, increasing, and enforcing its seismic resilient building codes. However, a high magnitude earthquake will still damage or destroy structures.

The planning area’s most vulnerable structures are those which are older, have not been subject to new and improved building codes, are built over unstable soil, and those susceptible to secondary hazards such as landslides. Most of the planning area is rated on the lower end of the liquefaction susceptibility scale as depicted in Map 3.9 on the following page.

Historically, the planning area has not sustained any property damage from earthquakes.

All \$202,710,700 of the Eastmont School District’s structures are located in 9-10% or 8-9% peak ground acceleration zones. The tables below detail the municipal structures located in the 9-10% and 8-9% peak ground acceleration zones.

Map 3.9 – Liquefaction Areas, Douglas County



**Table 3.17 – Vulnerable Municipal Structures by Count, Earthquakes**

| Municipality    | Ag         | Com        | Gov       | Ind        | Res           | Res-M      | Total         |
|-----------------|------------|------------|-----------|------------|---------------|------------|---------------|
| Uni-Douglas Co. | 150        | 227        | 7         | 85         | 7,980         | 31         | 8,480         |
| Bridgeport      | 2          | 20         | 2         | 3          | 618           | 11         | 656           |
| Coulee Dam      | 0          | 0          | 0         | 0          | 0             | 0          | 0             |
| East Wenatchee  | 27         | 267        | 10        | 64         | 3,905         | 80         | 4,353         |
| Mansfield       | 4          | 7          | 1         | 0          | 166           | 0          | 178           |
| Rock Island     | 3          | 12         | 1         | 2          | 310           | 1          | 329           |
| Waterville      | 6          | 23         | 5         | 5          | 451           | 4          | 494           |
| <b>Total =</b>  | <b>192</b> | <b>556</b> | <b>26</b> | <b>159</b> | <b>13,430</b> | <b>127</b> | <b>14,490</b> |

\*Multi-Unit Residential is defined as a structure with 5 or more residential units

\*\*The data are from the U.S. Census Bureau and FEMA

**Table 3.18 – Vulnerable Municipal Structures by Value, Earthquakes**

| Municipality    | Ag                   | Com                  | Gov                 | Ind                 | Res                    | Res-M                | Total                  |
|-----------------|----------------------|----------------------|---------------------|---------------------|------------------------|----------------------|------------------------|
| Uni-Douglas Co. | \$87,741,000         | \$100,592,000        | \$3,364,000         | \$23,480,000        | \$1,541,164,000        | \$61,781,000         | \$1,818,122,000        |
| Bridgeport      | \$2,595,000          | \$9,782,000          | \$304,000           | \$864,000           | \$73,465,000           | \$15,986,000         | \$102,996,000          |
| Coulee Dam      | \$0                  | \$0                  | \$0                 | \$0                 | \$0                    | \$0                  | \$0                    |
| East Wenatchee  | \$35,552,000         | \$180,270,000        | \$7,267,000         | \$17,094,000        | \$873,606,000          | \$125,260,000        | \$1,239,049,000        |
| Mansfield       | \$1,188,000          | \$2,264,000          | \$280,000           | \$77,000            | \$26,000,000           | \$0                  | \$29,809,000           |
| Rock Island     | \$1,434,000          | \$4,144,000          | \$451,000           | \$226,000           | \$40,146,000           | \$1,109,000          | \$47,510,000           |
| Waterville      | \$1,435,000          | \$10,376,000         | \$1,708,000         | \$1,566,000         | \$67,280,000           | \$5,299,000          | \$87,664,000           |
| <b>Total =</b>  | <b>\$129,945,000</b> | <b>\$307,428,000</b> | <b>\$13,374,000</b> | <b>\$43,307,000</b> | <b>\$2,621,661,000</b> | <b>\$209,435,000</b> | <b>\$3,325,150,000</b> |

\*Multi-Unit Residential is defined as a structure with 5 or more residential units

\*\*The data are from the U.S. Census Bureau and FEMA

### ***Vulnerability of and Impact on Critical Facilities***

Of the 50 identified critical facilities in the planning area, all are within the 9-10% or 8-9% peak ground acceleration zones with the exception of the Coulee Dam City Hall, Coulee Dam Sewage Lagoon, and the Grand Coulee Dam Power Switch Yard. These 47 critical facilities could be severely damaged or leveled if there was a catastrophic earthquake.

### ***Vulnerability of and Impact on Population***

Douglas County and the vulnerability of its jurisdictions' population to earthquakes is largely dependent on its vulnerability to facilities. An earthquake will shake objects off a wall or shake off parts of a structure which has the potential to hurt the population. Additionally, there is the risk of a facility partially or fully collapsing which would injure or kill the inhabitants. Any number of residents are vulnerable in relation to the structures in which they live, work, and visit. An estimate of the populations vulnerable to an earthquake are those residing in the 9-10% and 8-9% peak acceleration areas and are detailed in the table below.

Historically, there are no recorded incidents of death or injury from earthquakes in the planning area.

**Table 3.19 – Vulnerable Municipal Populations, Riverine Flooding**

| Municipality    | Population | Housing Units |
|-----------------|------------|---------------|
| Uni-Douglas Co. | 19,515     | 8,298         |
| Bridgeport      | 2,555      | 745           |
| Coulee Dam      | 0          | 0             |
| East Wenatchee  | 13,983     | 13,190        |
| Mansfield       | 339        | 320           |
| Rock Island     | 1,015      | 332           |
| Waterville      | 1,198      | 482           |
| Total =         | 38,605     | 23,367        |

*\*Multi-Unit Residential is defined as a structure with 5 or more residential units*

*\*\*The data are from the U.S. Census Bureau and FEMA*

### ***Vulnerability of and Impact on Systems***

If an earthquake damages any part of Douglas County or its jurisdictions, it is highly likely the entire planning area will be indirectly affected due to the geographic scale of earthquakes. A high magnitude event would likely significantly hurt the planning area, destroying buildings and infrastructure, starting fires, incurring widespread loss of power and basic services, and hampering local emergency management and response services from coordinating or providing the necessary assistance. Electrical services would also be significantly affected, although more so due to potential damage to the area’s dams, and less due to minor damage to the Douglas County PUD’s electrical transportation infrastructure.

If a high magnitude earthquake originates from the Cascadia Subduction Zone it is likely the entire region will be dramatically affected and emergency services from local, regional, state, and the federal government will be spread thin among the region. A high magnitude earthquake will not only yield these direct and immediate effects, but will likely hurt Douglas County and its jurisdictions’ economy and scar its population for years.

### ***Key Considerations***

The vast majority of the planning area’s population growth exists within the 9-10% and 8-9% peak acceleration areas. Therefore, the planning area has significantly increased its overall vulnerability and risk to earthquakes since the development of its last hazard mitigation plan.

Unincorporated Douglas County, Mansfield, and Waterville all retain significant levels of building stock constructed prior to the 1960s. These buildings were generally constructed to lower seismic resistant standards and codes and thus these jurisdictions are considered more vulnerable.

## 3.6 – Floods

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Flooding is the most prevalent and costly disaster in the United States. Flooding occurs when water, due to dam failures, rain, or melting snows, exceeds the absorptive capacity of the soil and the flow capacity of rivers, streams or coastal areas. At this point, the water concentration hyper extends the capacity of the flood way and the water enters the floodplain. Floods are most common in seasons of rain and thunderstorms.



Intense rainfall, accompanying the large thunderstorms in Douglas County and its participating jurisdictions, may result in water flowing rapidly from higher elevations, exceeding river flow capacity, collecting in agricultural areas, inadequate municipal stormwater drainage, or inadequate soil absorption capacity caused by urban and suburban development.

### *Location & Extent*

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Various types of floods can happen quickly, under an hour, in the form of a flash flood, or accumulate seasonally over a period of weeks as is the case in a riverine flood. Flooding can occur anytime throughout the year, but is typically associated with the spring season.

A variety of factors affect the severity of flash and riverine flooding within the planning area. These include topography, weather characteristics, development, and geology. Intense flooding will create havoc in any jurisdictions affected. The predicative magnitude of flash and riverine floods varies greatly.

Flash flooding is unpredictable and can occur anywhere throughout the planning area. Douglas County and its participating jurisdictions are generally equally likely to experience flash flooding in low-lying areas, poor drainage, or suburban sprawl. Historical documentation warns that the areas around Douglas Creek often experience flash flooding.

NOAA flash flood records indicate that Douglas County and its participating jurisdictions have seen up to 10 inches of accumulation in rural and some urban areas, however the general average is between 1 to 3 inches during notable flash floods. These records rarely mention accumulation in residential or commercial structures, but often block roadways, and wash away rural roadways, fences, and cause damage to cropland.

Riverine flooding throughout the planning area varies. Special Flood Hazard Areas (SFHA) were identified via FIRMs produced by FEMA. These FIRMs have been georeferenced and placed in Appendix E. According to the currently identified SFHAs, unincorporated areas of Douglas County, Bridgeport, and East Wenatchee are at risk to riverine flooding. Of the three riverine flood records, only one reported a river gauge level of 1 foot above the river's crest.

Table 3.20 – Floodplain Classifications

| Zone Class | Description  |
|------------|--|
| A          | Areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.  |
| AE         | Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.  |
| AH         | Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between one and three feet. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown in this zone. Mandatory flood insurance purchase requirements and floodplain management standards apply. |
| B          | Areas subject to inundation by 0.2-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown.   |

### ***History & Probability***

Since 1997, NOAA has recorded 3 flash floods in the planning area. Most flash floods have shown to accumulate under 2 inches, but can accumulate up to 10 inches. These flash floods have not caused any personal injury or deaths in the planning area, but have caused \$60,000 in property damage.

Since 1997, NOAA has recorded 3 riverine floods in the planning area. Most riverine floods have shown to accumulate under 3 inches, but can accumulate up to 12 inches. These riverine floods have not caused any personal injury or deaths in the planning area, but have caused \$2,000 in property damage. For a complete list of NOAA recorded flash and riverine floods, please reference Appendix D.

Based on the data recorded by NOAA, the planning area should expect a notable flash flood at a rate of 0.14 per year. All FEMA identified SFHAs are classified as primary type A floodplains meaning they are subject to inundation at a rate of 1% per year. Please see the table on the following page for the various floodplain classifications that exist throughout the planning area.

### ***Vulnerability of and Impact on Facilities***

Douglas County and the participating jurisdictions have agricultural, commercial, industrial, and residential structures in floodplains. Flooding can cause minimal or complete damage to any of these types of facilities taking them offline for days to years depending on the resources available and remediation costs after an event.

The average riverine flood event in Douglas County costs \$666, while the existing range of a single incident has been from \$0 to \$2,000. The average flash flood costs \$20,000, while the existing range of a single incident has been from \$0 to \$40,000. The planning area has incurred a total of \$2,000 in property damage from riverine floods and \$60,000 in property damage from flash floods.

The planning areas municipal and school district structures are valued at \$3,663,786,700. Since flash flooding threatens the entire planning area, all structures are considered exposed and vulnerable. A GIS analysis of FEMA’s identified SFHAs puts a total of \$124,030,000 worth of the planning area’s municipal structural inventory exposed to riverine flooding. Please see the tables below for a breakdown of these values by type of flooding and jurisdiction.

**Table 3.21 – Vulnerable Municipal Structures by Count, Riverine Floods**

| Municipality    | Ag       | Com       | Gov      | Ind      | Res        | Res-M     | Total      |
|-----------------|----------|-----------|----------|----------|------------|-----------|------------|
| Uni-Douglas Co. | 7        | 3         | 0        | 3        | 274        | 1         | 288        |
| Bridgeport      | 1        | 3         | 0        | 1        | 77         | 4         | 86         |
| Coulee Dam      | 0        | 0         | 0        | 0        | 0          | 0         | 0          |
| East Wenatchee  | 1        | 17        | 2        | 2        | 210        | 11        | 243        |
| Mansfield       | 0        | 0         | 0        | 0        | 0          | 0         | 0          |
| Rock Island     | 0        | 0         | 0        | 0        | 0          | 0         | 0          |
| Waterville      | 0        | 0         | 0        | 0        | 0          | 0         | 0          |
| <b>Total =</b>  | <b>9</b> | <b>23</b> | <b>2</b> | <b>6</b> | <b>561</b> | <b>16</b> | <b>617</b> |

\*Multi-Unit Residential is defined as a structure with 5 or more residential units

\*\*The data are from the U.S. Census Bureau and FEMA

**Table 3.22 – Vulnerable Municipal Structures by Value, Riverine Floods**

| Municipality    | Ag                 | Com                 | Gov                | Ind                | Res                 | Res-M               | Total                |
|-----------------|--------------------|---------------------|--------------------|--------------------|---------------------|---------------------|----------------------|
| Uni-Douglas Co. | \$3,196,000        | \$1,894,000         | \$44,000           | \$376,000          | \$38,933,000        | \$322,000           | \$44,765,000         |
| Bridgeport      | \$314,000          | \$3,314,000         | \$0                | \$303,000          | \$9,021,000         | \$1,885,000         | \$14,837,000         |
| Coulee Dam      | \$0                | \$0                 | \$0                | \$0                | \$0                 | \$0                 | \$0                  |
| East Wenatchee  | \$116,000          | \$10,148,000        | \$1,163,000        | \$445,000          | \$35,516,000        | \$17,040,000        | \$64,428,000         |
| Mansfield       | \$0                | \$0                 | \$0                | \$0                | \$0                 | \$0                 | \$0                  |
| Rock Island     | \$0                | \$0                 | \$0                | \$0                | \$0                 | \$0                 | \$0                  |
| Waterville      | \$0                | \$0                 | \$0                | \$0                | \$0                 | \$0                 | \$0                  |
| <b>Total =</b>  | <b>\$3,626,000</b> | <b>\$15,356,000</b> | <b>\$1,207,000</b> | <b>\$1,124,000</b> | <b>\$83,470,000</b> | <b>\$19,247,000</b> | <b>\$124,030,000</b> |

\*Multi-Unit Residential is defined as a structure with 5 or more residential units

\*\*The data are from the U.S. Census Bureau and FEMA

### Vulnerability of and Impact on Critical Facilities

Since flash floods have the potential to affect the entire planning area, all of this plan’s identified critical facilities are equally vulnerable to flash flooding. Of the planning area’s 50 critical facilities, only the Bridgeport Water Treatment Facility is located within an identified floodplain.

### Vulnerability of and Impact on Population

If evacuation is not heeded, or flood waters rise quickly enough, Douglas County and it participating jurisdictions’ population can drown or become trapped on rooftops or points of high elevations. Depending on the conditions, this will expose them to elements and deprive them of basic needs and services.

As described previously, water that is long lasting and slow to drain will encourage the growth of mold and other bio-hazardous material, rendering a facility unusable until remediation is finished. Extra care, assessment, and sanitization are required before students and staff can re-inhabit a school or university facility, or they may face serious health concerns. Assisted care facilities housing vulnerable populations

can take longer to evacuate. Additionally, the potential presence of mold after a flood requires extra care to be taken before their population can re-inhabit an assisted care facility where the inhabitants are at greater risk of infection.

The planning area has not experienced any direct injuries or deaths as a result of flash or riverine flooding. The entire population of 42,907 and their 16,985 housing units are considered vulnerable and exposed to flash flooding while 1,711 residents in 674 housing units are currently identified as exposed and vulnerable to riverine floods. Similarly, all of the Eastmont School District’s 6,178 students and their respective 719 staff are considered vulnerable and exposed to flash flooding.

**Table 3.23 – Vulnerable Municipal Populations, Riverine Flooding**

| Municipality    | Population | Housing Units |
|-----------------|------------|---------------|
| Uni-Douglas Co. | 698        | 275           |
| Bridgeport      | 260        | 93            |
| Coulee Dam      | 0          | 0             |
| East Wenatchee  | 753        | 306           |
| Mansfield       | 0          | 0             |
| Rock Island     | 0          | 0             |
| Waterville      | 0          | 0             |
| Total =         | 1,711      | 674           |

*\*Multi-Unit Residential is defined as a structure with 5 or more residential units*

*\*\*The data are from the U.S. Census Bureau and FEMA*

### ***Vulnerability of and Impact on Systems***

Flash flooding does not often cause widespread damage to property or infrastructure limited its ability to impact systems. Even in the case of a swept away roadway, the problem is often limited to secondary roadways. However, catastrophic riverine flooding can cause significant damage to a community’s systems.

Extensive riverine flooding can significantly impact local governments’ ability to provide basic goods and services to their communities either by losing essential facilities or by blocked infrastructure. This can take the form of lost law enforcement, fire prevention, medical, or water treatment facilities. The Douglas County PUD does not maintain significant facilities in any identified flood plains, however, flash flooding could indiscriminately take out power in isolated incidents for a short period of time.

Significant damage to residential and or commercial structures can irrevocably damage a community and its economy creating refugees and economic hardship. If a chemical facility is significantly impacted it is possible the chemicals stored at the facilities can wash away with the flood waters and have detrimental effects on the local environment.

### ***Key Considerations***

Currently, there are no repetitive loss or severe repetitive loss properties within the planning area. Additionally, the population growth that the county, Bridgeport, East Wenatchee, and Rock Island have experienced has not occurred in identified floodplains.

## 3.7 – Landslides

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Landslides are the downward and outward movement of slopes. Landslides include a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on and over steepened slopes is the primary reason for a landslide, landslides are often prompted by the occurrence of other disasters. Other contributing factors include the following: erosion; steep slopes; rain and snow; and earthquakes.



Slope material often becomes saturated with water and may develop a debris or mudflow. If the ground is saturated, the water weakens the soil and rock by reducing cohesion and friction between particles. Cohesion (which is the tendency of soil particles to "stick" to each other) and friction affect the strength of the material in the slope and contribute to a slope's ability to resist-down slope movement. Saturation also increases the weight of the slope materials and, like the addition of material on the upper portion of a slope, increases the gravitational force on the slope. Undercutting of a slope reduces the slope's resistance to the force of gravity by removing much-needed support at the base of the slope. Alternating cycles of freeze and thaw can result in a slow, virtually imperceptible loosening of rock, thereby weakening the rock and making it susceptible to slope failure. The resulting slurry of rock and mud can pick up trees, houses, and cars, and block bridges and tributaries, causing flooding along its path. Additionally, removal of vegetation can leave a slope much more susceptible to superficial landslides because of the loss of the stabilizing root systems.

### ***Location & Extent***

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Landslides have the potential to destroy structures and infrastructure or block transportation in mountainous valleys. Although the overall risk is limited, its potential varies throughout Douglas County, with sporadic risk zones identified by the USGS. Additionally, landslides have been reported along Highway 2 just west of Waterville.

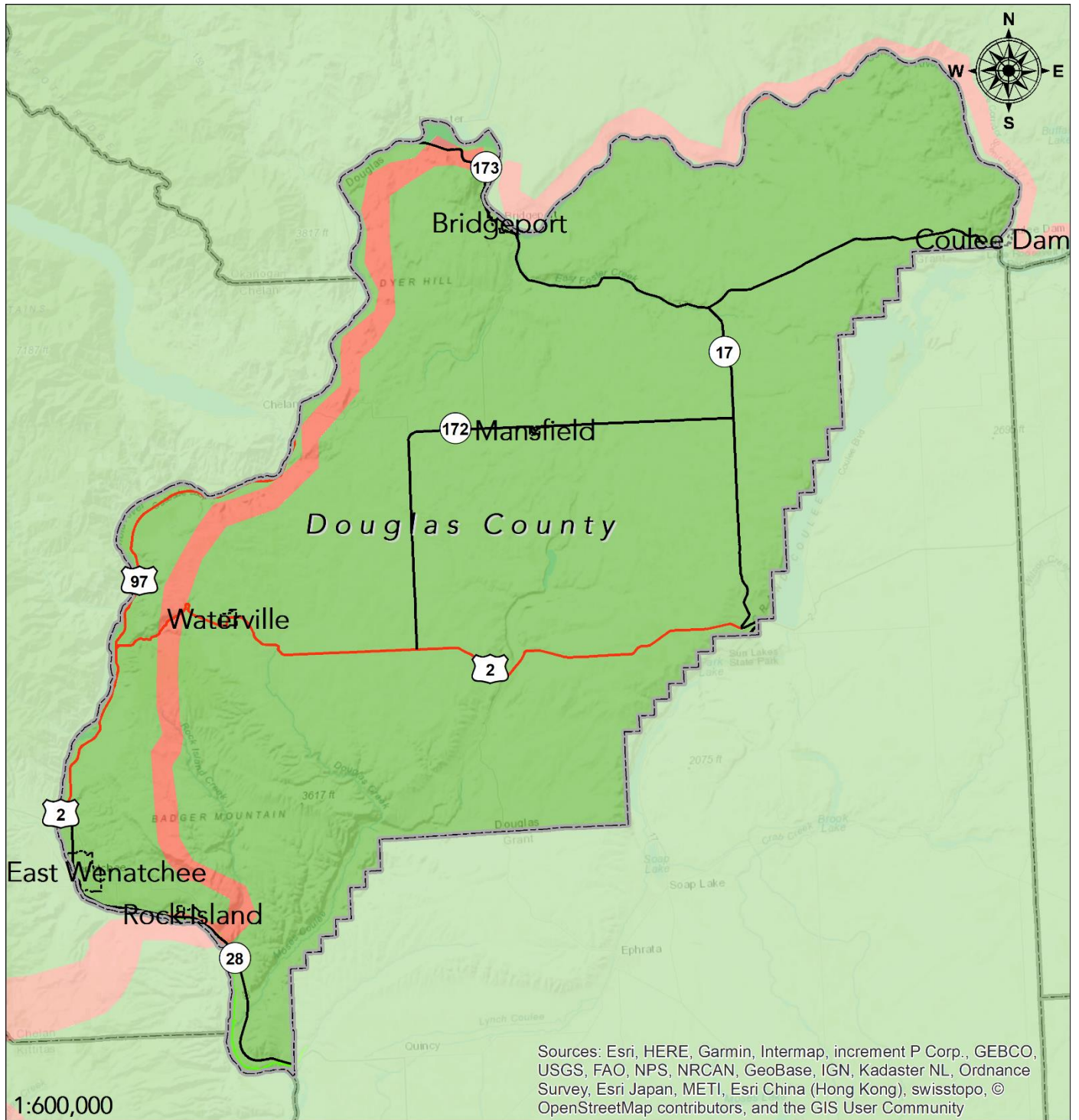
None of the participating jurisdictions in the plan are at risk with the exception of the county at large and the City of Rock Island. The identified risk zones are not a danger to Douglas County's densely populated areas. Please see the maps on the following pages for the State of Washington's identified risk zones and the location of Highway 2 and County Route 28.

### ***History & Probability***

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Landslides can occur without the presence of another hazard event, but often occur as a secondary hazard. Incidents of heavy rain, melting snow, earthquakes, and land subsidence are their primary cause. Hence, their future occurrences are highly dependent on the likelihood of the mentioned hazards. Douglas County does not have a history of significant or threatening landslides near population areas, although on January 12<sup>th</sup>, 2016 there was a significant landslide the completely blocked Highway 2 just west of Waterville. This landslide is shown in the photo at the beginning of this hazard profile.

Map 3.10 – Landslides, Douglas County



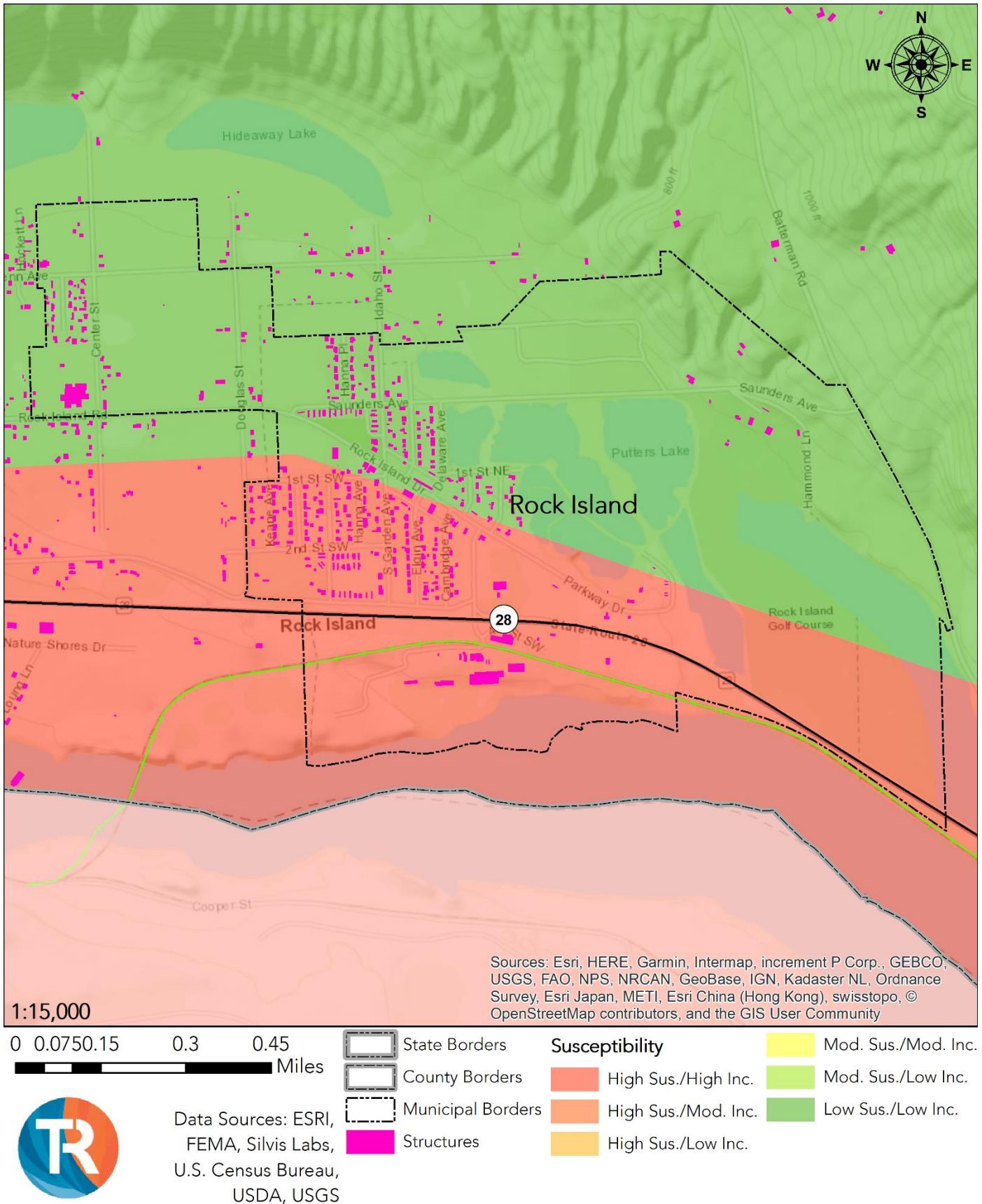
- State Borders
- County Borders
- Municipal Borders

- Susceptibility**
- High Sus./High Inc.
  - High Sus./Mod. Inc.
  - Mod. Sus./Mod. Inc.
  - Mod. Sus./Low Inc.
  - Low Sus./Low Inc.



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

Map 3.11 – Landslides, Rock Island



### 3.7 – Landslides

There have been no recorded injuries or deaths in the planning area from landslides. Additionally, there has not been any property damage recorded from landslides. Given the lack of multiple events, the future probability is classified as “rare.”

#### Vulnerability of and Impact on Facilities

Landslides can have minimal or devastating impacts on facilities. The degree of vulnerability depends on the specifics of the landslide itself. Damage to a structure can range from minimal to complete destruction. None of the Eastmont School District’s structures are within the identified landslide risk areas. A total of \$114,773,000 of Douglas County and the City of Rock Island’s municipal inventory is located within areas identified as highly susceptible to landslides. The inventory is detailed in the tables below.

**Table 3.24 – Vulnerable Municipal Structures by Count, Landslides**

| Municipality    | Ag | Com | Gov | Ind | Res | Res-M | Total |
|-----------------|----|-----|-----|-----|-----|-------|-------|
| Uni-Douglas Co. | 10 | 7   | 0   | 2   | 536 | 1     | 556   |
| Bridgeport      | 0  | 0   | 0   | 0   | 0   | 0     | 0     |
| Coulee Dam      | 0  | 0   | 0   | 0   | 0   | 0     | 0     |
| East Wenatchee  | 0  | 0   | 0   | 0   | 0   | 0     | 0     |
| Mansfield       | 0  | 0   | 0   | 0   | 0   | 0     | 0     |
| Rock Island     | 0  | 6   | 1   | 1   | 178 | 1     | 187   |
| Waterville      | 0  | 0   | 0   | 0   | 0   | 0     | 0     |
| Total =         | 10 | 13  | 1   | 3   | 714 | 2     | 743   |

\*Multi-Unit Residential is defined as a structure with 5 or more residential units

\*\*The data are from the U.S. Census Bureau and FEMA

**Table 3.25 – Vulnerable Municipal Structures by Value, Landslides**

| Municipality    | Ag          | Com         | Gov       | Ind       | Res           | Res-M       | Total         |
|-----------------|-------------|-------------|-----------|-----------|---------------|-------------|---------------|
| Uni-Douglas Co. | \$3,928,000 | \$1,991,000 | \$0       | \$342,000 | \$80,452,000  | \$1,109,000 | \$87,822,000  |
| Bridgeport      | \$0         | \$0         | \$0       | \$0       | \$0           | \$0         | \$0           |
| Coulee Dam      | \$0         | \$0         | \$0       | \$0       | \$0           | \$0         | \$0           |
| East Wenatchee  | \$0         | \$0         | \$0       | \$0       | \$0           | \$0         | \$0           |
| Mansfield       | \$0         | \$0         | \$0       | \$0       | \$0           | \$0         | \$0           |
| Rock Island     | \$63,000    | \$1,909,000 | \$451,000 | \$99,000  | \$23,320,000  | \$1,109,000 | \$26,951,000  |
| Waterville      | \$0         | \$0         | \$0       | \$0       | \$0           | \$0         | \$0           |
| Total =         | \$3,991,000 | \$3,900,000 | \$451,000 | \$441,000 | \$103,772,000 | \$2,218,000 | \$114,773,000 |

\*Multi-Unit Residential is defined as a structure with 5 or more residential units

\*\*The data are from the U.S. Census Bureau and FEMA

#### Vulnerability of and Impact on Critical Facilities

None of the identified 50 critical facilities are located in moderate or high landslide susceptibility areas.

#### Vulnerability of and Impact on Population

Landslides pose a minimal risk to Douglas County and its participating jurisdictions’ population. Only parts of Rock Island and the unincorporated county have identified landslide high susceptibility zones. That being said, it is possible for a landslide to impact traveling motorists on its roadways. Depending on the topography and circumstances of the landslide, this could simply immobilize a vehicle, cover it in debris, or cause serious to mortal bodily harm to the vehicle’s inhabitants.

### 3.7 – Landslides

None of the Eastmont School District’s students are vulnerable to landslides. Of Douglas County and the City of Rock Island, 1,564 of their residents in 741 housing units are located in identified high susceptibility landslide areas.

There are no reported deaths or injuries from landslides in the planning area.

**Table 3.26 – Vulnerable Municipal Populations, Landslides**

| Municipality    | Population | Housing Units |
|-----------------|------------|---------------|
| Uni-Douglas Co. | 1,005      | 546           |
| Bridgeport      | 0          | 0             |
| Coulee Dam      | 0          | 0             |
| East Wenatchee  | 0          | 0             |
| Mansfield       | 0          | 0             |
| Rock Island     | 559        | 195           |
| Waterville      | 0          | 0             |
| Total =         | 1,564      | 741           |

\*Multi-Unit Residential is defined as a structure with 5 or more residential units

\*\*The data are from the U.S. Census Bureau and FEMA

### ***Vulnerability of and Impact on Systems***

Douglas County and its participating jurisdictions’ systems are minimally vulnerable to landslides. A landslide has the potential to temporarily block a major highway or transportation network for weeks at a time. Additionally, if the landslide occurs in tandem with another hazard, such a severe storm event, the blocking of a major route will have compounded effects on response and recovery operations. Emergency personnel may have to use far, out of the way routes, delaying necessary aid to Douglas County and its participating jurisdictions.

The Douglas County PUD is aware of minimal landslide risk to its electrical transportation infrastructure. However, it is unlikely that a landslide in the planning area would significantly cause problems for them as any incident would likely be isolated and minor.

### ***Key Considerations***

Construction age of a structure is unlikely to affect its resiliency to landslides. Currently, construction techniques are not directly implemented that would increase a buildings resistance to the types of forces it would experience from a landslide.

Unincorporated Douglas County and Rock Island have seen significant population growth since the development of their last hazard mitigation plan (Measured at greater than 5% growth). These communities have grown in identified high susceptibility landslide areas and are therefore considered to be more vulnerable and at risk to landslides than they were at the time their last plan was developed.

## 3.8 – Severe Storms

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Severe storms comprise the hazardous and damaging weather effects often found in violent storm fronts. They can occur together or separate, they are common and usually not hazardous, but on occasion they can pose a threat to life and property.

This plan defines Severe Storms as a combination of the following severe weather effects as defined by NOAA and the NWS.



*Hail:* Showery precipitation in the form of irregular pellets or balls of ice more than 5 mm in diameter, falling from a cumulonimbus cloud.

*High/Strong Wind:* Sustained wind speeds of 40 miles per hour or greater lasting for 1 hour or longer, or winds of 58 miles per hour or greater for any duration. Often referred to as straight line winds to differentiate from rotating or tornado associated wind.

*Lightning:* A visible electrical discharge produced by a thunderstorm. The discharge may occur within or between clouds, between the cloud and air, between a cloud and the ground or between the ground and a cloud.

*Thunderstorm Winds:* The same classification as high or strong winds, but accompanies a thunderstorm. It is also referred to as a straight-line wind to differentiate from rotating or tornado associated wind.

For consistency with the NWS and NOAA, high and strong winds are shown separate from thunderstorm winds when raw, collected data is displayed. However, for their impacts and probability, they are combined and referred to simply as “wind” events.

### **Location & Extent**

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Severe storms are an area-wide hazard as they can strike anywhere in the planning area. Storms, severe or not, are often predicted within a day or multiple days in advance.

The severity of a storm is not as easily predicted and when it is, the window of notification is up to a few hours to under an hour. When a storm is imminent, it is unknown whether or not hail, lightning, or damaging winds will occur until after an incident has been reported. Since severe storms typically affect an area the size of a region, the expected intensity is the same throughout the planning area. Thunderstorms, and the accompanying hail, lightning, and wind, typically last less than an hour. The portions of this timeframe where each storm classification would be considered “severe” should last less than 30 minutes.

Strong, high, and thunderstorm winds are classified as winds which occur between 40 and 70 miles per hour lasting for 1 hour or greater or of 58 miles per hour for any duration. The Beaufort Scale shown on the next page displays the ranges of wind speed and correlates them with their typical effects. At a level 7 and 8 citizens should remain indoors and anywhere above a level 8 will cause damage to structures. Damage to any amount of structures can cause serious disruption to Douglas County and its

participating jurisdictions. The scope of damage can range from one residential house up to widespread destruction of homes and reinforced buildings throughout the county. The planning area occasionally receives wind events between 50 and 60 miles per hour or a Beaufort level between 9 and 10.

**Table 3.27 – Beaufort Scale**

| Beaufort Number | Wind Speed (Mph) | Seaman’s Term   | Effects  |
|-----------------|------------------|-----------------|--|
| 0               | Under 1          | Calm            | Calm, smoke rise vertically  |
| 1               | 1 – 3            | Light Air       | Smoke drift indicates wind direction, but vanes do not move        |
| 2               | 4 – 7            | Light Breeze    | Wind felt on face, leaves rustle, vanes begin to move              |
| 3               | 8 – 12           | Gentle Breeze   | Leaves, small twigs in constant motion, light flags extended       |
| 4               | 13 – 18          | Moderate Breeze | Dust, leaves, and loose paper raised up, small branches move       |
| 5               | 19 – 24          | Fresh Breeze    | Small trees begin to sway  |
| 6               | 25 – 31          | Strong Breeze   | Large branches of trees in motion, whistling heard in wires        |
| 7               | 32 – 38          | Moderate Gale   | Whole trees in motion, resistance felt in walking against the wind |
| 8               | 39 – 46          | Fresh Gale      | Twigs and small branches brake off of trees                        |
| 9               | 47 – 54          | Strong Gale     | Slight structural damage occurs, slate blown from roofs            |
| 10              | 55 – 63          | Whole Gale      | Trees broken, structural damage occurs                             |
| 11              | 64 – 72          | Storm           | Widespread damage  |
| 12              | 73 or Higher     | Hurricane Force | Violence and destruction   |

It can safely be assumed any severe storm has the potential to cause a lightning strike. It can happen instantly with no warning and happen anytime throughout the storm’s passage. A storm’s lightning intensity is measured by lightning activity intensity levels outlined in the table on the following page. A strike could damage structures throughout the county and render it unusable for a period of time, or cause it to catch fire and damage it beyond repair. Most lightning strikes do not hit structures or people and therefore go unreported. The planning area can and has experienced lightning of all intensities listed in the table below.

**Table 3.28 – Lightning Activity Intensity Scale**

| Level | Description  |
|-------|--|
| LAL 1 | No activity  |
| LAL 2 | Isolated thunderstorms: Light rain will occasionally reach the ground. Lightning is very infrequent, 1 to 5 cloud-to-ground strikes in a 5-minute period.    |
| LAL 3 | Widely scattered thunderstorms: Light to moderate rain will reach the ground. Lightning is infrequent, 6 to 10 cloud-to-ground strikes in a 5-minute period. |
| LAL 4 | Scattered thunderstorms: Moderate rain is commonly produced Lightning is frequent, 11 to 15 cloud-to-ground strikes in a 5-minute period.                    |
| LAL 5 | Numerous thunderstorms: Rainfall is moderate to heavy. Lightning is frequent and intense, greater than 15 cloud-to-ground strikes in a 5-minute period.      |

Hail typically falls in sizes anywhere from 0.75 to 1.00 inches in the planning area. A complete hail index with size and typical damages can be found in the table below. Any incidents of hail can cause injury to Douglas County and its participating jurisdictions’ citizens, while anything above 1 inch could cause damage to structures. If windows are broken, some facilities will be rendered unusable until repaired.

**Table 3.29 – NOAA/TORRO Hailstorm Intensity Scale**

| Class | Intensity Category   | Diameter (Inches) | Size Comparison            | Damage Impacts  |
|-------|----------------------|-------------------|----------------------------|---|
| H0    | Hard Hail            | 0 – 0.33          | Pea                        | No damage   |
| H1    | Potentially Damaging | 0.33 – 0.60       | Marble/Mothball            | Slight damage to crops  |
| H2    | Potentially Damaging | 0.60 – 0.80       | Dime/Grape                 | Significant damage to crops   |
| H3    | Severe               | 0.80 - 1.20       | Nickel to Quarter          | Severe damage to crops, damage to glass and plastic, paint and wood scored                    |
| H4    | Severe               | 1.20 - 1.60       | Half Dollar                | Widespread glass damage, vehicle bodywork damage  |
| H5    | Destructive          | 1.60 - 2.00       | Silver Dollar to Golf Ball | Damage to tiled roofs, significant risk of personal injury.                                   |
| H6    | Destructive          | 2.00 - 2.40       | Egg                        | Aircraft bodywork dented, brick walls pitted  |
| H7    | Very Destructive     | 2.40 - 3.00       | Tennis Ball                | Severe roof damage, risk of serious injuries to persons not protected                         |
| H8    | Very Destructive     | 3.00 - 3.50       | Baseball to Orange         | Severe damage to aircraft bodywork  |
| H9    | Super Hailstorms     | 3.50 - 4.00       | Grapefruit                 | Extensive structural damage, risk of severe injury or fatal injuries to persons not protected |
| H10   | Super Hailstorms     | 4.00 +            | Softball and up            | Extensive structural damage, risk of severe injury or fatal injuries to persons not protected |

### ***History & Probability***

Since 2004, NOAA has recorded 8 hailstorms in the planning area. Most hail has shown to remain around 1 inch in size, however, on occasion the planning area has seen hail larger than 1.5 inches. These hailstorms have not caused any personal injury or deaths in the planning area, nor any recorded property damage. However, it has cost the planning area \$5,960,000 in crop damage.

NOAA does not have records of lightning strikes in the planning area, however, the planning area received numerous lightning strikes per year.

Since 1997, NOAA has recorded 68 wind events in the planning area. Most of these events have been measured at between 50 to 60 miles per hour, but have a few have been measured in the 70s and 80s. Only one of these events has seriously injured 2 residents, but a wind event has never caused a death in the planning area. Wind events have caused a total of \$11,758,000 in property damage throughout the planning area.

For a complete list of NOAA recorded hail, high wind, lightning, and thunderstorm winds, please reference Appendix D.

Based on the data recorded by NOAA, the planning area should expect a hailstorm at a rate of 0.53 per year, a significant lightning strike at a rate of at least once a year, and a dangerous wind event at a rate of 2.96 per year.

#### ***Vulnerability of and Impact on Facilities***

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Structural vulnerability to severe storms is the same throughout Douglas County and its participating jurisdictions. Hail can be costly by damaging rooftops, outdoor equipment, and windows. Lightning can strike anything with the potential to significantly damage electrical infrastructure or ignite a fire. Wind events create flying debris which can damage infrastructure and buildings. Strong enough wind can cause structure damage to older, less well constructed buildings even toppling or leveling them. A FEMA Code 361 Tornado Safe Room will provide more than sufficient protection and resistance to any form of severe storm as they are designed and constructed above the standard metrics of a severe storm.

The average hailstorm in Douglas County and its participating jurisdictions costs \$0.

The average wind event in Douglas County and its participating jurisdictions costs \$195,966, while the existing range of a single incident has been from \$0 to \$10,000,000.

Douglas County and its participating jurisdictions' municipal and school district structures are valued at a total of \$3,663,786,700. Since severe storms threaten the entire planning area equally, all municipal and school district structures are considered exposed and vulnerable.

#### ***Vulnerability of and Impact on Critical Facilities***

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All infrastructure and critical facilities within the planning area are equally vulnerable and at risk since severe storms can affect any portion of the planning area and damage indiscriminately.

#### ***Vulnerability of and Impact on Population***

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Douglas County and its participating jurisdictions' vulnerability to severe storms is the same throughout the planning area. In the absence of proper shelter, hail can cause serious injury to an unprotected person. As long as Douglas County and its participating jurisdictions' citizens stay indoors and away from windows, they will be protected against hail injury and death. Similarly, they can avoid being struck by lightning by staying indoors. Although lightning may strike a structure sheltering people, it is extremely unlikely that the strike itself will directly injure or kill a sheltered person. As long as a structure is able to maintain its integrity during high speed winds, it will protect people from wind injury or death. However, old or poorly constructed facilities are not good shelters as previously mentioned, flying debris can break windows or cause structural damage. Either of these instances have the potential to seriously injure or kill anyone taking shelter in older, less well constructed building.

Douglas County and its participating municipal jurisdictions have a total population of 42,907 in 16,985 housing units all of which are vulnerable and at risk to tornadoes. Additionally, all of the Eastmont School District's 6,178 students and their 719 staff are considered exposed and vulnerable.

Historically, there have been 0 fatalities and 2 injuries recorded from severe storms in the planning area.

#### ***Vulnerability of and Impact on Systems***

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Douglas County and its participating jurisdictions' assets and systems' vulnerability to severe storms is the same throughout the planning area. The Douglas County PUD is highly vulnerable to severe storms in the form of high-speed winds as they have the potential to take down power lines and poles depending on the severity of a storm. A significantly strong and widespread storm has the potential to take out power for days to weeks throughout any portion of the planning area.

Hail damage is typically superficial and does not hamper a community's assets, systems, or activities. Lightning strikes can destroy or damage a community asset, but since their strikes are typically isolated and rarely hit anything, it is unlikely to significantly impact a larger system. Wind events can destroy and damage multiple structures and points of infrastructure. It has the potential to significantly impact a community's power grid compounding the effects of other hazards such as, extreme heat, tornadoes, and winter storms. School district buses are considered vulnerable as they can be damaged by hail, by falling trees and other debris, as well as be exposed to hazardous driving conditions from high speed winds.

#### ***Key Considerations***

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Since severe storms strike over large areas and indiscriminately, there is not any particular portion of the planning area that is more likely than another to experience a severe storm. However, there are portions of the planning area that are more vulnerable to hail and wind related damage due to the age of a significant portion of their building stock.

Unincorporated Douglas County, Coulee Dam, Mansfield, and Waterville all retain significant levels of building stock constructed prior to the 1960s. These buildings were generally constructed to lower wind resistant standards and codes and thus these jurisdictions are considered more vulnerable.

Unincorporated Douglas County, Bridgeport, East Wenatchee, and Rock Island have seen significant population growth since the development of their last hazard mitigation plan (Measured at greater than 5% growth). These communities are considered to be more vulnerable and at risk to severe storms than they were at the time their last plan was developed.

## 3.9 – Tornadoes

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A tornado is a violent, dangerous, rotating column of air that is in contact with both the surface of the earth and a cumulonimbus cloud or, in rare cases, the base of a cumulus cloud. Often referred to as a twister or a cyclone, they can strike anywhere and with little warning. Tornadoes come in many shapes and sizes, but are typically in the form of a visible condensation funnel, whose narrow end touches the earth and is often encircled by a cloud of debris and dust.



Tornadoes can cause several kinds of damage to buildings. Tornadoes have been known to lift and move objects weighing more than 3 tons, toss homes more than 300 feet from their foundations, and siphon millions of tons of water. However, less spectacular damage is much more common. Houses and other obstructions in the path of the wind cause the wind to change direction. This change in wind direction increases pressure on parts of the building. The combination of increased pressures and fluctuating wind speeds creates stress on the building that frequently causes connections between building components, roofing, siding, windows, etc., to fail. Tornadoes can also generate a tremendous amount of flying debris. If wind speeds are high enough, airborne debris can be thrown at buildings with enough force to penetrate windows, roofs, and walls.

### *Location & Extent*

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Many tornadoes only exist for a few seconds in the form of a touchdown. A tornado may arrive with a storm front and touchdown in a matter of seconds without warning. Other times tornado watches and sirens will alert communities of high potential tornado producing weather or an already formed tornado and its likely path.

The most extreme tornados can attain wind speeds of more than 200 mph, stretch more than two miles across, and travel dozens of miles. Tornadoes are an area-wide hazard as they can strike anywhere in the planning area.

Until 2007 the Fujita Tornado Scale ranked the severity of tornadoes. The Fujita scale assigned a numerical F value, F0 through F5, based on the wind speeds and estimated damage. Since 2007 the U.S. switched over to the Enhanced Fujita Scale. The altered scale adjusted the wind speed values per F level and introduced a rubric for estimating damage. Most tornados have wind speeds less than 110 miles per hour, and travel a few miles before dissipating. The planning area should expect to see only EF0 tornadoes, but should be prepared for the potential of an EF2.

Table 3.30 – Fujita Scale

| Fujita Scale |                           | EF Scale |                           |
|--------------|---------------------------|----------|---------------------------|
| Fujita Scale | 3-Second Gust Speed (mph) | EF Scale | 3-Second Gust Speed (mph) |
| F0           | 45-78                     | EF0      | 65-85                     |
| F1           | 79-117                    | EF1      | 86-109                    |
| F2           | 118-161                   | EF2      | 110-137                   |
| F3           | 162-209                   | EF3      | 138-167                   |
| F4           | 210-261                   | EF4      | 168-199                   |
| F5           | 262-317                   | EF5      | 200-234                   |

**History & Probability**

Since 1954, the NWS has recorded 3 tornadoes in the planning area. All three were EF0s, but there has been an EF1 and an EF2 in neighboring counties. These EF0s in the planning area have not injured or killed anyone. Further, they did not cause any recorded property damage. For a complete list of NWS recorded tornadoes, please reference Appendix D.

Based on the data recorded by the NWS, the planning area should expect a tornado at a rate of 0.05 tornadoes per year.







**Vulnerability of and Impact on Facilities**

Most tornadoes are in the EF0 – EF2 class. Building to modern wind standards and state codes provides significant protection from these hazard events; however, a community in the direct path of a violent, high scale tornado can do little to prevent significant property damage. Designing buildings to protect against extreme wind speeds, such as those associated with an EF4 or EF5 is extremely challenging and cost prohibitive. Anything less than a FEMA Code 361 compliant structure is susceptible to significant damage or complete destruction. A comparison of EF scale to the expected impact on facilities can be seen in Table 3.28.

The average tornado event in the planning costs \$0, while the existing range of a single incident has been has only occurred in the EF0 class.

Douglas County and its participating jurisdictions’ municipal, and school district structures are valued at a total of \$3,663,786,700. Since tornadoes threaten the entire planning area equally, all municipal and school district structures are considered exposed and vulnerable.

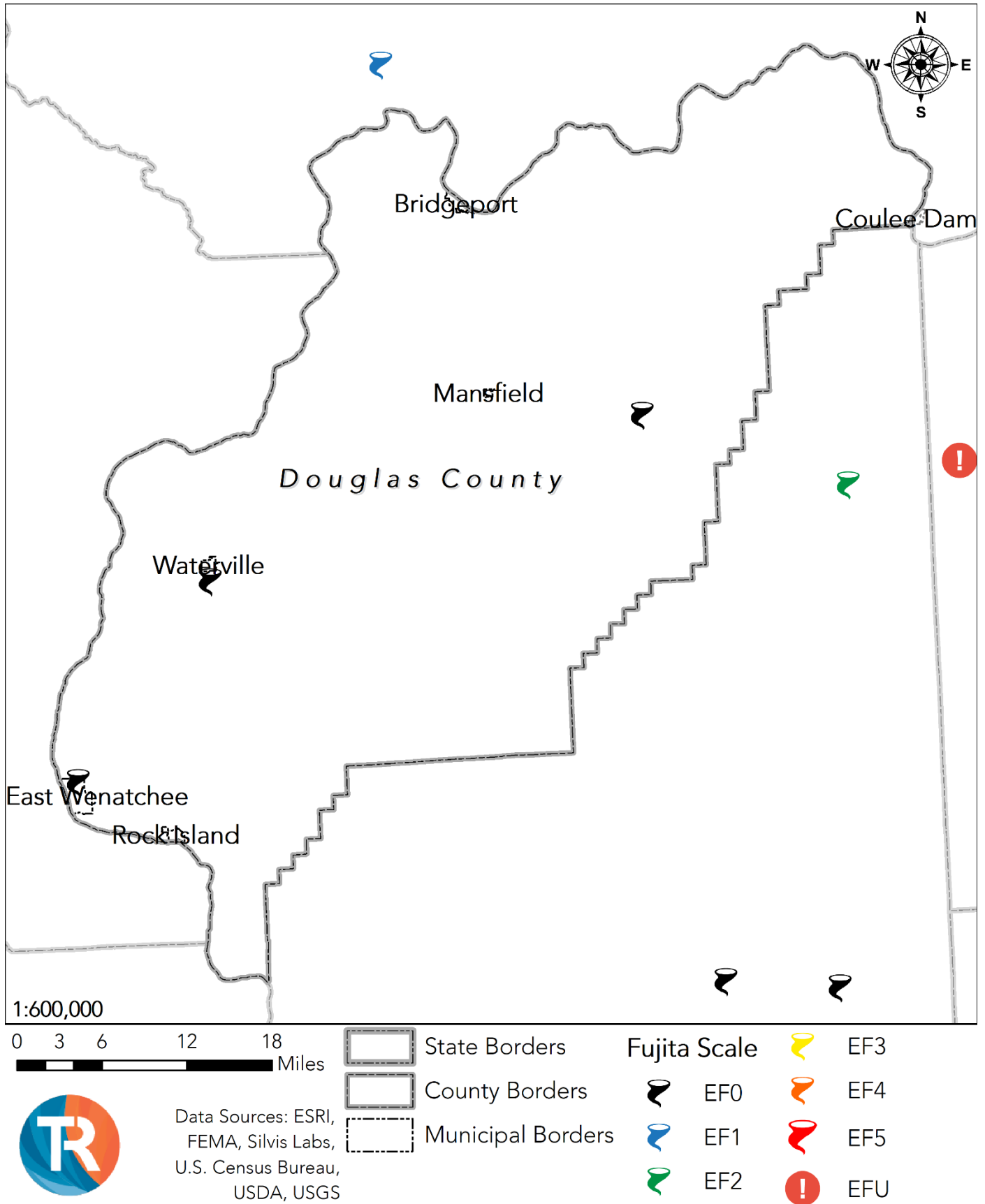
Table 3.31 – Fujita Damage Scale

|            |   |  |
|------------|---|--|
| <b>EF5</b> |    | <b>Incredible:</b> Strong frame houses are lifted from foundations, reinforced concrete structures are damaged, automobile-sized missiles become airborne, trees are completely debarked.    |
| <b>EF4</b> |    | <b>Devastating:</b> Well-constructed houses are destroyed, some structures are lifted from foundations and blown some distance, cars are blown some distance, large debris becomes airborne. |
| <b>EF3</b> |    | <b>Severe:</b> Roofs and some walls are torn from structures, some small buildings are destroyed, non-reinforced masonry buildings are destroyed, most trees in forest are uprooted.         |
| <b>EF2</b> |   | <b>Considerable:</b> Roof structures are damaged, mobile homes are destroyed, debris becomes airborne (missiles are generated), large trees are snapped or uprooted.                         |
| <b>EF1</b> |  | <b>Moderate:</b> Roof surfaces are peeled off, windows are broken, some tree trunks are snapped, unanchored mobile homes are overturned, attached garages may be destroyed.                  |
| <b>EF0</b> |  | <b>Light:</b> Chimneys are damaged, tree branches are broken, shallow-rooted trees are toppled.  |

**Vulnerability of & Impact on Critical Facilities**

All infrastructure and critical facilities within the planning are equally vulnerable and at risk since tornadoes can affect any portion of the planning area and damage indiscriminately.

Map 3.12 – Historical Tornadoes, Douglas County



### ***Vulnerability of and Impact on Population***

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An EF4 or EF5 tornado has the potential to level the smaller jurisdictions and kill everyone in them while being able to do nearly the same in the larger ones. A lesser magnitude tornado has the ability to kill and injure citizens as it rips off the roofs and walls of its structures while launching airborne missiles born from debris.

Douglas County and its participating municipal jurisdictions have a total population of 42,907 in 16,985 housing units all of which are vulnerable and at risk to tornadoes. Additionally, all of the Eastmont School District's 6,178 students and their 719 staff are considered exposed and vulnerable.

### ***Vulnerability of and Impact on Systems***

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All of the planning area's community assets and systems' vulnerability to tornadoes is equal throughout the planning area. The Douglas County PUD is highly vulnerable to tornadoes given electrical transportation infrastructure's inherent weakness to high-speed winds. As mentioned in the severe storms hazard profile, they have the potential to take down power lines and poles depending on a tornado's severity. A significantly strong or long travelling tornado has the potential to take out power for days to weeks throughout any portion of the planning area.

A small magnitude tornado will not significantly damage a community and its systems, but a larger magnitude tornado can impact a community for weeks, months, or years and even destroy a city completely. Significant damage to any portion of the planning area would hinder the community's economy and increase its social vulnerability.

### ***Key Considerations***

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Since severe storms strike over large areas and indiscriminately, there is not any particular portion of the planning area that is more likely than another to experience a severe storm. However, there are portions of the planning area that are more vulnerable to hail and wind related damage due to the age of a significant portion of their building stock.

Unincorporated Douglas County, Coulee Dam, Mansfield, and Waterville all retain significant levels of building stock constructed prior to the 1960s. These buildings were generally constructed to lower wind resistant standards and codes and thus these jurisdictions are considered more vulnerable.

Unincorporated Douglas County, Bridgeport, East Wenatchee, and Rock Island have seen significant population growth since the development of their last hazard mitigation plan (Measured at greater than 5% growth). These communities are considered to be more vulnerable and at risk to tornadoes than they were at the time their last plan was developed.

## 3.10 – Wildfires

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The NWS defines a wildfire as: Any free burning uncontrollable wildland fire not prescribed for the area which consumes the natural fuels and spreads in response to its environment. They can occur naturally, by human accident, and on rare occasions by human action. Typically, their point of origin is far from human development with the exception of roads, power lines, and similar rural infrastructure. There is a constant threat to hikers, campers, and other people engaging in outdoor activities. Significant danger to life and property occurs when human development meets and becomes intertwined with wildland's vegetation. The threat of wildfire and grass fires increases in areas prone to intermittent drought, or are generally arid or dry.



Population de-concentration in the U.S. has resulted in rapid development in the outlying fringe of metropolitan areas and in rural areas with attractive recreational and aesthetic amenities, especially forests, communities bordering forests and prairies where fires branch off. This demographic change is increasing the size of the wildland-urban interface (WUI), defined as the area where structures and other human development meet or intermingle with undeveloped wildland. Its expansion has increased the likelihood that wildland and grass fires will threaten life and property.

### *Location & Extent*

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Douglas County and the planning area's fire response efforts are not inhibited by mountainous or significantly vegetated large areas that traditionally make it difficult to extinguish fires. However, fires often begin in neighboring counties that are mountainous and difficult to extinguish and then spread to the planning area. Wildfires can occur almost anywhere throughout the planning area, there is ample fuel for them and they often gain momentum quickly.

The vast majority of wildland and grass fires that occur in the planning area occur in areas containing brush, grass, and crops. Although these types of fuel do not pose as intense a level of a fire as does heavily vegetated forests, nearly every acre of undeveloped land in the planning area is covered in by some form of vegetation that could act as fuel for a fire. The map on the following page depicts the basic varieties of vegetation throughout the planning area.

The planning area is most often affected by grass and brush fires. Evacuations are common. Given the conditions present in the planning area, a fire should not be expected to supersede Rank 3 on the index below.

**Table 3.32 – Burn Severity Index**

| Rank | Burn Severity             | Description   | Characteristics  |
|------|---------------------------|---|--|
| 0    | Unburned                  | Fire extinguished before reaching microsite   | <ul style="list-style-type: none"> <li>• Leaf litter from previous years intact and uncharred</li> <li>• No evidence of char around base of trees and shrubs</li> <li>• Pre-burn seedlings and herbaceous vegetation present.</li> </ul>   |
| 1    | Low Severity Burn         | Surface fire which consumes litter yet has little effect on trees and understory vegetation.  | <ul style="list-style-type: none"> <li>• Burned with partially consumed litter present</li> <li>• Evidence of low flame heights around base of trees and shrubs (&lt;0.5 m)</li> <li>• No significant decreases in overstory &amp; understory basal area, diversity or species richness from pre-burn assessments</li> <li>• Usually burning below 80 ° C</li> </ul> |
| 2    | Medium-Low Severity Burn  | No significant differences in overstory density and basal area, & no significant differences in species richness. However, understory density, basal area, and species richness declined. | <ul style="list-style-type: none"> <li>• No litter present and 100% of the area covered by duff</li> <li>• Flame lengths &lt; 2 m</li> <li>• Understory mortality present, little or no overstory mortality</li> </ul>   |
| 3    | Medium-High Severity Burn | Flames that were slightly taller than those of Medium-low intensity fires, but these fires had occasional hot spots that killed large trees, With significant reduction in the understory | <ul style="list-style-type: none"> <li>• Soil exposure on 1-50% of the area</li> <li>• Flame lengths &lt;6m</li> <li>• High understory mortality with some overstory trees affected</li> </ul>   |
| 4    | High Severity Burn        | Crown fires, usually a stand replacing burn with relatively high overstory mortality  | <ul style="list-style-type: none"> <li>• Soil exposure &gt;50%</li> <li>• Flame lengths &gt;6m</li> <li>• Higher overstory mortality &gt;20%</li> <li>• Usually burning above 800 ° C</li> </ul>   |

*\*This index is courtesy of the Southern Appalachian Forest Coalition.*

Most wildland fires occur without warning and spread quickly but the event depends upon a number of conditions. Wind can turn a small flame into a multi-acre grassfire within a matter of minutes, while this can be further compounded by the level of moisture and available fuel based on the area’s land use.

### **History & Probability**

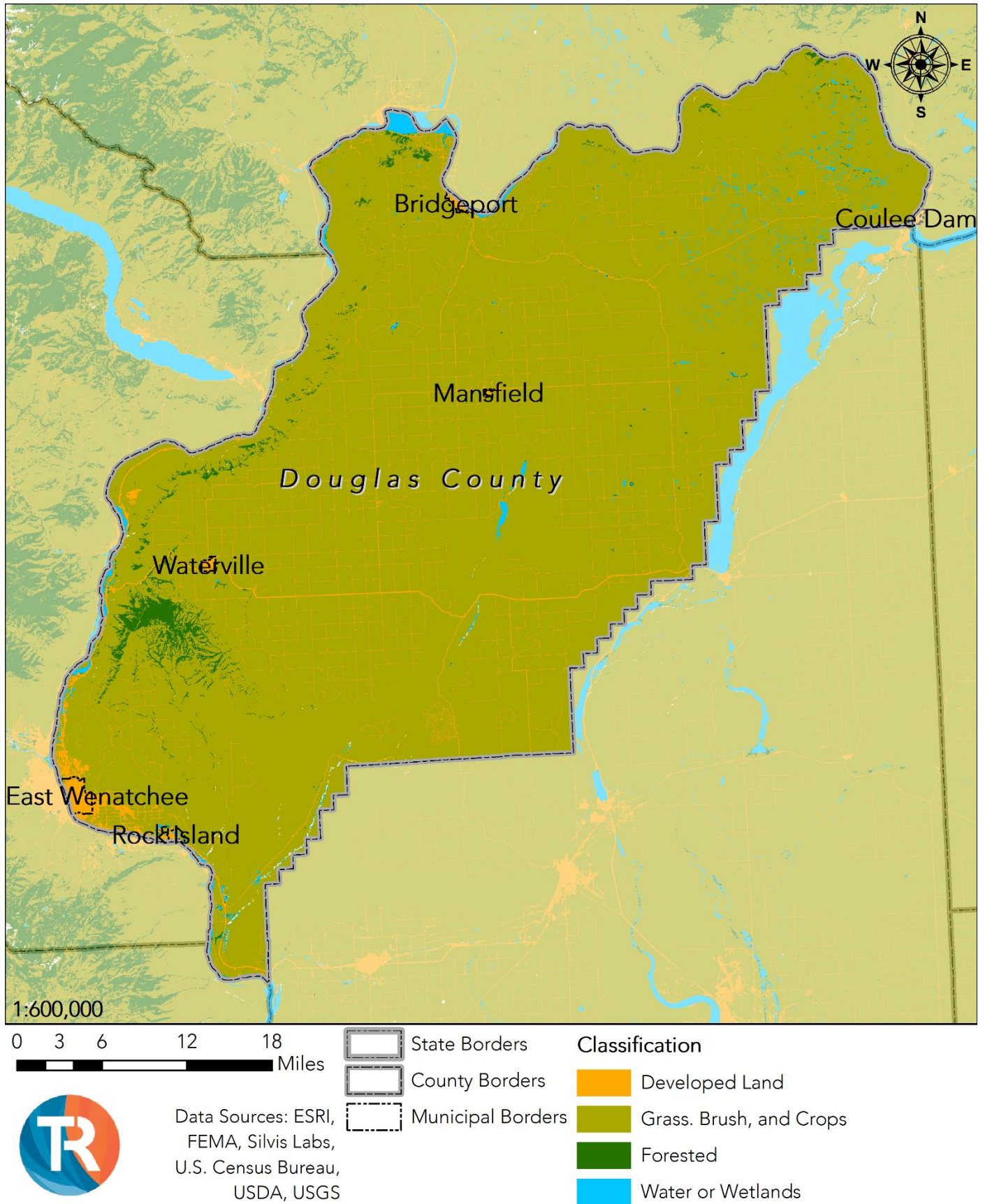
Douglas County and the planning area is plagued by considerable wildfires throughout the year and their risk is compounded by the presence of vegetative fuels and reoccurring drought conditions. Since 2006, the planning area has experienced 72 significant wildfires occurring at a rate of 5.14 fires per year. It should expect this rate to continue in the future.

These fires have burned an estimated 1,088,943 acres of land causing \$127,822,500 in recorded property damage and \$1,360,000 in recorded crop losses.

### **Vulnerability of and Impact on Facilities**

A wildland fire burning near a jurisdiction may cover it in soot, cause secondary fires from traveling coals, or directly engulf facilities burning them to the ground. Properties located in some rural areas can prove more difficult to reach by first responders. Additionally, many of these rural locations do not have adequate water supplies for first responders to utilize in extinguishing these fires, causing them to

Map 3.13 – Vegetative Fuel, Douglas County



spread farther than they normally would. Facilities can be protected by creating defensible spaces or, maintaining a fuel free environment, and structural modifications to prevent the growth of a wildfire.

Wildfires threaten almost every structure that exists in a vegetated area as depicted in Map 3.13 located earlier in this hazard profile. Douglas County and its participating jurisdictions’ municipal structures are valued at \$3,663,786,700 all of which are vulnerable. Structures located in the WUI are considered at a higher risk.

A GIS analysis of the identified WUI puts a total of 10,431 of the planning area’s municipal structure inventory worth \$2,347,679,000 vulnerable to and at high risk to wildland fires. Please see the table below for a breakdown of these values by jurisdiction and maps located at the end of this hazard profile for depictions of the WUI zones.

**Table 3.33 – Vulnerable Municipal Structures by Count, WUI**

| Municipality    | Ag         | Com        | Gov       | Ind       | Res          | Res-M     | Total         |
|-----------------|------------|------------|-----------|-----------|--------------|-----------|---------------|
| Uni-Douglas Co. | 90         | 263        | 13        | 68        | 7,866        | 49        | 8,349         |
| Bridgeport      | 2          | 19         | 2         | 2         | 618          | 11        | 654           |
| Coulee Dam      | 0          | 6          | 1         | 0         | 91           | 2         | 100           |
| East Wenatchee  | 10         | 89         | 5         | 19        | 908          | 8         | 1,039         |
| Mansfield       | 0          | 0          | 0         | 0         | 0            | 0         | 0             |
| Rock Island     | 2          | 11         | 1         | 1         | 273          | 1         | 289           |
| Waterville      | 0          | 0          | 0         | 0         | 0            | 0         | 0             |
| <b>Total =</b>  | <b>104</b> | <b>388</b> | <b>22</b> | <b>90</b> | <b>9,756</b> | <b>71</b> | <b>10,431</b> |

\*Multi-Unit Residential is defined as a structure with 5 or more residential units

\*\*The data are from the U.S. Census Bureau and FEMA

**Table 3.34 – Vulnerable Municipal Structures by Value, WUI**

| Municipality    | Ag                   | Com                  | Gov                 | Ind                 | Res                    | Res-M                | Total                  |
|-----------------|----------------------|----------------------|---------------------|---------------------|------------------------|----------------------|------------------------|
| Uni-Douglas Co. | \$82,648,000         | \$152,495,000        | \$7,451,000         | \$17,351,000        | \$1,502,677,000        | \$90,641,000         | \$1,853,263,000        |
| Bridgeport      | \$2,595,000          | \$9,526,000          | \$304,000           | \$513,000           | \$73,465,000           | \$15,986,000         | \$102,389,000          |
| Coulee Dam      | \$0                  | \$4,289,000          | \$755,000           | \$0                 | \$14,601,000           | \$763,000            | \$20,408,000           |
| East Wenatchee  | \$30,271,000         | \$69,551,000         | \$3,182,000         | \$5,665,000         | \$211,738,000          | \$9,430,000          | \$329,837,000          |
| Mansfield       | \$0                  | \$0                  | \$0                 | \$0                 | \$0                    | \$0                  | \$0                    |
| Rock Island     | \$689,000            | \$3,847,000          | \$451,000           | \$119,000           | \$35,567,000           | \$1,109,000          | \$41,782,000           |
| Waterville      | \$0                  | \$0                  | \$0                 | \$0                 | \$0                    | \$0                  | \$0                    |
| <b>Total =</b>  | <b>\$116,203,000</b> | <b>\$239,708,000</b> | <b>\$12,143,000</b> | <b>\$23,648,000</b> | <b>\$1,838,048,000</b> | <b>\$117,929,000</b> | <b>\$2,347,679,000</b> |

\*Multi-Unit Residential is defined as a structure with 5 or more residential units

\*\*The data are from the U.S. Census Bureau and FEMA

All of the \$202,710,700 of Eastmont School District’s structures are considered at vulnerable and at risk to wildfires. Specifically, Clovis Point Intermediate, Ulysses S. Grant Elementary, and Rock Island Elementary are located within identified WUI zones. These three sites are valued at \$44,673,400.

### ***Vulnerability of and Impact on Critical Facilities***

Of the planning area’s 50 critical facilities, all are considered vulnerable and at risk to wildfires. Of the 50, 16 are considered high risk as they are within identified WUI zones. Please see the table below for a breakdown of these facilities.

**Table 3.35 – Vulnerable Critical Facilities, WUI**

| <b>Facility</b>                          | <b>Type</b>      | <b>Owner</b> | <b>Location</b> |
|--|------------------|--------------|-----------------|
| Aging & Adult Care of Central Washington | Assisted Living  | Private      | East Wenatchee  |
| Bridgeport City Hall                     | Local Government | Bridgeport   | Bridgeport      |
| Bridgeport Fire Station                  | Fire Prevention  | Bridgeport   | Bridgeport      |
| Coulee Dam City Hall                     | Local Government | Coulee Dam   | Coulee Dam      |
| Coulee Dam Sewage Lagoon                 | Water Treatment  | Coulee Dam   | Coulee Dam      |
| Douglas County Sewage Lagoons #1         | Water Treatment  | County       | County          |
| Electrical Substation #2                 | Utility          | County       | County          |
| Electrical Substation #3                 | Utility          | County       | County          |
| Electrical Substation #4                 | Utility          | County       | County          |
| Fire District 2 - Rock Island Station 3  | Fire Prevention  | Rock Island  | Fire District 2 |
| Fire District 4 - Main Station           | Fire Prevention  | County       | Fire District 4 |
| Prestige Senior Living                   | Assisted Living  | Private      | East Wenatchee  |
| Rock Island City Clerk Office            | Local Government | Rock Island  | Rock Island     |
| Rock Island Substation                   | Utility          | Rock Island  | County          |
| Rocky Reach Substation #1                | Utility          | County       | County          |
| Rocky Reach Substation #2                | Utility          | County       | County          |

### ***Vulnerability of and Impact on Population***

An inability to properly evacuate is a population’s greatest vulnerability. They can be caught off guard due to improper warning systems and become trapped in a growing wildland fire. Douglas County and its participating jurisdictions have a population of 42,907 of which all are considered vulnerable and at risk to wildfires while 26,740 are in identified WUI zones and are considered highly vulnerable. Similarly, of the total 16,985 housing units in the planning area that are vulnerable to wildfires, 10,730 are considered highly vulnerable to wildfires. All 6,178 of Eastmont School District’s students are considered vulnerable while the 1,410 being educated at the previously mentioned school district sites are considered highly vulnerable.

**Table 3.36 – Vulnerable Municipal Populations, WUI**

| Municipality    | Population | Housing Units |
|-----------------|------------|---------------|
| Uni-Douglas Co. | 20,509     | 8,525         |
| Bridgeport      | 2,409      | 745           |
| Coulee Dam      | 187        | 94            |
| East Wenatchee  | 2,791      | 1,071         |
| Mansfield       | 0          | 0             |
| Rock Island     | 844        | 295           |
| Waterville      | 0          | 0             |
| Total =         | 26,740     | 10,730        |

*\*Multi-Unit Residential is defined as a structure with 5 or more residential units*

*\*\*The data are from the U.S. Census Bureau and FEMA*

### ***Vulnerability of and Impact on Systems***

In the event a wildfire begins to burn and grow, evacuation routes may become blocked by the fire or by other people attempting to evacuate and prevent additional resources from arriving to help response efforts. The impingement of the local transportation routes makes appropriate warning and information paramount in mitigating Douglas County and its participating jurisdictions’ systems vulnerability to wildfires. It is unlikely that any of the participating school districts or local municipal buses would become trapped by wildland fires since exceptional care will be taken to reroute these buses.

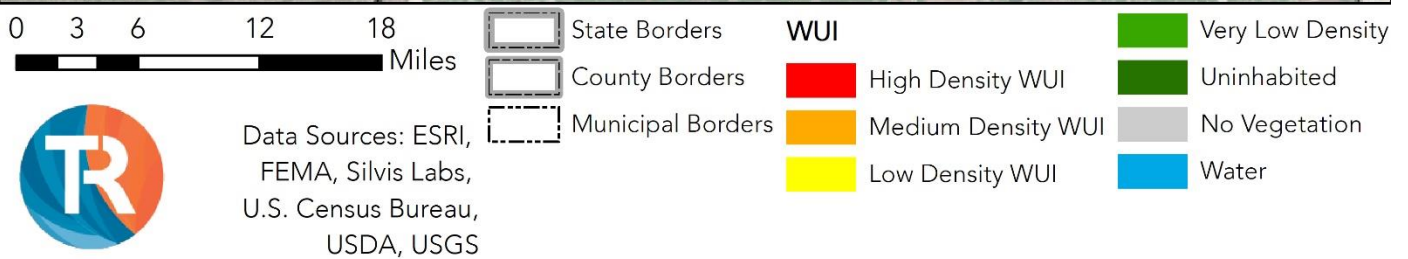
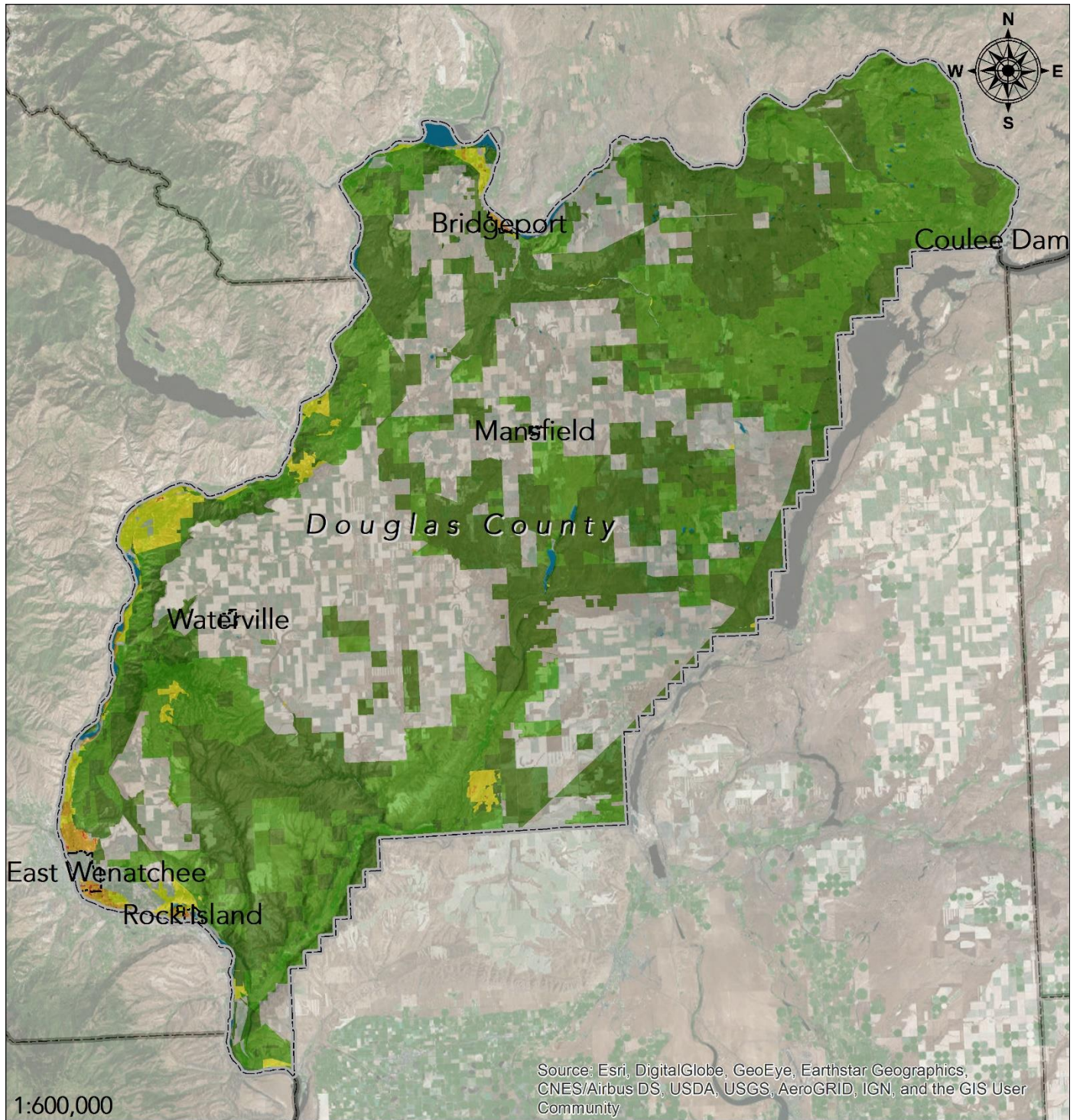
Wildfires in the planning area have the ability to burn vital energy infrastructure in rural areas and deprive residents of basic goods and services for extended periods of time. In one such incident, 13 transmission lines were destroyed.

### ***Key Considerations***

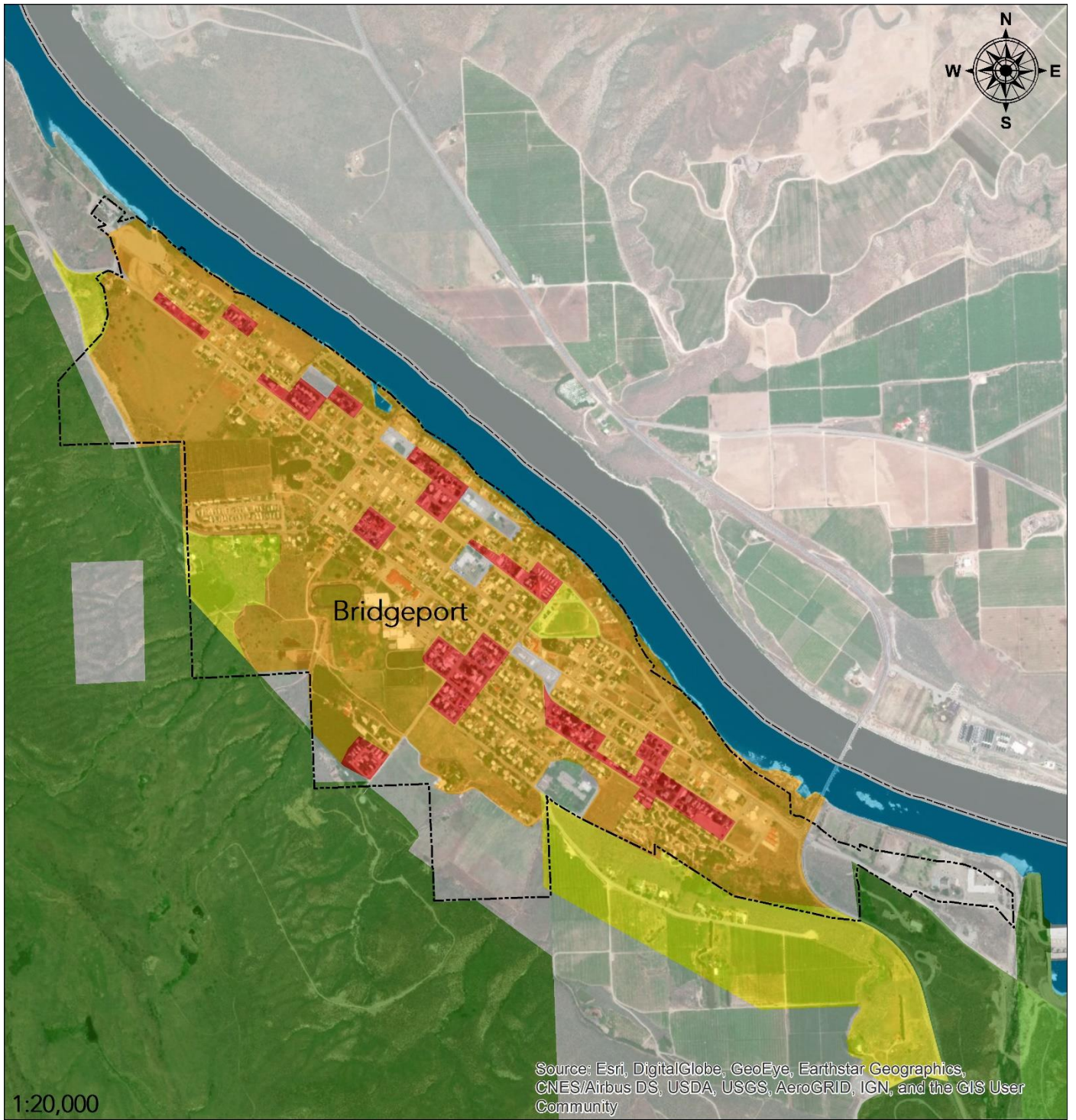
As depicted throughout this section, every jurisdiction has a small vulnerability to wildfires. In terms of identified WUI locations, all but Mansfield and Waterville are in high risk, identified WUI areas.

Unincorporated Douglas County, Bridgeport, East Wenatchee, and Rock Island have seen significant population growth since the development of their last hazard mitigation plan (Measured at greater than 5% growth). Off these communities, all have grown in identified WUI areas and thus their vulnerability and risk to wildfires has increased since their last plan was developed.

Map 3.14 – WUI, Douglas County



Map 3.15 – WUI, Bridgeport




1:20,000

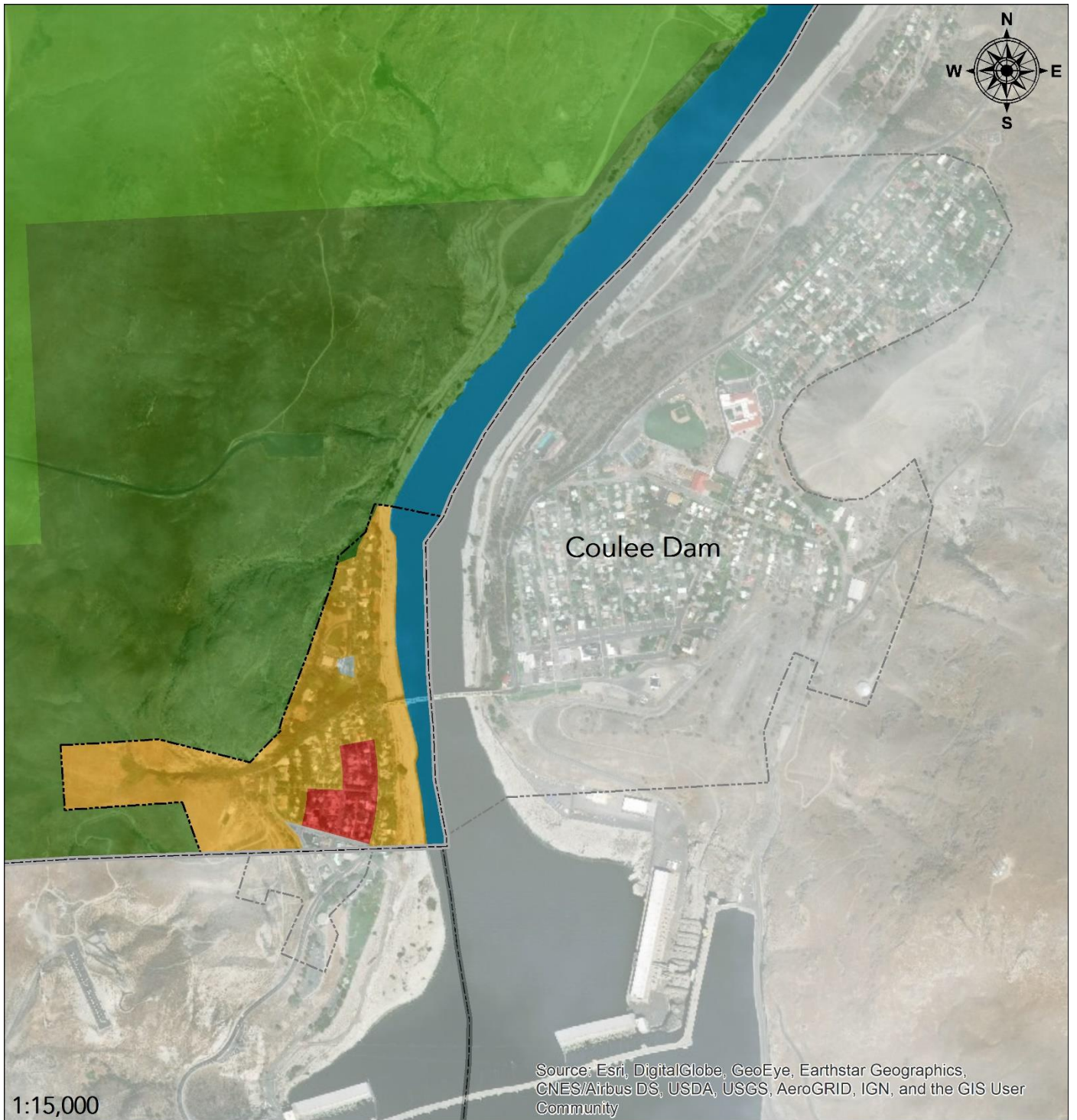
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

|                                |  |   |  |
|--------------------------------|--|---|--|
| <p>0 0.1 0.2 0.4 0.6 Miles</p> | <p>  State Borders<br/>  County Borders<br/>  Municipal Borders         </p> | <p><b>WUI</b></p> <p>  High Density WUI<br/>  Medium Density WUI<br/>  Low Density WUI         </p> | <p>  Very Low Density<br/>  Uninhabited<br/>  No Vegetation<br/>  Water         </p> |
|--------------------------------|--|---|--|

Data Sources: ESRI, FEMA, Silvis Labs, U.S. Census Bureau, USDA, USGS



Map 3.16 – WUI, Coulee Dam



1:15,000

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 0.075 0.15 0.3 0.45 Miles



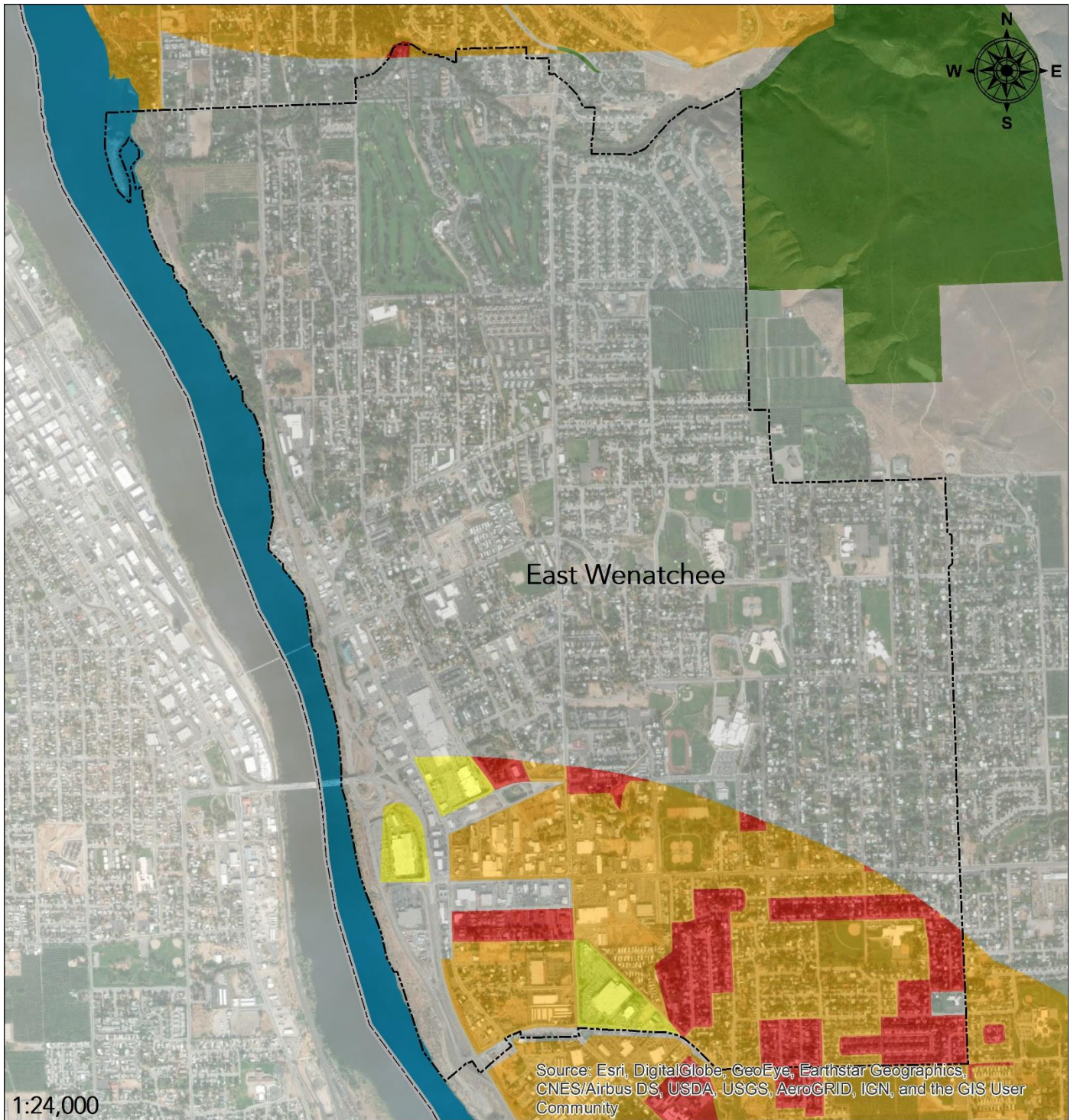
Data Sources: ESRI, FEMA, Silvis Labs, U.S. Census Bureau, USDA, USGS

-  State Borders
-  County Borders
-  Municipal Borders

- WUI**
-  High Density WUI
  -  Medium Density WUI
  -  Low Density WUI

-  Very Low Density
-  Uninhabited
-  No Vegetation
-  Water

Map 3.17 – WUI, East Wenatchee



1:24,000

0 0.125 0.25 0.5 0.75 Miles

-  State Borders
-  County Borders
-  Municipal Borders

- WUI**
-  High Density WUI
  -  Medium Density WUI
  -  Low Density WUI

-  Very Low Density
-  Uninhabited
-  No Vegetation
-  Water

Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS














Map 3.18 – WUI, Mansfield



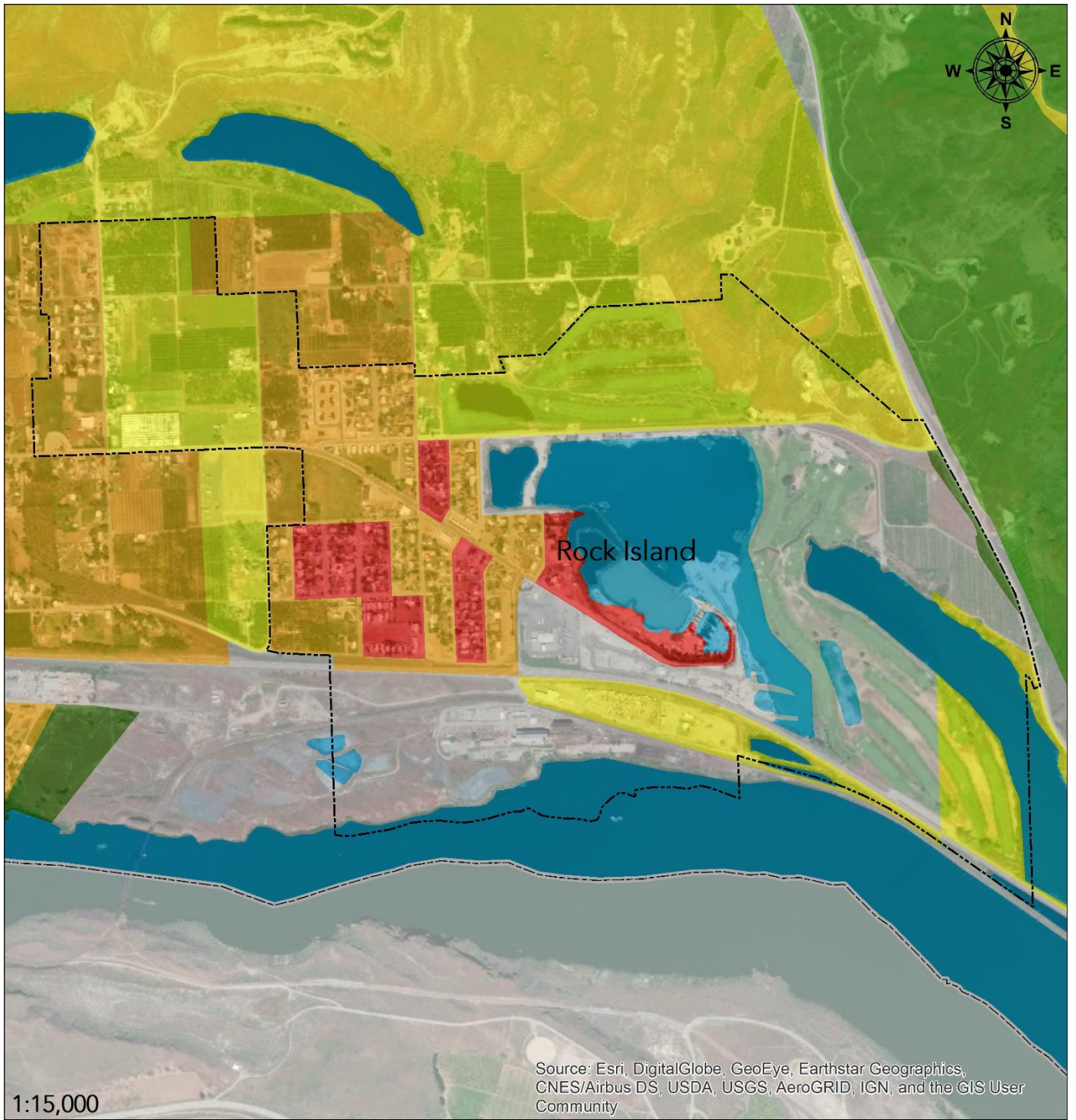
1:8,000

0 0.0425 0.085 0.17 0.255 Miles


 Data Sources: ESRI, FEMA, Silvis Labs, U.S. Census Bureau, USDA, USGS

|   |  |  |
|---|--|--|
|  State Borders     | <b>WUI</b>   |  Very Low Density |
|  County Borders    |  High Density WUI   |  Uninhabited      |
|  Municipal Borders |  Medium Density WUI |  No Vegetation    |
|   |  Low Density WUI    |  Water            |

Map 3.19 – WUI, Rock Island



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

1:15,000

0 0.075 0.15 0.3 0.45 Miles

-  State Borders
-  County Borders
-  Municipal Borders

- WUI**
-  High Density WUI
  -  Medium Density WUI
  -  Low Density WUI

-  Very Low Density
-  Uninhabited
-  No Vegetation
-  Water



Data Sources: ESRI, FEMA, Silvis Labs, U.S. Census Bureau, USDA, USGS

Map 3.20 – WUI, Waterville



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

1:12,500



-  State Borders
-  County Borders
-  Municipal Borders

- WUI**
-  High Density WUI
  -  Medium Density WUI
  -  Low Density WUI

-  Very Low Density
-  Uninhabited
-  No Vegetation
-  Water



Data Sources: ESRI, FEMA, Silvis Labs, U.S. Census Bureau, USDA, USGS

## 3.11 – Winter Storms

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A winter storm encompasses multiple effects caused by winter weather. Included ice storms, heavy or prolonged snow, sleet, and extreme temperatures.

This plan defines winter storms as a combination of the following winter weather effects as defined by NOAA and the NWS.

*Ice Storm: An ice storm is used to describe occasions when damaging accumulations of ice are expected during freezing rain situations. Significant accumulations of ice pull down trees and utility lines resulting in loss of power and communication. These accumulations of ice make walking and driving extremely dangerous. Significant ice accumulations are usually accumulations of ¼" or greater.*

*Heavy Snow: This generally means snowfall accumulating to 4" or more in depth in 12 hours or less; or snowfall accumulating to 6" or more in depth in 24 hours or less. In forecasts, snowfall amounts are expressed as a range of values, e.g., "8 to 12 inches." However, in heavy snow situations where there is considerable uncertainty concerning the range of values, more appropriate phrases are used, such as "...up to 12 inches..." or alternatively "...8 inches or more."*

*Winter Storm: Hazardous winter weather in the form of heavy snow, heavy freezing rain, or heavy sleet. May also include extremely low temperatures and increased wind.*



### **Location & Extent**

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Winter storms are an area-wide hazard as they can strike anywhere in the planning area. Winter storms can range from moderate snow over a few hours to blizzard conditions with high winds, freezing rain or sleet, heavy snowfall with blinding wind-driven snow and extremely cold temperatures that last several days.

Winter storms typically form with warning and are often anticipated. Like other large storm fronts, the severity of a storm is not as easily predicted and when it is, the window of notification is up to few hours to under an hour. Although meteorologists estimate the amount of snowfall a winter storm will drop, it is not known exactly how many feet of snow will fall, whether or not it will form an ice storm, or how powerful the winds will be until the storm is already affecting a community.

Douglas County and its participating jurisdictions will typically receive 4 inches of snow during a winter storm, but a single storm in the planning area has managed to accumulate up to a reported 8 inches in populated areas. Additionally, Douglas County and its participating jurisdictions have seen up to 0.50 inches of accumulated ice during the worst events. They should be prepared for the typical average of 0.25 inches of ice accumulation during an ice storm.

### **History & Probability**

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Since 2000, NOAA has recorded 40 winter storms in the planning area. Most ice storms have left under 0.50 inches of accumulation. Snowfall from winter storms has varied greatly ranging from just an inch to 8 inches of snow accumulation in populated areas.

These winter storms have not caused any deaths, but have been the cause of 3 serious injuries in the planning area. They have caused \$461,000 in property damage. For a complete list of NOAA recorded winter storms, please reference Appendix D.

Based on the data recorded by NOAA, the planning area should expect a winter storm at a rate of 2.11 per year.

### ***Vulnerability of and Impact on Facilities***

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Structural vulnerability to winter storms is the same throughout Douglas County and its participating jurisdictions. Heavy snow accumulation can cause roofing to collapse on old or poorly constructed facilities. Ice storms will coat a facility's exterior, but is unlikely to cause anything more than superficial damage. Prolonged, extremely cold temperatures can cause significant damage to poorly insulated or heated facilities. The cold temperatures can cause a facility's water pipes and plumbing systems to freeze. As the water in these systems turns to ice it expands and eventually will cause pipes to burst.

Douglas County and its participating jurisdictions' municipal, and school district structures are valued at a total of \$3,663,786,700. Since winter storms threaten the entire planning area equally, all municipal and school district structures are considered exposed and vulnerable.

The average winter storm in Douglas County and its participating jurisdictions costs \$11,525, while the existing range of a single incident has been from \$0 to \$250,000.

### ***Vulnerability of and Impact on Critical Facilities***

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All infrastructure and critical facilities within the planning area are equally vulnerable and at risk since winter storms can affect any portion of the planning area and damage indiscriminately.

### ***Vulnerability of and Impact on Population***

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Douglas County and its participating jurisdictions' population are equally vulnerable throughout the planning area. Douglas County and its participating jurisdictions' citizens are at risk from prolonged, cold temperatures if they fail to be sheltered in an adequately heated structure or are unable to reach shelter. Some structures are dependent on electricity or steam for their heating making them vulnerable if a winter storm causes a power outage. Additionally, if a winter storm restricts travel, people may become immobile on roadways and be at the mercy of their vehicle's fuel supply. Exposure from winter storms in any of these cases can lead to frostbite and hypothermia. Both of these conditions if untreated can lead to death.

Douglas County and its participating jurisdictions have a total population of 42,907 in 16,985 housing units all of which are vulnerable and at risk to winter storms. Additionally, the Eastmont School Districts 6,178 students and their 719 staff are considered exposed and vulnerable.

Historically, there have been 0 recorded fatalities and 3 injuries relating to winter storms across region wide fronts in Douglas County and its participating jurisdictions.

### ***Vulnerability of and Impact on Systems***

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Douglas County and its participating jurisdictions' assets and systems vulnerability to winter storms is the roughly same throughout the planning area. Winter storms create havoc on roads impacting travel from decreased speeds and traffic jams to an ice storm or blowing snow drifts making any travel impossible or extremely dangerous.

Additionally, ice storms and snow accumulation can directly bring down power lines or bring down vegetation onto power lines. One such incident brought down 13 power transmission lines, but fortunately this part of the grid was looped thus allowing power to be rerouted. From these scenarios, Douglas County and its participating jurisdictions can suffer power outages making it difficult to heat structures and exposing its citizens to prolonged cold temperatures.

Winter storms can cause a problem for school districts in lost education days and transportation to and from their schools. Winter storms can trap students and staff on roadways exposing them to hazardous conditions and cold temperature.

### ***Key Considerations***

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Winter storms have ability to affect a portion of or the entire planning area. Unfortunately, there is no way to predict ahead of time which areas will likely be more or less adversely directly affected. Further, building construction age does not necessarily have a direct correlation to vulnerability when analyzing winter storms. Older homes could have older windows and poorer insulation, but at the same time be constructed of brick or more quality construction making it difficult to arrive at a reasonable conclusion.

In regards to winter storm impacts, more rural areas of unincorporated Douglas County are less dense and rely on a more decentralized power grid. Residents of these areas stand to last without out power for a greater period of time caused by a debilitating ice storm or blizzard.

Unincorporated Douglas County, Bridgeport, East Wenatchee, and Rock Island have seen significant population growth since the development of their last hazard mitigation plan (Measured at greater than 5% growth). These communities are considered to be more vulnerable and at risk to winter storms than they were at the time their last plan was developed.

## 3.12 – Excluded Hazards

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There exists a slim chance that any type of natural hazard could occur in any location throughout the United States. However, the probability of them occurring is so infinitesimally small and their impact so slight that it is not considered reasonable to develop a fully-profiled risk assessment for them. Additionally, without historical information or data to drive an analysis, it is unlikely that their conclusions would yield functional or practical strategies to mitigate them.

The following natural hazards were profiled in the state’s latest mitigation plan but have been excluded in this plan.

### ***Avalanches***

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The Washington State Enhanced Hazard Mitigation Plan (2018) classifies Douglas County as “Medium-Low” exposure to avalanches. However, there is no discernable explanation or reasonable conclusion as to why this is the case. Douglas County has not experienced any avalanche incidents in the past, nor is there any reason to believe an avalanche event would occur within the planning area considering historical snow accumulation and its topography.

### ***Coastal Hazards***

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Douglas County is not nor is near the coastal regions of the State of Washington.

### ***Tsunami Hazards***

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According to the Washington State Enhanced Hazard Mitigation Plan (2018), Douglas County is not close enough to the coastal areas of the State of Washington to be considered at risk to Tsunamis. Additionally, studies performed by the University of Washington (Seattle) and NOAA’s Center for Tsunami Research further verify that the planning area is well outside the areas that would be impacted by a tsunami.

### ***Volcano Hazards***

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The Washington State Enhanced Hazard Mitigation Plan (2018) does not list Douglas County as exposed to the volcanic threat that runs through the Cascade mountain range.

### 3.13 – Risk Summary

The table below outlines each participating jurisdiction’s general risk to this plan’s profiled hazards. The rankings are based on a composite evaluation of this plan’s risk assessment, namely, a hazard’s probability of occurring in the future, the vulnerability of a jurisdiction to a particular hazard, the intensity of past hazard impacts, and a joint evaluation of local experts and stakeholders.

Each participating jurisdiction was assessed against each hazard on a scale of 0 to 6, 0 meaning there is no reasonable risk, 1 being the lowest level of reasonable risk, and 6 being the highest level of risk.

**Table 3.37 – Hazard Risk Summary**

| Jurisdiction       | Dam Failures | Droughts | Earthquakes | Floods | Landslides | Severe Storms | Tornadoes | Wildfires | Winter Storms |
|--------------------|--------------|----------|-------------|--------|------------|---------------|-----------|-----------|---------------|
| Uni-Douglas County | 1            | 4        | 3           | 3      | 2          | 4             | 2         | 6         | 1             |
| Bridgeport         | 2            | 2        | 2           | 3      | 0          | 3             | 1         | 5         | 1             |
| Coulee Dam         | 2            | 2        | 1           | 2      | 0          | 4             | 2         | 5         | 1             |
| East Wenatchee     | 2            | 2        | 2           | 3      | 0          | 3             | 1         | 5         | 1             |
| Mansfield          | 0            | 3        | 3           | 2      | 0          | 4             | 2         | 5         | 1             |
| Rock Island        | 0            | 2        | 2           | 2      | 2          | 3             | 1         | 5         | 1             |
| Waterville         | 0            | 3        | 3           | 2      | 0          | 4             | 2         | 5         | 1             |
| Eastmont SD        | 1            | 0        | 2           | 2      | 0          | 3             | 1         | 5         | 1             |

## Section 4 – Mitigation Strategy

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A mitigation strategy is a set of mitigation actions meant to prevent the potential impacts of hazards. There are several types of mitigation actions with a different method of reducing vulnerability.

Each jurisdiction in the planning area identified the sustained, proposed, and completed mitigation actions for each of the hazards identified as having the potential to affect the jurisdiction. For proposed mitigation actions, the planning team in each jurisdiction considered each type of mitigation action before identifying mitigation actions to include their final mitigation strategy. The mitigation strategy of each jurisdiction is included in this section of the plan.

### ***County and Municipal Governments***

The broadest form of mitigation capabilities come from the county and city governments. Article 11, Section 5 of the State of Washington Constitution defines county governments under “Commission Form.” These county commissions are authorized as the executive and legislative body of a county’s government. Their inherent legal authority allows them to institute the greatest regulatory and developmental changes such as zoning, land-use, permitting, development regulation, and any number local government functions as they see fit.

### ***School Districts***

The participating school districts have broad authority over their campuses. The necessity to protect the planning area’s children grants them greater influence and political capital to institute change.

### ***Conservation Districts***

The participating conservation districts in this plan have personnel resources and capabilities that are typically used to coordinate assistance from all available sources, public and private, local, state and federal to develop locally-driven solutions to natural resources concerns. In the planning area and for this plan, their area of expertise applies to water, soil, and vegetative resources linked to droughts and wildfire mitigation.

### ***Fire Districts***

The participating fire districts in this plan have personnel resources and capabilities that can be used in the planning and implementation of mitigation activities and projects. When collaborating with other stakeholders and municipal governments, these personnel resources can also provide subject matter expertise. Additionally, their services to the community are necessary and must be protected by mitigation measures.

### ***Douglas County Public Utility District***

The participating public utility district in this plan coordinates heavily with the local fire districts to protect their electrical transportation infrastructure in rural areas. Significant damage has been cause to their infrastructure in the past from wildfire and as such, they have maintenance personnel and staff that actively maintain debris removal programs and buffer zones in an effort to minimize the damage caused by wildfires.

## 4.1 – Mitigation Capabilities

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Each type of stakeholder provides a set of capabilities, in some cases broad and in some cases narrow, by which they can increase the planning area’s resiliency. The broadest form of mitigation capabilities come from the county and municipal governments. Their inherent legal authority allows them to institute the greatest regulatory and developmental changes.

The participating school districts have broad authority over their campuses and although budgets may be tight, they are more far reaching than some of the smaller organizations. Additionally, the necessity to protect the planning area’s children grants them greater influence and political capital to institute change.

Each special purpose district participating in the plan has a much more refined scope of operations when compared the participating municipal governments and school districts. Thus, each of their capabilities as they relate to mitigation efforts and goals are also much more specific in their scope. However, this limited scope also grants them a focus and specialization that cannot be found in the broader municipal governments or school districts.

### *Fiscal Capability*

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Douglas County and its participating jurisdictions in this mitigation plan are not unique in the issues felt by small governments to retain the staff and resources necessary to accomplish the strategies necessary to mitigate the hazards in their area. However, they are aware of potential diverse funding sources available to communities for, assisting in the fiscal needs required to implement local hazard mitigation plans, including both government and private programs.

While federal and state programs carry out the bulk of disaster relief programs that provide funds for mitigation, local governments are able to search for alternative funding sources to supplement the local hazard mitigation budget. The participants in the mitigation planning process are aware that before effective mitigation strategies can be applied, stable funding sources and effective incentives must be established on a per project basis to encourage participation by the private and public sectors.

Douglas County and its participating jurisdictions should seek out FEMA grant funding from the Pre-Disaster Mitigation Grant Program (PDM), Hazard Mitigation Grant Program (HMGP), and the Flood Mitigation Assistance Grant Program (FMA). Given the size of the municipalities involved in this plan and the pocketed areas of significant flood risk, municipal governments should have access to the United States Department of Housing and Urban Development’s Community Development Block Grant Program (CDBG) which occasionally will award grants to assist with projects that fall under hazard mitigation.

Fire Protection Districts, Conservation Districts, and Public Utility Districts have access to Fire Prevention & Safety Grants (FP&S) which are administered by FEMA to enhance safety of the public and firefighters from fire and related hazards. Additionally, many of the special purpose districts yearly

## 4.1 – Mitigation Capabilities

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budgets come from state and federal grants that have broader scopes than FEMA grants, allowing them to cross-utilize these grants for mitigation purposes.

### ***Institutional Capability***

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Douglas County as a whole community is capable of implementing the strategies identified herein. In addition, they are capable of promoting the mitigation process and educating the public about the hazards prevalent to their area, as well as mitigation process necessary to mitigate those hazards.

In an emergency, the county and each municipality's responses are an extraordinary extension of responsibility and action, coupled with normal day-to-day activity. Normal governmental duties will be maintained, with emergency operations carried out by those agencies assigned specific emergency functions.

The Eastmont School District is charged with the protection of its facilities, students, and staff. In the context of them as an institution, they are directed to implement mitigation efforts as they see fit within the confines of their internal decision-making processes.

Special purpose districts, as previously mentioned, have a more limited scope in what areas they can implement mitigation efforts. The Douglas County Public Utility District provides electricity throughout the county by way of its electrical transmission infrastructure. Its institutional capability's scope is limited to its property and infrastructure, but ultimately as a non-profit municipal corporation it has near total dominion over the implementation of mitigation efforts. Similarly, the scope of a fire protection district is well defined and the majority of their decision-making processes are internal. This also grants them a near total freedom of mitigation effort implementation only restricted by municipal laws and regulations.

The Foster Creek Conservation District on the other hand does not have dominion over property and infrastructure. Instead, it operates cooperatively as a public-private partnership and is a regulated subdivision of the Washington State Government. Its Board of Supervisors determines its direction within the scope of state guidelines and regulations. Typically, a project is proposed to the state government prior to grant funding being allocated which could potentially limit the FCCD's ability to mitigate as they see appropriate.

### ***Political Capability***

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During the process of the development of this plan, opposition to mitigation measures was not evident in Douglas County or in the participating stakeholders. The primary limiting factor is funding, which is made more difficult by the current situation in the local, state, and national economy.

The county, cities, and their partnerships with the participating agencies are well-organized and responsive to community needs. Leadership is informed and remains up-to-date on the hazards that threaten the area. Citizens who did participate in the public meetings and presentations showed an interest in doing things to promote a safer community. Therefore, the county and cities (the governing

## 4.1 – Mitigation Capabilities

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board, staff, and citizen population) appear willing to promote the economic efficiency and social utility of the mitigation measures contained in this plan, if appropriate funding can be identified. Sentiment was similar amongst the special purpose districts participating in this plan.

### ***General Authority & Regulations***

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State of Washington law provides the legal authority for local governments to implement regulatory measures. The basis for much of this authority is the local government power designed to protect public health, safety and welfare. This authority enables local government to enact and enforce ordinances, and to define and abate nuisances. Hazard mitigation is a form of protecting public health, safety, and welfare, and falls under the general regulatory powers of local government. This also extends to building codes and inspections, land use, acquisition, and floodplain development regulation.

The participating school districts and special purpose districts do not have any general authority of regulation as their operational scope and functional purposes are defined. Additionally, they lack the power to create laws and regulations. However, in certain instances such as with the fire districts, they are charged with enforcing and monitoring municipal laws and regulations.

### ***Building Codes & Inspection***

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Building codes and inspections provide local governments with the means to maintain county structures that are resilient to natural hazards. Douglas County and each of the participating municipality has adopted the 2015 International Building and Fire Prevention Code per requirements from the State of Washington. These codes prescribe minimum standards for building construction, which ensures that new buildings and structures are built to standards that are seismically sound, fire resistant and developed within flood-proofing measures. These codes also require appropriate hazard code updating and compliance when certain thresholds are met for remodel and renovation of existing buildings. These codes also authorize local governments to carry out building inspections to ensure local structures adhere to the minimum state building standards.

Municipal officials have the primary role of enforcement of the International Building Code structural regulations. Fire districts also take part in the inspection process for fire and general public safety inspections. They enforce the appropriate codes both at the plan approval stage and the site inspection stage. Douglas County and its participating jurisdictions are committed to the high standards of building provided through the respective codes, and requires that the same codes and the same enforcement procedures apply during routine permitting procedures as well as following a disaster.

### ***Land Use Planning***

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Through land use regulatory powers granted by the state, local governments can control the location, density, type and timing of land use and development in the community. Provisions of the land use plans are implemented through regulatory tools that include zoning and subdivision ordinances, and taxation. Each of the plan's participating municipalities has an adopted comprehensive plan. The FCCD

## 4.1 – Mitigation Capabilities

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can assist in land use planning as it pertains to their mission of conservation, but all participation is voluntary. They have no legal means of enforcing or monitoring the implementation of these activities.

### **Zoning**

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Within its land use planning authority, each participating local government is authorized to divide the planning area into zones. For each type of zone (as defined in a written code and by zoning maps) the local government may classify, designate, regulate, and restrict the use of buildings (land and structures) to permit the most compatible use of land within the county consistent with the needs of residential, commercial and industrial developments, and the promotion of the public health, safety, welfare and general prosperity of the county and its residents.

### **Taxation & Budgets**

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Taxation can be a powerful mitigation tool by providing local governments with a way to guide development. Tax abatements may be used to encourage landowners and developers to integrate mitigation measures into the process of building new developments and retrofitting existing properties in the floodplain. These tools can be especially effective in encouraging the mitigation of existing structures.

Additionally, school districts have the ability to levy revenue through referendums for specific projects whether it is mitigation related or not. The FCCD can raise funding through contributions and partnerships, but this number is a significantly low percentage of their mostly grant funded budgets. The Douglas County PUD funds itself through what rates it charges to its customers or the power it sells to neighboring PUDs and municipalities. It can on its own accord, raise rates to fund mitigation efforts. The fire districts' budgets come from the incorporated and unincorporated communities they service as well as state and federal grants.

### **Floodplain Programs**

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Floodplain management is the operation of a community program of measures for reducing flood damage. These measures take a variety of forms; and generally include zoning, subdivision, or building requirements, and special-purpose floodplain ordinances. Each participating jurisdiction has codified floodplain development regulations in place, although some participants may be granting special construction permits. Additionally, the State of Washington has floodplain development regulations in place to set forth minimum standards in the event a local community does not. All participating municipalities are participants in the National Flood Insurance Program (NFIP) with the exception of Mansfield and Rock Island.

Douglas County and East Wenatchee employ their own floodplain managers. Their role is to enforce NFIP, State of Washington, and other floodplain regulations within their municipal borders. In each participating municipality, development in a floodplain is restricted. This restriction is enforced through the building permit application process. When an individual or business applies for a construction permit, its location within or outside of an identified floodplain is noted and reviewed. In the case of Unincorporated Douglas County or East Wenatchee, these permits are reviewed by their

## 4.1 – Mitigation Capabilities

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floodplain managers. If the applicant is within one of the communities that does not have their own floodplain manager, they have the option to go through the review process via Douglas County's floodplain manager. In the event the proposed construction site is within an identified floodplain, the construction must be located one foot above the established base flood elevation (BFE). This is then verified by each municipality's department in charge of ordinance and code compliance. This process meets the minimum regulations set forth by the NFIP.

## 4.2 – Mitigation Goals

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The mitigation goals for Douglas County and this plan's participating jurisdictions were established based upon results from the local and state risk assessments, stakeholder meetings, and input from an extensive public survey. These goals represent Douglas County and the plan's participants' long-term vision for the continued reduction of hazard risks and the enhancement of their mitigation capabilities.

*Goal 1: Reduce the risk from natural hazard events utilizing community cooperation and an all-hazards approach.*

*Goal 2: Pursue additional, complete, and accurate data in support of mitigation planning, disaster preparedness, disaster response, and disaster recovery operations.*

*Goal 3: Integrate the hazard mitigation plan's findings into the planning, and decision-making processes for all current and future emergency management and preparedness related activities.*

*Goal 4: Minimize the risk to life and property from dam failures.*

*Goal 5: Minimize the risk to property from droughts.*

*Goal 6: Minimize the risk to life and property from earthquakes.*

*Goal 7: Minimize the risk to life and property from floods.*

*Goal 8: Minimize the risk to life and property from landslides.*

*Goal 9: Minimize the risk to life and property from severe storms.*

*Goal 10: Minimize the risk to life and property from tornadoes.*

*Goal 11: Minimize the risk to life and property from wildfires.*

*Goal 12: Minimize the risk to life and property from winter storms.*

## 4.3 – Mitigation Projects

This plan identifies a comprehensive range of 25 possible and unique mitigation projects and 3 possible and unique mitigation actions. The selected set carefully takes an all-hazards approach to mitigation while simultaneously addressing each of the individual seven profiled hazards.

The projects and actions were selected based upon their potential to reduce the risk to life and property with an emphasis on new and existing infrastructure, ease of implementation, community and agency support, consistency with local jurisdictions’ plans and capabilities, available funding, vulnerability, and total risk. For further information on evaluation criteria, please see Section 4.4. The full list of mitigation projects, their descriptions, and prioritization per jurisdiction and stakeholder can be found in Appendix F and Appendix G.

Some projects and actions mitigate risk and vulnerability to multiple hazards. Some of these projects and actions list participating jurisdictions that are only at risk from one or a few of the mitigation hazards. For example, the project: “Backup Generators” mitigates against multiple hazards. All participating jurisdictions are interested in this project, but some will not be using it to mitigate against riverine flooding. Instead they will be using it to mitigate against severe storms and winter storms.

**Table 4.1 – Mitigation Projects Summary**

| Project/Action                              | Jurisdictions  |
|---|--|
| Backup Generators                           | All Municipal Government, Eastmont SD, Fire Districts            |
| Bionets                                     | Douglas County, FCCD, Rock Island, PUD                           |
| Bury Utility Lines, Pipes, and Tanks        | All Municipal Governments, Eastmont SD, PUD                      |
| Debris & Natural Fuels Reduction            | All Municipal Government, Eastmont SD, FCCD, Fire Districts, PUD |
| Defensible Spaces & Buffer Zones            | All Municipal Government, Eastmont SD, FCCD, Fire Districts, PUD |
| Earthquake Assessment & Retrofit            | All Municipal Government, Eastmont SD, Fire Districts            |
| Elevate Structures                          | All Municipal Governments, Eastmont SD                           |
| FEMA Code 361 Safe Rooms                    | All Municipal Governments, Eastmont SD                           |
| Floodproofing                               | All Municipal Governments, Eastmont SD                           |
| Insulation & Energy Efficiency              | All Municipal Governments, Eastmont SD                           |
| Interior Furnishing Hazard Reduction        | All Municipal Government, Eastmont SD, Fire Districts            |
| Looped Grid Power Systems                   | All Municipal Governments, Eastmont SD, PUD                      |
| Low Flow Utilities                          | All Municipal Governments, FCCD                                  |
| Rainwater Retention Basins                  | All Municipal Governments, FCCD                                  |
| Raise Transportation Infrastructure         | All Municipal Governments  |
| Relocate or Buyout Vulnerable Structures    | All Municipal Governments, Eastmont SD                           |
| Slope Reinforcement & Modification          | Douglas County, FCCD, Rock Island, PUD                           |
| Snow Fences                                 | All Municipal Governments, Eastmont SD, PUD                      |
| Storm Water Drainage Upgrade                | All Municipal Governments  |
| Storm Water Pump Stations                   | All Municipal Governments  |
| Storm Siren Network Expansion               | All Municipal Governments  |
| Structural Integrity Monitoring Instruments | All Municipal Governments, Eastmont SD, Fire Districts           |
| Transportation Status & Routing Systems     | All Municipal Governments  |
| Water Line Insulation                       | All Municipal Governments, Eastmont SD                           |
| Wildfire Structural Retrofit                | All Municipal Governments, Eastmont SD, Fire Districts           |

**Table 4.2 – Mitigation Actions Summary**

| Project/Action                  | Jurisdictions  |
|---------------------------------|--|
| Dam Failure Evacuation Planning | All Municipal Government, Eastmont SD, Fire Districts, PUD       |
| Public Awareness & Education    | All Municipal Government, Eastmont SD, FCCD, Fire Districts, PUD |
| Train SKYWARN Storm Spotters    | FCCD, Fire Districts, PUD  |

**Mitigation Project Updates**

Douglas County’s prior approved mitigation plan (2010) contained suggested projects and actions that are no longer considered qualified mitigation projects or actions, rather, they classify as response, recovery, preparedness, or mere basic emergency management functions. Examples of these items include the development of basic emergency plans, risk assessments that are already part of mitigation planning, and basic municipal functions. If a project or action that was included in Douglas County’s prior plan is not listed below or listed as “carried forward” in Appendix F, it has been deleted. The table below lists the mitigation projects that have been completed or initiated since the development of their last hazard mitigation plan.

**Table 4.3 – Mitigation Project Updates**

| Mitigation Project            | Jurisdictions      | Status          | Notes                             |
|-------------------------------|--------------------|-----------------|-----------------------------------|
| Public Awareness & Education  | All Municipalities | Carried Forward |                                   |
| Rainwater Retention Basins    | All Municipalities | Completed       | Sand Canyon Environmental Project |
| Storm Siren Network Expansion | All Municipalities | Carried Forward |                                   |
| Storm Water Drainage Upgrade  | All Municipalities | Carried Forward |                                   |
| Storm Water Drainage Upgrade  | All Municipalities | Completed       | Sand Canyon Environmental Project |

## 4.4 – Project Evaluation, Implementation, & Administration

Situational changes will likely occur throughout the 5-year life cycle of a mitigation plan. This can happen due to any number of factors such as public influence, local and grant funding allotments, changing demographics, other developmental changes, and numerous more. These factors and many others have great influence over how activities and projects will need to be evaluated for feasibility and demand. Therefore, a flexible methodology will serve Douglas County and the plan participants best when determining, what, when, and where to engage an activity or project.

### *Project Evaluation*

Douglas County and this plan’s participants will utilize the STAPLE+E method of assessing mitigation actions, projects, and alternatives. Upon deciding to move forth with a mitigation project, according to decision-making process of the participating jurisdiction, the decision-making body will use the form on the following page. The evaluation will be conducted according the definitions in the table below:

**Table 4.4 – STAPLE+E**

| Category       | Concept of Analysis   |
|----------------|---|
| Social         | Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the communities’ social and cultural values.                                   |
| Technical      | Mitigation actions are technically most effective if they provide long-term reduction of losses and have minimal secondary adverse impacts.   |
| Administrative | Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.  |
| Political      | Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.   |
| Legal          | It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.  |
| Economic       | Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost-benefit review, and possible to fund.  |
| Environmental  | Sustainable mitigation actions that do not have an adverse effect on the environment, that comply with Federal, State, and local environmental regulations, and that are consistent with the community’s environmental goals, have mitigation benefits while being environmentally sound. |

- 1.) Fill in the name of the mitigation action or project followed by two other viable alternatives which address the same hazards.
- 2.) For each consideration, indicate a plus ( + ) for favorable or negative ( - ) for less favorable. If the consideration does not apply, leave it blank.
- 3.) Compare the total number of pluses and negatives to the alternative actions. Some considerations may carry more weight than others, so a simple tally does not necessarily indicate a more viable or feasible action or project.

**Table 4.5 – STAPLE+E Sample Form**

| Criteria              | Considerations                      | Action/Project | Alternative 1 | Alternative 2 |
|-----------------------|-------------------------------------|----------------|---------------|---------------|
| <b>Social</b>         | Community Acceptance                |                |               |               |
|                       | Effect on Segment of the Population |                |               |               |
| <b>Technical</b>      | Technical Feasibility               |                |               |               |
|                       | Long-Term Solution                  |                |               |               |
|                       | Secondary Impacts                   |                |               |               |
| <b>Administrative</b> | Staffing                            |                |               |               |
|                       | Funding Allocated                   |                |               |               |
|                       | Maintenance/Operations              |                |               |               |
| <b>Political</b>      | Political Support                   |                |               |               |
|                       | Local Champion                      |                |               |               |
|                       | Public Support                      |                |               |               |
| <b>Legal</b>          | State Authority                     |                |               |               |
|                       | Existing Local Authority            |                |               |               |
|                       | Political Legal Challenge           |                |               |               |
| <b>Economic</b>       | Benefit of Action                   |                |               |               |
|                       | Cost of Action                      |                |               |               |
|                       | Contributes to Economic Goals       |                |               |               |
| <b>Environmental</b>  | Effect on Land or Water             |                |               |               |
|                       | Effect on Endangered Species        |                |               |               |
|                       | Effect on HAZMAT Waste Sites        |                |               |               |
|                       | Consistent with Environmental Goals |                |               |               |
|                       | Consistent with Federal Laws        |                |               |               |
| <b>Total =</b>        |                                     |                |               |               |

### ***Project Implementation***

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Each municipal government participating in this plan has their own decision-making bodies that are free to implement the mitigation strategies found in this plan as they see fit. Each decision-making body will choose municipal departments to head up implementation efforts appropriate for that municipal department's area of responsibility.

The activity and project evaluation methodology described in this section serves as an aid for them to enhance their decision-making. It is highly suggested that the county coordinates with the other municipal governments as well as the non-municipal plan participants to work towards an organized and concentrated effort when implementing activities and projects. That is, it would better serve their implementation effectiveness to work as a whole community when deciding how to allocate staff and funding resources when implementing mitigation activities and projects.

As plan participants, the FCCD, fire protection districts, public utility district, and school districts will be in complete sole control of what, when, and where to implement mitigation activities or projects. Each has their own decision-making bodies that are free to implement as they see fit. The activity and project evaluation methodology provide earlier in this section acts as an aid for them to best apply the prescribed mitigation strategy found in this plan.

### ***Project Administration***

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Douglas County will be self-administering each project through its own government departments. The department chosen to administer a project will vary depending on the characteristics of each activity or project where as public works would be better suited for some projects while county records and risk management would be better suited for others. For each of the participating municipalities, they have the option and flexibility to administer their own activities and projects if they so choose. However, for the purpose of efficiency and governmental scale, activities and projects will default to be administered by Douglas County Risk Manager.

The FCCD, fire protection districts, public utility district, and school districts will administer activities and projects inhouse with individuals designated administrative responsibility on an ad-hoc, per project basis. Individual will be designated on a case-by-case basis as seen most fitting by the organization according to the specific characteristics of the project or activity as oversight and administration duties can vary wildly among these organizations.

## 4.5 – Planning Integration

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Mitigation doesn't end at plan approval. Plan approval is only the beginning. The successful implementation of any number mitigation activities and projects requires the coordination and collaboration of a number of local agencies, departments, and organizations. Each group has varying decision-making processes and authorities governing their actions. This plan, once approved, must be integrated into their decision-making processes as a tool for improving their respective resiliencies.

This plan is not only useful for implementing mitigation activities and projects, but is also critical in making development plans and capital improvement projects. The risk assessment in this plan can prevent unmanaged and dangerous development into identified hazard areas or other portions of the planning area that decrease a community's overall resiliency.

Although a few mitigation projects were completed in the planning area since the development of its last mitigation plan (See Section 4.3), the municipal participants in the last plan did little to integrate that plan into their planning initiatives. Even though each municipal participant has a comprehensive plan, and these plans all reference mitigation related issues, they did not reference the plan specifically. This is likely due to a few minor barriers, a few which are removed with the development of this plan.

First and foremost, the scale at which municipal planning exists in a community the size of Douglas County is a barrier in of itself. This is a limitation which is inherent in the planning area and cannot be removed. However, the continued development of hazard mitigation plans is still critical for as these communities grow in size, integration and more complex cross-function planning will become a necessity. The existence of a hazard mitigation plan will allow for a more seamless integration as the usefulness of cross-function planning grows along with the municipalities.

Secondly, the previously approved mitigation plan is dated 2010. Much of the 2010 plan was developed using 2010 or previous methodologies, methodologies which are now outdated and weren't as conducive to cross-function planning or seamless planning integration. This plan's risk assessment and mitigation strategy was developed with a more universal approach in mind. The risk assessment and provided is more detailed, incorporates enhanced GIS technologies, and a more actionable depiction of risk. Additionally, the mitigation strategy was designed to be of greater use for cross-function planning by building inherent flexibility into the strategy while maintaining, where necessary, a useful level of specificity.

Lastly, the 2010 plan did not provide functional guidelines and suggestions by the 2010 plan or parts of the 2010 plan could be integrated into local planning initiatives. It did highlight the important of planning integration and cross-function planning, but did not provide specific suggestions to the participating stakeholders.

### ***Emergency Management Planning***

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Any and all emergency management related planning will at a minimum cross reference this document during its production. In some instances, this plan or portions of it will be fully integrated depending on the circumstances and nature of the planning document.

#### ***Emergency Operations Plans***

Douglas County’s next EOP update will reflect the most probable and dangerous hazard event scenarios from the plan’s risk assessment. Additionally, the plan will be referenced in its entirety as an appendix to the EOP. This revision is the responsibility of Douglas County for all of the jurisdictions participating in this plan. Upon revision completion, all participating jurisdictions and appropriate emergency services will be notified of the revisions and sent out new copies of the EOP.

#### ***State of Washington Emergency Management Division***

WA EMD has a FEMA approved mitigation plan current as of October, 2018 and is updated every 5 years. The state’s mitigation plan is required by FEMA regulation to include a discussion and summary of local hazard mitigation plans. The process of integrating this plan is already an established process and is managed by WA EMD.

#### ***Capital Facilities Plans***

---

Both Douglas County and East Wenatchee have capital facilities plans designed to review, analyze, and combine utility and service provider’s capital facilities to establish a phasing plan to serve municipal growth. Upon the next revision of both of these plans, this hazard mitigation plan will be consulted for potential risk from the hazards addressed here.

#### ***Comprehensive Land Use Planning***

---

All participating municipal governments maintain a comprehensive land use plan. These plans detail building codes, ordinances, zoning, and other land use measures as they relate to hazard risk reduction. Upon future updates of these plans, at a minimum, this mitigation plan will be considered for serving as a base guide to updating and improving hazard risk reduction measures contained within the comprehensive land use plans for each of the participating municipalities.

#### ***Democratic Governments & Boards***

---

All the participating jurisdictions use some form of a democratic voting process. These organizations rely on agenda proposals, deliberation and discussion, and voting to solidify their decision-making.

Other than the county and East Wenatchee, the other participating municipalities engage in capital improvement, infrastructure, and other various projects on an ad hoc basis. For these stakeholders, this plan should be integrated into agenda proposal’s designs and cross-referenced during deliberation and discussion of proposed activities and projects. By using this plan’s risk assessment, development

#### 4.5 – Planning Integration

---

and capital improvement projects can be appropriately implemented taking into consideration a community's resiliency.

##### ***Foster Creek Conservation District Annual Work Plan***

---

The FCCD published an annual work plan and within this plan it addresses wildfire prevention and restoration as well as drought resiliency related work. Upon developing their next annual work plan, the FCCD will reference this hazard mitigation plan and consider the strategies herein for the 5 years following this plan's approval.

##### ***School District Strategic Improvement Plan***

---

The State of Washington Office of Superintendent of Public Instruction offers framework for school districts to develop a strategic improvement plan. This plan proposes that the Eastmont School District enhance the framework provided by the State of Washington and integrate disaster related education into this framework.

##### ***Shoreline Master Program (SMP)***

---

The Shoreline Master Program is a State of Washington sponsored set of land use policies and regulations designed to manage shoreline development. This program protects natural resources for future generations, provides for public access to water and shores, and plans for water-dependent uses. Douglas County's SMP was most recently amended in 2015.

##### ***Special Purpose Districts (Fire Districts)***

---

Douglas County's fire districts are stakeholder participants of this plan. These are considered special tax districts which are their own organizational entity, yet they must collaborate and work closely with local government to maintain operational functionality. During times of district expansion, building code enforcement and inspections, and other emergency management-related activities and projects; these fire districts should use this plan's risk assessment and mitigation strategies as a planning reference document. By incorporating this document's findings, the fire districts can better collaborate with local government and make better hazard-informed decisions as they relate to their operations.

# Appendix A – Plan Participation

## DOUGLAS COUNTY ON SOCIAL MEDIA



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The Douglas County Sheriff's Office, along with Two Rivers Emergency Management, is working to revise and update its hazard mitigation plan. The plan will assess natural hazards' risk and vulnerabilities to each community in Douglas County and provide recommendations to increase their resiliency. In doing so, these actions aim to protect property and those who live, work, and conduct business in Douglas County and its communities.

All residents, businesses, community neighbors, and other interested parties are invited to attend the plan's kick-off meeting on July 24 at 5:30 PM. The Douglas County Sheriff's Office will be hosting the meeting at The Douglas County Public Services Building, 140 19th St. NW, East Wenatchee WA.

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## Douglas County Risk Plan Update




POSTED BY: DAVE BERNSTEIN JULY 18, 2018

The Douglas County Sheriff's Office is working on the update to plans that are used to assess the risk and vulnerabilities of natural hazards and reduce the impacts to communities across Douglas County.

Douglas County Records and Risk Manager Jordyn Giulio says the county received a \$42, 000 Federal Emergency Management Agency Grant (FEMA) to fund the plan update. The consulting firm Two Rivers Emergency Management will guide the Sheriff's Office through the update. The plan will be in place by February, 2019

The public is invited to attend a kick-off meeting on July 24 at 5:30 PM. The Douglas County Sheriff's Office will be hosting the meeting at The Douglas County Public Services Building, 140 19<sup>th</sup> St. NW, East Wenatchee WA.

Giulio said a link to an online survey seeking public input will be sent later this week on social media and [the Douglas County website](#)

[← Previous post](#)   [Next post →](#)





**10** The Douglas County Empire Press • Thursday, April 11, 2019

**Legal Notices**

effective as to claims against both the decedent's probate and nonprobate assets.

Date of First Publication: March 28, 2019  
Personal Representative: Rebecca A. Dobson  
Attorney for the Personal Representative:  
Russell J. Speidel  
Address for Mailing or Service:  
Speidel Bentsen LLP  
7 North Wenatchee Avenue, Suite 600  
P.O. Box 881  
Wenatchee, WA 98807-0881

Court of Probate Proceedings and Cause Number:  
Douglas County Superior Court Cause  
No. 19-4-00008-09

REBECCA A. DOBSON  
Personal Representative

Attorneys for Personal Representative:  
SPEIDEL BENTSEN LLP

By: /s/ RUSSELL J. SPEIDEL  
WSBA No. 12838  
7 North Wenatchee Avenue, Suite 600  
P.O. Box 881  
Wenatchee, WA 98807

*Published in the Douglas County Empire Press on  
March 28, April 4 and 11, 2019.*

IN THE SUPERIOR COURT OF THE STATE OF  
WASHINGTON IN AND FOR CHELAN COUNTY

No. 19-4-00067-04

**PROBATE NOTICE TO CREDITORS  
RCW 11.40.030**

In Re the Estate of

CARL SCHILL,

Deceased.

**Legal Notices**

DATED this 20th day of March, 2019.

By: /s/Emily Finn, Administrator

*Published in the Douglas County Empire Press on  
March 28, April 4 and 11, 2019.*

**PUBLIC NOTICE**

The Draft Douglas County Hazard Mitigation Plan is now available for public review and comment. The Hazard Mitigation Plan is a strategic plan that proposes actions to reduce or eliminate long-term risk to people and property from future disasters.

During this process, citizens were asked to contribute by sharing local knowledge of the region's vulnerability to hazards based on past occurrences, as well as identify initiatives which could help reduce the level of impact of those hazards through a public survey, and two public meetings.

That process has now culminated with the development of the Draft 2019 Douglas County Hazard Mitigation Plan. Copies of the draft plan can be viewed at the Douglas County Public Services Building, 140 19th St. NW, Suite A, East Wenatchee, WA 98802.

The public is encouraged to provide input on the draft plan by mail to "Hazard Mitigation Plan Update; 140 19th St. NW, Suite A, East Wenatchee, WA 98802" or via phone at (509) 884-7173.

The comment period will run until April 22, 2019.

*Published in the Douglas County Empire Press on  
April 11 & 18, 2019.*

FOR

**BID DOCUMENT NO. 19-07-D**

**SUPPLY AND DELIVER 795 ACSR  
OVERHEAD CONDUCTOR**

The Wenatchee World, Thursday, April 11, 2019, pages from 24 to 24

One or more firms will be selected for an interview based on the following criteria categories, weighted as indicated: qualification of key personnel (2); relevant experience as demonstrated on previous projects (2); previous performance (1); expressed interest in the project (1) and Washington State Certified Minority Enterprise Participation (0.5).

Firms desiring consideration shall submit a complete proposal to the selection committee. The selection committee in evaluating the firm's proposal to the City of Bridgeport, P.O. Box 640, 1206 Columbia Ave, Bridgeport, WA 98813. Proposal packages should be submitted to arrive no later than 4:00 PM on May 10, 2019.

The most highly rated firm will be selected for negotiation of the professional service contract. The project will be partially funded through the Washington State Community Development Block Grant program with federal funds. As a result, a number of state and federal equal opportunity and affirmative action requirements will apply to the selection process and conduct of the project.

The city of Bridgeport is an equal opportunity and affirmative action employer. Minority- and women-owned firms are encouraged to submit proposals.

**LEGAL POLICY**

Legal advertisements will be published as submitted and in accordance with The Wenatchee World legal advertising format. For questions or information, please call (509) 663-5161.

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accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 U.S.C. 2000d to 2000d-4 and Title 49, Code of Federal Regulations, Department of Transportation, subtitle A, Office of the Secretary, Part 21, nondiscrimination in federally assisted programs of the Department of Transportation issued pursuant to such Act, in any office and in any manner pursuant to this order, and disadvantaged business enterprises as defined at 49 CFR Part 26 will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin or sex in consideration for an award.

DATED this 9th day of April, 2019, at Waterville, Washington.

BOARD OF COUNTY COMMISSIONERS  
 DOUGLAS COUNTY, WASHINGTON

Kyle Steinburg, Chair  
 Dan Sutton, Vice Chair  
 Marc S. Straub, Member

ATTEST: Tiana Rowland, Clerk of the Board

**Public Notice**

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The public is encouraged to provide input on the draft plan by mail to "Hazard Mitigation Plan Update; 140 19th St. NW, Suite A, East Wenatchee, WA 98802" or via phone at (509) 884-7173.

The comment period will run until April 22, 2019.

**Subcontractor Bidding Schedule**  
**Bid Package:** BP 02 - Earthwork  
 Due: 5/2/2019 @ 1:00PM  
**Bid Package:** BP 03 - Site Concrete  
 Due: 5/2/2019 @ 1:30PM  
**Bid Package:** BP 06 - Asphalt Paving  
 Due: 5/2/2019 @ 2:00PM

In accordance with RCW 39.10.380, GC/CM (General Contractor/ Construction Manager) is requesting sealed proposals from contractors for the above referenced scopes of work. The project is to add Buildings C21 (Crew Building) and C22 (Shop Building) and associated sitework to the Rock Island Facility for Chelan County PUD No. 1 and Lydig GC/CM.

Bids will be received prior to the dates and times listed above for each bid package at the offices of Public Utility No. 1 of Chelan County, Procurement and Contract Services, 327B N. Wenatchee Ave., Wenatchee, WA 98801. Proposals received after the time noted above will not be considered. Bids will be publicly opened and read aloud. The GC/CM and Owner reserve the right to reject any or all bids and to waive any irregularities or irregularities on the bids received.

No pre-bid meeting will be held. If bidders want to visit the site, please contact Marc Seaberger at Lydig Construction, [mseaberger@lydig.com](mailto:mseaberger@lydig.com) to schedule a time to walk through. This is a secure facility and site visits must be pre-arranged.

Deadline for questions is April 24, 2019 @ 2:00PM. Final Addendum will be issued no later than April 30th, 2019. Questions should be directed to [mseaberger@lydig.com](mailto:mseaberger@lydig.com). Documents may be examined at the following locations on or about April 11th, 2019:

- On-Line Plan Center - Reference documents may be accessed through Lydig's On-line Plan Center - Smartbid - the Link will be available through the company website under jobs available for bid section. <http://www.lydig.com/subcontractors-partners/>
  - Reprographic Outlet - interested parties may view online or pick up a deposit set of the Contract Drawings and additional bid package information at the following plan centers:
    - APC Document Solutions located at 2730 Occidental AVE S. Seattle WA 98134
    - Wenatchee Plan Center located at 30 N Chelan Ave. Wenatchee, WA 98801 & imaging located at 603 E 2nd Avenue, Spokane, WA 99202
- GC/CM is an equal opportunity contractor and we encourage bids from disadvantaged, minority-owned, women-owned and small businesses.

4/11/2019

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## Appendix B – Critical Facilities

| Name   | Type             | Location       | Owner            |
|--|------------------|----------------|------------------|
| Aging & Adult Care of Central Washington     | Assisted Living  | East Wenatchee | Private          |
| Amberwaves Adult Family Home                 | Assisted Living  | Waterville     | Private          |
| Bridgeport City Hall                         | Local Government | Bridgeport     | Bridgeport       |
| Bridgeport Fire Station                      | Fire Prevention  | Bridgeport     | Bridgeport       |
| Bridgeport Water Treatment Facility          | Water Treatment  | Bridgeport     | Bridgeport       |
| Cherry Lane Country Haven                    | Assisted Living  | County         | Private          |
| Chief Joseph Substation                      | Utility          | County         | County           |
| Coulee Dam City Hall                         | Local Government | Coulee Dam     | Coulee Dam       |
| Coulee Dam Sewage Lagoon                     | Water Treatment  | Coulee Dam     | Coulee Dam       |
| Douglas County Commissioners Office          | Local Government | Waterville     | County           |
| Douglas County Hospital District             | Hospital         | Waterville     | Private          |
| Douglas County Museum                        | Education        | Waterville     | County           |
| Douglas County Public Utility District       | Local Government | East Wenatchee | County           |
| Douglas County Sewage Lagoons #1             | Water Treatment  | County         | County           |
| Douglas County Sewage Treatment Plant        | Water Treatment  | East Wenatchee | County           |
| Douglas County Sewer District Office         | Local Government | East Wenatchee | County           |
| Douglas County Sheriff's Office              | Law Enforcement  | East Wenatchee | County           |
| Douglas-Okanogan Fire District 15 Station 40 | Fire Prevention  | County         | Fire District 15 |
| East Wenatchee City Hall                     | Local Government | East Wenatchee | East Wenatchee   |
| East Wenatchee Police Department             | Law Enforcement  | East Wenatchee | East Wenatchee   |
| Electrical Substation #1                     | Utility          | County         | County           |
| Electrical Substation #2                     | Utility          | County         | County           |
| Electrical Substation #3                     | Utility          | County         | County           |
| Electrical Substation #4                     | Utility          | County         | County           |
| Electrical Substation #5                     | Utility          | County         | County           |
| Fire District 1 Main Station                 | Fire Prevention  | Waterville     | Fire District 1  |
| Fire District 2 - Pangborn Station 2         | Fire Prevention  | County         | Fire District 2  |
| Fire District 2 - Rock Island Station 3      | Fire Prevention  | Rock Island    | Fire District 2  |
| Fire District 2 Main Station                 | Fire Prevention  | East Wenatchee | Fire District 2  |
| Fire District 4 Main Station                 | Fire Prevention  | County         | Fire District 4  |
| Fire District 5 Main Station                 | Fire Prevention  | Mansfield      | Fire District 5  |
| Grand Coulee Dam Power Switch Yard           | Utility          | County         | County           |
| Mansfield Airport                            | Airport          | Mansfield      | Mansfield        |
| Mansfield City Hall                          | Local Government | Mansfield      | Mansfield        |
| Mansfield Sewage Lagoons                     | Water Treatment  | County         | Mansfield        |
| Pangborn Memorial Airport                    | Airport          | County         | Private          |
| Prestige Senior Living                       | Assisted Living  | East Wenatchee | Private          |
| ResCare HomeCare                             | Assisted Living  | East Wenatchee | Private          |
| River View Airpark                           | Airport          | County         | County           |
| Rock Island City Clerk Office                | Local Government | Rock Island    | Rock Island      |
| Rock Island Substation                       | Utility          | County         | Rock Island      |
| Rocky Reach Sewage Lagoons                   | Water Treatment  | County         | County           |
| Rocky Reach Substation #1                    | Utility          | County         | County           |
| Rocky Reach Substation #2                    | Utility          | County         | County           |
| Senior Delight AFH                           | Assisted Living  | County         | Private          |
| Waterville Airport                           | Airport          | Waterville     | Waterville       |
| Waterville City Hall                         | Local Government | Waterville     | Waterville       |
| Waterville Sewage Lagoons                    | Water Treatment  | County         | Waterville       |
| Waterville Substation                        | Utility          | Waterville     | Waterville       |
| Wenatchee Assisted Living                    | Assisted Living  | East Wenatchee | Private          |

\*The data are from Douglas County

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# Appendix C – Eastmont School District

Table C.1 – Eastmont School District Facilities

| Facility                                | Construction Year | Contents Value     | Structural Value    | Total Value         |
|---|-------------------|--------------------|---------------------|---------------------|
| <b>Cascade Elementary</b>               |                   |                    |                     |                     |
| <i>Building A</i>                       | 1968              | \$227,000          | \$1,572,200         | \$1,799,200         |
| <i>Building B</i>                       | 1968              | \$227,000          | \$1,572,200         | \$1,799,200         |
| <i>Building C</i>                       | 1968              | \$204,500          | \$1,368,000         | \$1,572,500         |
| <i>Building D</i>                       | 1968              | \$352,000          | \$1,337,400         | \$1,689,400         |
| <i>Building E</i>                       | 1993              | \$163,000          | \$1,556,600         | \$1,719,600         |
| <i>Building F</i>                       | 1992              | \$103,800          | \$1,931,900         | \$2,035,700         |
| <i>Portable Classroom 702/703</i>       | 1999              | \$46,000           | \$194,300           | \$240,300           |
| <i>Portable Classroom 704</i>           | 1999              | \$23,000           | \$97,200            | \$120,200           |
| <i>Portable Classroom 705</i>           | 1999              | \$46,000           | \$194,300           | \$240,300           |
|   | <b>Total =</b>    | <b>\$1,392,300</b> | <b>\$9,824,100</b>  | <b>\$11,216,400</b> |
| <b>Clovis Point Intermediate</b>        | 2005              | <b>\$1,681,600</b> | <b>\$18,922,000</b> | <b>\$20,603,600</b> |
| <b>District Office</b>                  | 1978              | <b>\$202,000</b>   | <b>\$1,150,200</b>  | <b>\$1,352,200</b>  |
| <b>Eastmont Junior High</b>             | 2003              | <b>\$3,388,500</b> | <b>\$33,754,700</b> | <b>\$37,143,200</b> |
| <b>Eastmont Senior High</b>             |                   |                    |                     |                     |
| <i>Baseball Clubhouse</i>               | 2009              | \$10,200           | \$343,200           | \$353,400           |
| <i>Eastmont High</i>                    | 1980              | \$4,716,600        | \$54,091,000        | \$58,807,600        |
| <i>Greenhouse</i>                       | 1980              | \$4,000            | \$306,900           | \$310,900           |
| <i>Main Stadium</i>                     | 1980              | \$61,800           | \$1,092,900         | \$1,154,700         |
|   | <b>Total =</b>    | <b>\$4,792,600</b> | <b>\$55,834,000</b> | <b>\$60,626,600</b> |
| <b>Ulysses S. Grant Elementary</b>      |                   |                    |                     |                     |
| <i>Records Storage</i>                  | 1978              | \$3,000            | \$469,600           | \$472,600           |
| <i>Ulysses S. Grant Elementary</i>      | 1953              | \$1,059,000        | \$11,848,900        | \$12,907,900        |
|   | <b>Total =</b>    | <b>\$1,062,000</b> | <b>\$12,318,500</b> | <b>\$13,380,500</b> |
| <b>Kenroy Elementary</b>                |                   |                    |                     |                     |
| <i>Classrooms 101-206</i>               | 1983              | \$490,600          | \$2,976,400         | \$3,467,000         |
| <i>Classrooms 301-304</i>               | 1958              | \$147,300          | \$893,800           | \$1,041,100         |
| <i>Kenroy Elementary</i>                | 1958              | \$412,000          | \$4,180,400         | \$4,592,400         |
| <i>Portable Classroom 305/306</i>       | 1999              | \$46,000           | \$196,400           | \$242,400           |
| <i>Portable Classroom 307</i>           | 1999              | \$23,000           | \$97,200            | \$120,200           |
| <i>Portable Classroom 308</i>           | 1999              | \$23,000           | \$97,200            | \$120,200           |
| <i>Portable Classroom 309</i>           | 1999              | \$46,000           | \$194,300           | \$240,300           |
|   | <b>Total =</b>    | <b>\$1,187,900</b> | <b>\$8,635,700</b>  | <b>\$9,823,600</b>  |
| <b>Maintenance &amp; Transportation</b> |                   |                    |                     |                     |
| <i>Bus Barn</i>                         | 1988              | \$2,157,300        | \$218,600           | \$2,375,900         |
| <i>Maintenance Shop</i>                 | 1988              | \$1,230,400        | \$261,400           | \$1,491,800         |
| <i>Maintenance Warehouse</i>            | 1988              | \$451,000          | \$138,800           | \$589,800           |
| <i>Portable Office</i>                  | 1999              | \$198,400          | \$46,000            | \$244,400           |
| <i>Portable Storage</i>                 | 1990              | \$198,400          | \$28,700            | \$227,100           |
|   | <b>Total =</b>    | <b>\$4,235,500</b> | <b>\$693,500</b>    | <b>\$10,689,300</b> |
| <b>Robert E Lee Elementary</b>          |                   |                    |                     |                     |
| <i>Portable Classroom P1</i>            | 1999              | \$23,000           | \$97,200            | \$120,200           |
| <i>Portable Classroom P2</i>            | 1999              | \$23,000           | \$97,200            | \$120,200           |
| <i>Portable Classroom P3/P4</i>         | 1999              | \$46,000           | \$194,300           | \$240,300           |
| <i>Portable Classroom P5</i>            | 1999              | \$23,000           | \$97,200            | \$120,200           |
| <i>Portable Classroom P6</i>            | 1999              | \$23,000           | \$97,200            | \$120,200           |
| <i>Robert E Lee Elementary</i>          | 1956              | \$584,400          | \$6,081,200         | \$6,665,600         |
|   | <b>Total =</b>    | <b>\$722,400</b>   | <b>\$6,664,300</b>  | <b>\$7,386,700</b>  |

Appendix C – Eastmont School District

|                                     |                      |                     |                      |                      |
|-------------------------------------|----------------------|---------------------|----------------------|----------------------|
| Rock Island Elementary              | 1937                 | \$890,300           | \$9,799,000          | \$10,689,300         |
| <b>Sterling Intermediate School</b> |                      |                     |                      |                      |
| Sterling Intermediate               | 1961                 | \$1,794,300         | \$21,080,200         | \$22,874,500         |
| Ag Farm Building                    | 2001                 | \$150,000           | \$32,200             | \$182,200            |
| Portable Classroom P1               | 1999                 | \$17,300            | \$97,200             | \$114,500            |
| Portable Classroom P2/P3            | 1999                 | \$34,500            | \$194,300            | \$228,800            |
| Portable Classroom P4/P5            | 1999                 | \$34,500            | \$194,300            | \$228,800            |
| Portable Classroom P6/P8            | 1999                 | \$34,500            | \$194,300            | \$228,800            |
| Portable Classroom P7               | 1999                 | \$17,300            | \$97,200             | \$114,500            |
| Portable Classroom P9               | 1999                 | \$17,300            | \$97,200             | \$114,500            |
| Portable Classroom P10              | 1999                 | \$17,300            | \$97,200             | \$114,500            |
| Portable Classroom P11              | 1999                 | \$17,300            | \$97,200             | \$114,500            |
| Portable Classroom P12              | 1999                 | \$17,300            | \$97,200             | \$114,500            |
| Portable Classroom P13              | 1999                 | \$17,300            | \$97,200             | \$114,500            |
|                                     | <b>Total =</b>       | <b>\$2,168,900</b>  | <b>\$22,375,700</b>  | <b>\$24,544,600</b>  |
| Technology Services                 | 1971                 | \$203,600           | \$811,400            | \$1,015,000          |
|                                     | <b>Grant Total =</b> | <b>\$21,927,600</b> | <b>\$180,783,100</b> | <b>\$202,710,700</b> |

\*The data are from the Eastmont School District

# Appendix D – NOAA/NWS Records

Table D.1 – Drought Records

| Drought Week | Drought Level (Planning Area Percentage) |       |       |    |    |
|--------------|--|-------|-------|----|----|
|              | D0                                       | D1    | D2    | D3 | D4 |
| 8/29/2000    | 0.88                                     | 0     | 0     | 0  | 0  |
| 9/5/2000     | 0.23                                     | 0     | 0     | 0  | 0  |
| 1/23/2001    | 100                                      | 0     | 0     | 0  | 0  |
| 1/30/2001    | 100                                      | 0     | 0     | 0  | 0  |
| 2/6/2001     | 100                                      | 0     | 0     | 0  | 0  |
| 2/13/2001    | 100                                      | 100   | 0     | 0  | 0  |
| 2/20/2001    | 100                                      | 100   | 0     | 0  | 0  |
| 2/27/2001    | 100                                      | 100   | 0     | 0  | 0  |
| 3/6/2001     | 100                                      | 100   | 0     | 0  | 0  |
| 3/13/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 3/20/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 3/27/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 4/3/2001     | 100                                      | 100   | 100   | 0  | 0  |
| 4/10/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 4/17/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 4/24/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 5/1/2001     | 100                                      | 100   | 100   | 0  | 0  |
| 5/8/2001     | 100                                      | 100   | 100   | 0  | 0  |
| 5/15/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 5/22/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 5/29/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 6/5/2001     | 100                                      | 100   | 100   | 0  | 0  |
| 6/12/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 6/19/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 6/26/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 7/3/2001     | 100                                      | 100   | 100   | 0  | 0  |
| 7/10/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 7/17/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 7/24/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 7/31/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 8/7/2001     | 100                                      | 100   | 100   | 0  | 0  |
| 8/14/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 8/21/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 8/28/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 9/4/2001     | 100                                      | 100   | 100   | 0  | 0  |
| 9/11/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 9/18/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 9/25/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 10/2/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 10/9/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 10/16/2001   | 100                                      | 100   | 100   | 0  | 0  |
| 10/23/2001   | 100                                      | 100   | 100   | 0  | 0  |
| 10/30/2001   | 100                                      | 100   | 100   | 0  | 0  |
| 11/6/2001    | 100                                      | 100   | 100   | 0  | 0  |
| 11/13/2001   | 100                                      | 100   | 100   | 0  | 0  |
| 11/20/2001   | 100                                      | 100   | 100   | 0  | 0  |
| 11/27/2001   | 100                                      | 100   | 100   | 0  | 0  |
| 12/4/2001    | 100                                      | 100   | 90.09 | 0  | 0  |
| 12/11/2001   | 100                                      | 100   | 90.09 | 0  | 0  |
| 12/18/2001   | 100                                      | 100   | 90.08 | 0  | 0  |
| 12/25/2001   | 100                                      | 100   | 90.09 | 0  | 0  |
| 1/1/2002     | 100                                      | 100   | 93.11 | 0  | 0  |
| 1/8/2002     | 100                                      | 0     | 0     | 0  | 0  |
| 1/15/2002    | 100                                      | 0     | 0     | 0  | 0  |
| 1/22/2002    | 100                                      | 0     | 0     | 0  | 0  |
| 1/29/2002    | 89.25                                    | 0     | 0     | 0  | 0  |
| 2/5/2002     | 82.83                                    | 0     | 0     | 0  | 0  |
| 8/13/2002    | 38.62                                    | 0     | 0     | 0  | 0  |
| 8/20/2002    | 45.51                                    | 0     | 0     | 0  | 0  |
| 8/27/2002    | 48.27                                    | 0     | 0     | 0  | 0  |
| 9/3/2002     | 43.69                                    | 0     | 0     | 0  | 0  |
| 9/10/2002    | 95.36                                    | 0     | 0     | 0  | 0  |
| 9/17/2002    | 100                                      | 0     | 0     | 0  | 0  |
| 9/24/2002    | 100                                      | 0     | 0     | 0  | 0  |
| 10/1/2002    | 100                                      | 0     | 0     | 0  | 0  |
| 10/8/2002    | 100                                      | 0     | 0     | 0  | 0  |
| 10/15/2002   | 100                                      | 0     | 0     | 0  | 0  |
| 10/22/2002   | 100                                      | 0     | 0     | 0  | 0  |
| 10/29/2002   | 100                                      | 0     | 0     | 0  | 0  |
| 11/5/2002    | 100                                      | 2     | 0     | 0  | 0  |
| 11/12/2002   | 100                                      | 7.57  | 0     | 0  | 0  |
| 11/19/2002   | 100                                      | 17.77 | 0     | 0  | 0  |

## Appendix D – NOAA/NWS Records

|            |       |       |      |   |   |
|------------|-------|-------|------|---|---|
| 11/26/2002 | 100   | 15.87 | 0    | 0 | 0 |
| 12/3/2002  | 100   | 4.61  | 0    | 0 | 0 |
| 12/10/2002 | 100   | 3.43  | 0    | 0 | 0 |
| 12/17/2002 | 100   | 7.13  | 0    | 0 | 0 |
| 12/24/2002 | 100   | 13.48 | 0    | 0 | 0 |
| 12/31/2002 | 100   | 0     | 0    | 0 | 0 |
| 1/7/2003   | 96.57 | 0     | 0    | 0 | 0 |
| 1/14/2003  | 88.89 | 0     | 0    | 0 | 0 |
| 1/21/2003  | 94.29 | 0     | 0    | 0 | 0 |
| 1/28/2003  | 97.65 | 0     | 0    | 0 | 0 |
| 2/4/2003   | 100   | 0     | 0    | 0 | 0 |
| 2/11/2003  | 100   | 0     | 0    | 0 | 0 |
| 2/18/2003  | 100   | 0     | 0    | 0 | 0 |
| 2/25/2003  | 100   | 0     | 0    | 0 | 0 |
| 3/4/2003   | 100   | 0     | 0    | 0 | 0 |
| 3/11/2003  | 100   | 0     | 0    | 0 | 0 |
| 7/1/2003   | 100   | 0     | 0    | 0 | 0 |
| 7/8/2003   | 100   | 0     | 0    | 0 | 0 |
| 7/15/2003  | 100   | 0     | 0    | 0 | 0 |
| 7/22/2003  | 100   | 0     | 0    | 0 | 0 |
| 7/29/2003  | 100   | 100   | 0    | 0 | 0 |
| 8/5/2003   | 100   | 100   | 0    | 0 | 0 |
| 8/12/2003  | 100   | 100   | 0    | 0 | 0 |
| 8/19/2003  | 100   | 100   | 0    | 0 | 0 |
| 8/26/2003  | 100   | 100   | 0    | 0 | 0 |
| 9/2/2003   | 100   | 100   | 0    | 0 | 0 |
| 9/9/2003   | 100   | 100   | 0    | 0 | 0 |
| 9/16/2003  | 100   | 100   | 0    | 0 | 0 |
| 9/23/2003  | 100   | 100   | 0    | 0 | 0 |
| 9/30/2003  | 100   | 100   | 0    | 0 | 0 |
| 10/7/2003  | 100   | 100   | 0.62 | 0 | 0 |
| 10/14/2003 | 100   | 100   | 0    | 0 | 0 |
| 10/21/2003 | 100   | 97.21 | 0    | 0 | 0 |
| 10/28/2003 | 100   | 92.54 | 0    | 0 | 0 |
| 11/4/2003  | 100   | 98.44 | 0    | 0 | 0 |
| 11/11/2003 | 100   | 93.36 | 0    | 0 | 0 |
| 11/18/2003 | 100   | 95.54 | 0    | 0 | 0 |
| 11/25/2003 | 92.13 | 38.06 | 0    | 0 | 0 |
| 12/2/2003  | 94.56 | 33.81 | 0.01 | 0 | 0 |
| 12/9/2003  | 80.93 | 23.42 | 0    | 0 | 0 |
| 12/16/2003 | 68.35 | 35.6  | 0    | 0 | 0 |
| 12/23/2003 | 64.91 | 26.07 | 0    | 0 | 0 |
| 12/30/2003 | 73.93 | 32.78 | 0    | 0 | 0 |
| 1/6/2004   | 83.4  | 31.06 | 0    | 0 | 0 |
| 1/13/2004  | 99.11 | 1.68  | 0    | 0 | 0 |
| 1/20/2004  | 88.44 | 0     | 0    | 0 | 0 |
| 1/27/2004  | 82.65 | 0     | 0    | 0 | 0 |
| 2/3/2004   | 82.65 | 0     | 0    | 0 | 0 |
| 2/10/2004  | 82.65 | 0     | 0    | 0 | 0 |
| 2/17/2004  | 82.65 | 0     | 0    | 0 | 0 |
| 2/24/2004  | 82.65 | 0     | 0    | 0 | 0 |
| 3/2/2004   | 81.82 | 0     | 0    | 0 | 0 |
| 3/9/2004   | 81.82 | 0     | 0    | 0 | 0 |
| 3/16/2004  | 81.82 | 0     | 0    | 0 | 0 |
| 3/23/2004  | 81.82 | 0     | 0    | 0 | 0 |
| 3/30/2004  | 81.82 | 0     | 0    | 0 | 0 |
| 4/6/2004   | 79.6  | 0     | 0    | 0 | 0 |
| 4/13/2004  | 79.6  | 0     | 0    | 0 | 0 |
| 4/20/2004  | 79.6  | 0     | 0    | 0 | 0 |
| 4/27/2004  | 79.6  | 0     | 0    | 0 | 0 |
| 5/4/2004   | 79.6  | 0     | 0    | 0 | 0 |
| 5/11/2004  | 77.67 | 0     | 0    | 0 | 0 |
| 5/18/2004  | 77.67 | 0     | 0    | 0 | 0 |
| 5/25/2004  | 77.67 | 0     | 0    | 0 | 0 |
| 6/1/2004   | 64.38 | 1.19  | 0    | 0 | 0 |
| 6/8/2004   | 88.27 | 0.77  | 0    | 0 | 0 |
| 6/15/2004  | 88.27 | 0.77  | 0    | 0 | 0 |
| 6/22/2004  | 86.21 | 1.24  | 0    | 0 | 0 |
| 6/29/2004  | 100   | 11.65 | 0    | 0 | 0 |
| 7/6/2004   | 100   | 90.38 | 0    | 0 | 0 |
| 7/13/2004  | 100   | 90.38 | 0    | 0 | 0 |
| 7/20/2004  | 100   | 92.17 | 0    | 0 | 0 |
| 7/27/2004  | 100   | 90.38 | 0    | 0 | 0 |
| 8/3/2004   | 100   | 90.38 | 0    | 0 | 0 |
| 8/10/2004  | 100   | 89.64 | 0    | 0 | 0 |
| 8/17/2004  | 100   | 89.64 | 0    | 0 | 0 |
| 8/24/2004  | 100   | 89.64 | 0    | 0 | 0 |
| 8/31/2004  | 88.44 | 0     | 0    | 0 | 0 |
| 9/7/2004   | 84.89 | 0     | 0    | 0 | 0 |

## Appendix D – NOAA/NWS Records

|            |       |      |       |       |   |
|------------|-------|------|-------|-------|---|
| 9/14/2004  | 78.39 | 0    | 0     | 0     | 0 |
| 9/21/2004  | 79.26 | 0    | 0     | 0     | 0 |
| 9/28/2004  | 77.79 | 0    | 0     | 0     | 0 |
| 10/5/2004  | 77.79 | 0    | 0     | 0     | 0 |
| 10/12/2004 | 77.79 | 0    | 0     | 0     | 0 |
| 10/19/2004 | 77.79 | 0    | 0     | 0     | 0 |
| 10/26/2004 | 77.79 | 0    | 0     | 0     | 0 |
| 11/2/2004  | 77.52 | 0    | 0     | 0     | 0 |
| 11/9/2004  | 77.52 | 0    | 0     | 0     | 0 |
| 11/16/2004 | 77.52 | 0    | 0     | 0     | 0 |
| 11/23/2004 | 100   | 0    | 0     | 0     | 0 |
| 11/30/2004 | 100   | 0    | 0     | 0     | 0 |
| 12/7/2004  | 100   | 0    | 0     | 0     | 0 |
| 12/14/2004 | 93.87 | 0    | 0     | 0     | 0 |
| 12/21/2004 | 96.87 | 0    | 0     | 0     | 0 |
| 12/28/2004 | 98.1  | 0    | 0     | 0     | 0 |
| 1/4/2005   | 98.1  | 0    | 0     | 0     | 0 |
| 1/11/2005  | 100   | 0    | 0     | 0     | 0 |
| 1/18/2005  | 100   | 0    | 0     | 0     | 0 |
| 1/25/2005  | 100   | 0    | 0     | 0     | 0 |
| 2/1/2005   | 100   | 100  | 0     | 0     | 0 |
| 2/8/2005   | 100   | 100  | 0     | 0     | 0 |
| 2/15/2005  | 100   | 100  | 0     | 0     | 0 |
| 2/22/2005  | 100   | 100  | 4.34  | 0     | 0 |
| 3/1/2005   | 100   | 100  | 4.34  | 0     | 0 |
| 3/8/2005   | 100   | 100  | 81.07 | 0     | 0 |
| 3/15/2005  | 100   | 100  | 81.07 | 0     | 0 |
| 3/22/2005  | 100   | 100  | 81.07 | 0     | 0 |
| 3/29/2005  | 100   | 100  | 81.07 | 0     | 0 |
| 4/5/2005   | 100   | 100  | 100   | 0     | 0 |
| 4/12/2005  | 100   | 100  | 100   | 0     | 0 |
| 4/19/2005  | 100   | 100  | 100   | 2.63  | 0 |
| 4/26/2005  | 100   | 100  | 100   | 2.63  | 0 |
| 5/3/2005   | 100   | 100  | 100   | 2.63  | 0 |
| 5/10/2005  | 100   | 100  | 100   | 2.63  | 0 |
| 5/17/2005  | 100   | 100  | 97.46 | 0     | 0 |
| 5/24/2005  | 100   | 100  | 97.46 | 0     | 0 |
| 5/31/2005  | 100   | 100  | 97.46 | 0     | 0 |
| 6/7/2005   | 100   | 100  | 98.29 | 0     | 0 |
| 6/14/2005  | 100   | 100  | 98.29 | 0     | 0 |
| 6/21/2005  | 100   | 100  | 100   | 0     | 0 |
| 6/28/2005  | 100   | 100  | 100   | 0     | 0 |
| 7/5/2005   | 100   | 100  | 100   | 0     | 0 |
| 7/12/2005  | 100   | 100  | 99.97 | 0     | 0 |
| 7/19/2005  | 100   | 100  | 99.97 | 0     | 0 |
| 7/26/2005  | 100   | 100  | 99.97 | 0     | 0 |
| 8/2/2005   | 100   | 100  | 99.97 | 0     | 0 |
| 8/9/2005   | 100   | 100  | 99.97 | 0     | 0 |
| 8/16/2005  | 100   | 100  | 99.97 | 0     | 0 |
| 8/23/2005  | 100   | 100  | 99.97 | 0     | 0 |
| 8/30/2005  | 100   | 100  | 99.97 | 0     | 0 |
| 9/6/2005   | 100   | 100  | 99.97 | 0     | 0 |
| 9/13/2005  | 100   | 100  | 99.97 | 0     | 0 |
| 9/20/2005  | 100   | 100  | 99.97 | 18.52 | 0 |
| 9/27/2005  | 100   | 100  | 99.97 | 18.52 | 0 |
| 10/4/2005  | 100   | 100  | 99.97 | 4.72  | 0 |
| 10/11/2005 | 100   | 100  | 99.97 | 4.72  | 0 |
| 10/18/2005 | 100   | 100  | 99.97 | 0     | 0 |
| 10/25/2005 | 100   | 100  | 99.97 | 0     | 0 |
| 11/1/2005  | 100   | 100  | 99.97 | 0     | 0 |
| 11/8/2005  | 100   | 100  | 99.97 | 0     | 0 |
| 11/15/2005 | 100   | 100  | 99.95 | 0     | 0 |
| 11/22/2005 | 100   | 100  | 99.95 | 0     | 0 |
| 11/29/2005 | 100   | 100  | 99.95 | 0     | 0 |
| 12/6/2005  | 100   | 100  | 82.86 | 0     | 0 |
| 12/13/2005 | 100   | 100  | 82.86 | 0     | 0 |
| 12/20/2005 | 100   | 100  | 82.86 | 0     | 0 |
| 12/27/2005 | 100   | 100  | 78.52 | 0     | 0 |
| 1/3/2006   | 100   | 98.6 | 0     | 0     | 0 |
| 1/10/2006  | 100   | 0    | 0     | 0     | 0 |
| 8/29/2006  | 100   | 0    | 0     | 0     | 0 |
| 9/5/2006   | 100   | 0    | 0     | 0     | 0 |
| 9/12/2006  | 100   | 0    | 0     | 0     | 0 |
| 9/19/2006  | 100   | 0    | 0     | 0     | 0 |
| 9/26/2006  | 100   | 0    | 0     | 0     | 0 |
| 10/3/2006  | 100   | 0    | 0     | 0     | 0 |
| 10/10/2006 | 100   | 0    | 0     | 0     | 0 |
| 10/17/2006 | 100   | 0    | 0     | 0     | 0 |
| 10/24/2006 | 100   | 0    | 0     | 0     | 0 |

## Appendix D – NOAA/NWS Records

|            |       |       |   |   |   |
|------------|-------|-------|---|---|---|
| 10/31/2006 | 100   | 0     | 0 | 0 | 0 |
| 7/10/2007  | 100   | 0     | 0 | 0 | 0 |
| 7/17/2007  | 100   | 0     | 0 | 0 | 0 |
| 7/24/2007  | 88.75 | 0     | 0 | 0 | 0 |
| 7/31/2007  | 88.75 | 0     | 0 | 0 | 0 |
| 8/7/2007   | 88.75 | 0     | 0 | 0 | 0 |
| 8/14/2007  | 88.75 | 0     | 0 | 0 | 0 |
| 8/21/2007  | 88.75 | 0     | 0 | 0 | 0 |
| 8/28/2007  | 87.34 | 0     | 0 | 0 | 0 |
| 9/4/2007   | 87.34 | 0     | 0 | 0 | 0 |
| 9/11/2007  | 87.34 | 0     | 0 | 0 | 0 |
| 9/18/2007  | 100   | 0     | 0 | 0 | 0 |
| 9/25/2007  | 100   | 0     | 0 | 0 | 0 |
| 10/2/2007  | 100   | 0     | 0 | 0 | 0 |
| 10/9/2007  | 100   | 0     | 0 | 0 | 0 |
| 10/16/2007 | 100   | 0     | 0 | 0 | 0 |
| 10/23/2007 | 67.48 | 0     | 0 | 0 | 0 |
| 10/30/2007 | 67.48 | 0     | 0 | 0 | 0 |
| 11/6/2007  | 67.48 | 0     | 0 | 0 | 0 |
| 11/13/2007 | 67.48 | 0     | 0 | 0 | 0 |
| 11/20/2007 | 67.48 | 0     | 0 | 0 | 0 |
| 11/27/2007 | 67.48 | 0     | 0 | 0 | 0 |
| 6/3/2008   | 100   | 0     | 0 | 0 | 0 |
| 6/10/2008  | 100   | 0     | 0 | 0 | 0 |
| 6/17/2008  | 100   | 0     | 0 | 0 | 0 |
| 6/24/2008  | 100   | 0     | 0 | 0 | 0 |
| 7/1/2008   | 100   | 0     | 0 | 0 | 0 |
| 7/8/2008   | 100   | 0     | 0 | 0 | 0 |
| 7/15/2008  | 100   | 23.89 | 0 | 0 | 0 |
| 7/22/2008  | 100   | 23.89 | 0 | 0 | 0 |
| 7/29/2008  | 100   | 23.89 | 0 | 0 | 0 |
| 8/5/2008   | 100   | 23.89 | 0 | 0 | 0 |
| 8/12/2008  | 99.93 | 23.89 | 0 | 0 | 0 |
| 8/19/2008  | 99.84 | 23.89 | 0 | 0 | 0 |
| 8/26/2008  | 99.84 | 23.89 | 0 | 0 | 0 |
| 9/2/2008   | 99.96 | 23.87 | 0 | 0 | 0 |
| 9/9/2008   | 99.96 | 23.87 | 0 | 0 | 0 |
| 9/16/2008  | 99.93 | 23.87 | 0 | 0 | 0 |
| 9/23/2008  | 99.93 | 23.87 | 0 | 0 | 0 |
| 9/30/2008  | 99.93 | 23.87 | 0 | 0 | 0 |
| 10/7/2008  | 99.93 | 23.87 | 0 | 0 | 0 |
| 10/14/2008 | 99.78 | 23.87 | 0 | 0 | 0 |
| 10/21/2008 | 99.36 | 31.85 | 0 | 0 | 0 |
| 10/28/2008 | 100   | 30.02 | 0 | 0 | 0 |
| 11/4/2008  | 100   | 30.02 | 0 | 0 | 0 |
| 11/11/2008 | 100   | 0     | 0 | 0 | 0 |
| 11/18/2008 | 100   | 0     | 0 | 0 | 0 |
| 11/25/2008 | 100   | 0     | 0 | 0 | 0 |
| 12/2/2008  | 100   | 0     | 0 | 0 | 0 |
| 12/9/2008  | 100   | 0     | 0 | 0 | 0 |
| 12/16/2008 | 100   | 0     | 0 | 0 | 0 |
| 12/23/2008 | 100   | 0     | 0 | 0 | 0 |
| 12/30/2008 | 100   | 0     | 0 | 0 | 0 |
| 1/6/2009   | 100   | 0     | 0 | 0 | 0 |
| 1/13/2009  | 100   | 0     | 0 | 0 | 0 |
| 1/20/2009  | 98.06 | 0     | 0 | 0 | 0 |
| 1/27/2009  | 98.96 | 0     | 0 | 0 | 0 |
| 2/3/2009   | 99.15 | 0     | 0 | 0 | 0 |
| 2/10/2009  | 99.15 | 0     | 0 | 0 | 0 |
| 2/17/2009  | 100   | 0     | 0 | 0 | 0 |
| 2/24/2009  | 100   | 0     | 0 | 0 | 0 |
| 3/3/2009   | 100   | 0     | 0 | 0 | 0 |
| 3/10/2009  | 100   | 65.25 | 0 | 0 | 0 |
| 3/17/2009  | 100   | 65.25 | 0 | 0 | 0 |
| 3/24/2009  | 100   | 65.25 | 0 | 0 | 0 |
| 3/31/2009  | 100   | 65.25 | 0 | 0 | 0 |
| 4/7/2009   | 100   | 65.25 | 0 | 0 | 0 |
| 4/14/2009  | 100   | 65.25 | 0 | 0 | 0 |
| 4/21/2009  | 100   | 65.25 | 0 | 0 | 0 |
| 4/28/2009  | 100   | 65.25 | 0 | 0 | 0 |
| 5/5/2009   | 100   | 65.25 | 0 | 0 | 0 |
| 5/12/2009  | 100   | 65.25 | 0 | 0 | 0 |
| 5/19/2009  | 100   | 65.25 | 0 | 0 | 0 |
| 5/26/2009  | 100   | 65.25 | 0 | 0 | 0 |
| 6/2/2009   | 100   | 65.25 | 0 | 0 | 0 |
| 6/9/2009   | 100   | 65.25 | 0 | 0 | 0 |
| 6/16/2009  | 100   | 80.74 | 0 | 0 | 0 |
| 6/23/2009  | 100   | 80.74 | 0 | 0 | 0 |
| 6/30/2009  | 100   | 80.74 | 0 | 0 | 0 |

## Appendix D – NOAA/NWS Records

|            |       |       |       |   |   |
|------------|-------|-------|-------|---|---|
| 7/7/2009   | 100   | 100   | 0     | 0 | 0 |
| 7/14/2009  | 100   | 100   | 0     | 0 | 0 |
| 7/21/2009  | 100   | 100   | 0     | 0 | 0 |
| 7/28/2009  | 100   | 100   | 0     | 0 | 0 |
| 8/4/2009   | 100   | 100   | 94.33 | 0 | 0 |
| 8/11/2009  | 100   | 100   | 94.33 | 0 | 0 |
| 8/18/2009  | 100   | 100   | 94.35 | 0 | 0 |
| 8/25/2009  | 100   | 100   | 94.35 | 0 | 0 |
| 9/1/2009   | 100   | 100   | 94.35 | 0 | 0 |
| 9/8/2009   | 100   | 100   | 94.35 | 0 | 0 |
| 9/15/2009  | 100   | 100   | 94.35 | 0 | 0 |
| 9/22/2009  | 100   | 100   | 94.35 | 0 | 0 |
| 9/29/2009  | 100   | 100   | 94.35 | 0 | 0 |
| 10/6/2009  | 100   | 100   | 94.35 | 0 | 0 |
| 10/13/2009 | 100   | 100   | 94.35 | 0 | 0 |
| 10/20/2009 | 100   | 100   | 91.45 | 0 | 0 |
| 10/27/2009 | 100   | 100   | 91.45 | 0 | 0 |
| 11/3/2009  | 100   | 100   | 91.45 | 0 | 0 |
| 11/10/2009 | 100   | 100   | 91.45 | 0 | 0 |
| 11/17/2009 | 100   | 100   | 91.45 | 0 | 0 |
| 11/24/2009 | 100   | 100   | 91.45 | 0 | 0 |
| 12/1/2009  | 100   | 100   | 91.45 | 0 | 0 |
| 12/8/2009  | 100   | 100   | 91.45 | 0 | 0 |
| 12/15/2009 | 100   | 100   | 91.45 | 0 | 0 |
| 12/22/2009 | 100   | 100   | 91.45 | 0 | 0 |
| 12/29/2009 | 100   | 100   | 91.45 | 0 | 0 |
| 1/5/2010   | 100   | 100   | 91.45 | 0 | 0 |
| 1/12/2010  | 100   | 100   | 91.45 | 0 | 0 |
| 1/19/2010  | 100   | 100   | 91.44 | 0 | 0 |
| 1/26/2010  | 100   | 100   | 91.44 | 0 | 0 |
| 2/2/2010   | 100   | 100   | 92.44 | 0 | 0 |
| 2/9/2010   | 100   | 100   | 92.44 | 0 | 0 |
| 2/16/2010  | 100   | 100   | 92.44 | 0 | 0 |
| 2/23/2010  | 100   | 100   | 92.44 | 0 | 0 |
| 3/2/2010   | 100   | 99.85 | 78.15 | 0 | 0 |
| 3/9/2010   | 100   | 75.3  | 0     | 0 | 0 |
| 3/16/2010  | 100   | 75.3  | 0     | 0 | 0 |
| 3/23/2010  | 100   | 48.89 | 0     | 0 | 0 |
| 3/30/2010  | 100   | 48.89 | 0     | 0 | 0 |
| 4/6/2010   | 100   | 48.89 | 0     | 0 | 0 |
| 4/13/2010  | 100   | 48.89 | 0     | 0 | 0 |
| 4/20/2010  | 100   | 48.89 | 0     | 0 | 0 |
| 4/27/2010  | 100   | 48.89 | 0     | 0 | 0 |
| 5/4/2010   | 100   | 48.89 | 0     | 0 | 0 |
| 5/11/2010  | 100   | 48.89 | 0     | 0 | 0 |
| 5/18/2010  | 100   | 48.89 | 0     | 0 | 0 |
| 5/25/2010  | 100   | 48.89 | 0     | 0 | 0 |
| 6/1/2010   | 100   | 0     | 0     | 0 | 0 |
| 3/1/2011   | 31.52 | 0     | 0     | 0 | 0 |
| 3/8/2011   | 31.52 | 0     | 0     | 0 | 0 |
| 3/15/2011  | 31.52 | 0     | 0     | 0 | 0 |
| 11/29/2011 | 0.55  | 0     | 0     | 0 | 0 |
| 12/6/2011  | 1.68  | 0     | 0     | 0 | 0 |
| 12/13/2011 | 1.68  | 0     | 0     | 0 | 0 |
| 12/20/2011 | 1.68  | 0     | 0     | 0 | 0 |
| 12/27/2011 | 79.28 | 0     | 0     | 0 | 0 |
| 1/3/2012   | 99.85 | 0     | 0     | 0 | 0 |
| 1/10/2012  | 99.85 | 65.4  | 0     | 0 | 0 |
| 1/17/2012  | 99.85 | 65.4  | 0     | 0 | 0 |
| 1/24/2012  | 99.85 | 62.83 | 0     | 0 | 0 |
| 1/31/2012  | 99.85 | 62.83 | 0     | 0 | 0 |
| 2/7/2012   | 99.85 | 62.83 | 0     | 0 | 0 |
| 2/14/2012  | 99.85 | 62.83 | 0     | 0 | 0 |
| 2/21/2012  | 99.85 | 62.83 | 0     | 0 | 0 |
| 2/28/2012  | 99.85 | 62.83 | 0     | 0 | 0 |
| 3/6/2012   | 99.85 | 62.83 | 0     | 0 | 0 |
| 3/13/2012  | 99.85 | 62.83 | 0     | 0 | 0 |
| 3/20/2012  | 97.39 | 11.83 | 0     | 0 | 0 |
| 3/27/2012  | 97.16 | 11.83 | 0     | 0 | 0 |
| 4/3/2012   | 97.16 | 11.83 | 0     | 0 | 0 |
| 4/10/2012  | 97.16 | 11.83 | 0     | 0 | 0 |
| 4/17/2012  | 97.16 | 11.83 | 0     | 0 | 0 |
| 4/24/2012  | 97.16 | 11.83 | 0     | 0 | 0 |
| 5/1/2012   | 97.16 | 11.83 | 0     | 0 | 0 |
| 5/8/2012   | 96.93 | 7.64  | 0     | 0 | 0 |
| 5/15/2012  | 96.93 | 7.64  | 0     | 0 | 0 |
| 5/22/2012  | 96.93 | 7.64  | 0     | 0 | 0 |
| 5/29/2012  | 96.93 | 7.64  | 0     | 0 | 0 |
| 6/5/2012   | 96.93 | 7.64  | 0     | 0 | 0 |

## Appendix D – NOAA/NWS Records

|            |       |       |       |   |   |
|------------|-------|-------|-------|---|---|
| 6/12/2012  | 99.33 | 7.64  | 0     | 0 | 0 |
| 6/19/2012  | 99.33 | 7.64  | 0     | 0 | 0 |
| 6/26/2012  | 99.33 | 7.64  | 0     | 0 | 0 |
| 7/3/2012   | 99.33 | 7.63  | 0     | 0 | 0 |
| 7/10/2012  | 99.33 | 7.63  | 0     | 0 | 0 |
| 7/17/2012  | 8.1   | 0     | 0     | 0 | 0 |
| 7/24/2012  | 8.1   | 0     | 0     | 0 | 0 |
| 7/31/2012  | 8.1   | 0     | 0     | 0 | 0 |
| 8/7/2012   | 8.1   | 0     | 0     | 0 | 0 |
| 8/14/2012  | 8.1   | 0     | 0     | 0 | 0 |
| 8/21/2012  | 8.1   | 0     | 0     | 0 | 0 |
| 8/28/2012  | 8.1   | 0     | 0     | 0 | 0 |
| 9/4/2012   | 8.1   | 0     | 0     | 0 | 0 |
| 9/11/2012  | 8.1   | 0     | 0     | 0 | 0 |
| 7/16/2013  | 23.85 | 0     | 0     | 0 | 0 |
| 7/23/2013  | 23.85 | 0     | 0     | 0 | 0 |
| 7/30/2013  | 23.85 | 0     | 0     | 0 | 0 |
| 8/6/2013   | 23.85 | 0     | 0     | 0 | 0 |
| 8/13/2013  | 23.85 | 0     | 0     | 0 | 0 |
| 12/3/2013  | 74.19 | 0     | 0     | 0 | 0 |
| 12/10/2013 | 74.19 | 0     | 0     | 0 | 0 |
| 12/17/2013 | 100   | 0     | 0     | 0 | 0 |
| 12/24/2013 | 100   | 0     | 0     | 0 | 0 |
| 12/31/2013 | 100   | 0     | 0     | 0 | 0 |
| 1/7/2014   | 100   | 11.19 | 0     | 0 | 0 |
| 1/14/2014  | 100   | 100   | 0     | 0 | 0 |
| 1/21/2014  | 100   | 100   | 0     | 0 | 0 |
| 1/28/2014  | 100   | 100   | 0     | 0 | 0 |
| 2/4/2014   | 100   | 100   | 0     | 0 | 0 |
| 2/11/2014  | 100   | 100   | 49.31 | 0 | 0 |
| 2/18/2014  | 100   | 100   | 49.31 | 0 | 0 |
| 2/25/2014  | 100   | 100   | 49.31 | 0 | 0 |
| 3/4/2014   | 100   | 100   | 86.92 | 0 | 0 |
| 3/11/2014  | 100   | 100   | 86.92 | 0 | 0 |
| 3/18/2014  | 100   | 100   | 86.92 | 0 | 0 |
| 3/25/2014  | 100   | 100   | 79.17 | 0 | 0 |
| 4/1/2014   | 100   | 100   | 79.17 | 0 | 0 |
| 4/8/2014   | 100   | 100   | 79.17 | 0 | 0 |
| 4/15/2014  | 100   | 100   | 79.17 | 0 | 0 |
| 4/22/2014  | 100   | 100   | 79.17 | 0 | 0 |
| 4/29/2014  | 100   | 100   | 79.17 | 0 | 0 |
| 5/6/2014   | 100   | 100   | 79.17 | 0 | 0 |
| 5/13/2014  | 100   | 100   | 79.17 | 0 | 0 |
| 5/20/2014  | 100   | 100   | 79.17 | 0 | 0 |
| 5/27/2014  | 100   | 100   | 79.17 | 0 | 0 |
| 6/3/2014   | 100   | 100   | 79.17 | 0 | 0 |
| 6/10/2014  | 100   | 100   | 79.17 | 0 | 0 |
| 6/17/2014  | 100   | 100   | 79.17 | 0 | 0 |
| 6/24/2014  | 100   | 100   | 99.32 | 0 | 0 |
| 7/1/2014   | 100   | 100   | 99.32 | 0 | 0 |
| 7/8/2014   | 100   | 100   | 99.32 | 0 | 0 |
| 7/15/2014  | 100   | 100   | 99.32 | 0 | 0 |
| 7/22/2014  | 100   | 100   | 99.32 | 0 | 0 |
| 7/29/2014  | 100   | 100   | 99.32 | 0 | 0 |
| 8/5/2014   | 100   | 100   | 100   | 0 | 0 |
| 8/12/2014  | 100   | 100   | 100   | 0 | 0 |
| 8/19/2014  | 100   | 100   | 100   | 0 | 0 |
| 8/26/2014  | 100   | 100   | 100   | 0 | 0 |
| 9/2/2014   | 100   | 100   | 100   | 0 | 0 |
| 9/9/2014   | 100   | 100   | 100   | 0 | 0 |
| 9/16/2014  | 100   | 100   | 100   | 0 | 0 |
| 9/23/2014  | 100   | 100   | 100   | 0 | 0 |
| 9/30/2014  | 100   | 100   | 100   | 0 | 0 |
| 10/7/2014  | 100   | 100   | 100   | 0 | 0 |
| 10/14/2014 | 100   | 100   | 100   | 0 | 0 |
| 10/21/2014 | 100   | 100   | 100   | 0 | 0 |
| 10/28/2014 | 100   | 100   | 100   | 0 | 0 |
| 11/4/2014  | 100   | 100   | 88.76 | 0 | 0 |
| 11/11/2014 | 100   | 100   | 88.76 | 0 | 0 |
| 11/18/2014 | 100   | 100   | 88.76 | 0 | 0 |
| 11/25/2014 | 100   | 100   | 88.76 | 0 | 0 |
| 12/2/2014  | 100   | 100   | 89.02 | 0 | 0 |
| 12/9/2014  | 100   | 100   | 89.02 | 0 | 0 |
| 12/16/2014 | 100   | 100   | 75.3  | 0 | 0 |
| 12/23/2014 | 100   | 100   | 75.3  | 0 | 0 |
| 12/30/2014 | 100   | 100   | 75.3  | 0 | 0 |
| 1/6/2015   | 100   | 100   | 29.88 | 0 | 0 |
| 1/13/2015  | 100   | 74.62 | 0.83  | 0 | 0 |
| 1/20/2015  | 100   | 76.13 | 0.83  | 0 | 0 |

Appendix D – NOAA/NWS Records

|            |       |       |       |       |   |
|------------|-------|-------|-------|-------|---|
| 1/27/2015  | 100   | 5.88  | 0     | 0     | 0 |
| 2/3/2015   | 100   | 5.88  | 0     | 0     | 0 |
| 2/10/2015  | 100   | 0     | 0     | 0     | 0 |
| 2/17/2015  | 21.05 | 0     | 0     | 0     | 0 |
| 2/24/2015  | 21.05 | 0     | 0     | 0     | 0 |
| 3/3/2015   | 21.05 | 0     | 0     | 0     | 0 |
| 3/10/2015  | 21.05 | 0     | 0     | 0     | 0 |
| 3/17/2015  | 21.05 | 0     | 0     | 0     | 0 |
| 3/24/2015  | 21.81 | 0     | 0     | 0     | 0 |
| 3/31/2015  | 21.81 | 0     | 0     | 0     | 0 |
| 4/7/2015   | 21.81 | 0     | 0     | 0     | 0 |
| 4/14/2015  | 22.35 | 0     | 0     | 0     | 0 |
| 4/21/2015  | 22.35 | 0     | 0     | 0     | 0 |
| 4/28/2015  | 23.7  | 0     | 0     | 0     | 0 |
| 5/5/2015   | 23.7  | 5.14  | 0     | 0     | 0 |
| 5/12/2015  | 23.7  | 5.14  | 0     | 0     | 0 |
| 5/19/2015  | 23.7  | 5.14  | 0     | 0     | 0 |
| 5/26/2015  | 23.7  | 5.14  | 0     | 0     | 0 |
| 6/2/2015   | 23.7  | 5.14  | 0     | 0     | 0 |
| 6/9/2015   | 23.7  | 5.14  | 0     | 0     | 0 |
| 6/16/2015  | 23.7  | 5.14  | 0     | 0     | 0 |
| 6/23/2015  | 100   | 23.7  | 0     | 0     | 0 |
| 6/30/2015  | 100   | 25.88 | 0     | 0     | 0 |
| 7/7/2015   | 100   | 100   | 25.93 | 0     | 0 |
| 7/14/2015  | 100   | 100   | 100   | 0     | 0 |
| 7/21/2015  | 100   | 100   | 100   | 0     | 0 |
| 7/28/2015  | 100   | 100   | 100   | 0.19  | 0 |
| 8/4/2015   | 100   | 100   | 100   | 0.19  | 0 |
| 8/11/2015  | 100   | 100   | 100   | 0.19  | 0 |
| 8/18/2015  | 100   | 100   | 100   | 29.38 | 0 |
| 8/25/2015  | 100   | 100   | 100   | 100   | 0 |
| 9/1/2015   | 100   | 100   | 100   | 100   | 0 |
| 9/8/2015   | 100   | 100   | 100   | 100   | 0 |
| 9/15/2015  | 100   | 100   | 100   | 100   | 0 |
| 9/22/2015  | 100   | 100   | 100   | 100   | 0 |
| 9/29/2015  | 100   | 100   | 100   | 100   | 0 |
| 10/6/2015  | 100   | 100   | 100   | 100   | 0 |
| 10/13/2015 | 100   | 100   | 100   | 100   | 0 |
| 10/20/2015 | 100   | 100   | 100   | 100   | 0 |
| 10/27/2015 | 100   | 100   | 100   | 100   | 0 |
| 11/3/2015  | 100   | 100   | 100   | 100   | 0 |
| 11/10/2015 | 100   | 100   | 100   | 100   | 0 |
| 11/17/2015 | 100   | 100   | 100   | 100   | 0 |
| 11/24/2015 | 100   | 100   | 100   | 100   | 0 |
| 12/1/2015  | 100   | 100   | 100   | 100   | 0 |
| 12/8/2015  | 100   | 100   | 100   | 69.24 | 0 |
| 12/15/2015 | 100   | 100   | 62.21 | 0     | 0 |
| 12/22/2015 | 100   | 77.08 | 15.7  | 0     | 0 |
| 12/29/2015 | 76.84 | 15.69 | 0     | 0     | 0 |
| 1/5/2016   | 76.84 | 15.69 | 0     | 0     | 0 |
| 1/12/2016  | 75.91 | 15.69 | 0     | 0     | 0 |
| 1/19/2016  | 75.91 | 15.69 | 0     | 0     | 0 |
| 1/26/2016  | 26.53 | 0     | 0     | 0     | 0 |
| 2/2/2016   | 26.53 | 0     | 0     | 0     | 0 |
| 2/9/2016   | 26.53 | 0     | 0     | 0     | 0 |
| 2/16/2016  | 26.53 | 0     | 0     | 0     | 0 |
| 6/7/2016   | 100   | 0     | 0     | 0     | 0 |
| 6/14/2016  | 100   | 0     | 0     | 0     | 0 |
| 6/21/2016  | 100   | 0     | 0     | 0     | 0 |
| 6/28/2016  | 100   | 0     | 0     | 0     | 0 |
| 7/5/2016   | 100   | 0     | 0     | 0     | 0 |
| 7/12/2016  | 100   | 0     | 0     | 0     | 0 |
| 7/19/2016  | 100   | 0     | 0     | 0     | 0 |
| 7/26/2016  | 100   | 0     | 0     | 0     | 0 |
| 8/2/2016   | 100   | 0     | 0     | 0     | 0 |
| 8/9/2016   | 100   | 0     | 0     | 0     | 0 |
| 8/16/2016  | 100   | 0     | 0     | 0     | 0 |
| 8/23/2016  | 100   | 0     | 0     | 0     | 0 |
| 8/30/2016  | 100   | 0     | 0     | 0     | 0 |
| 9/6/2016   | 100   | 0     | 0     | 0     | 0 |
| 9/13/2016  | 100   | 0     | 0     | 0     | 0 |
| 9/20/2016  | 100   | 0     | 0     | 0     | 0 |
| 9/27/2016  | 100   | 0     | 0     | 0     | 0 |
| 10/4/2016  | 100   | 0     | 0     | 0     | 0 |
| 10/11/2016 | 100   | 0     | 0     | 0     | 0 |
| 7/18/2017  | 22.61 | 0     | 0     | 0     | 0 |
| 7/25/2017  | 22.61 | 0     | 0     | 0     | 0 |
| 8/1/2017   | 99.56 | 0     | 0     | 0     | 0 |
| 8/8/2017   | 100   | 0     | 0     | 0     | 0 |

## Appendix D – NOAA/NWS Records

|            |       |       |   |   |   |
|------------|-------|-------|---|---|---|
| 8/15/2017  | 100   | 0     | 0 | 0 | 0 |
| 8/22/2017  | 100   | 0     | 0 | 0 | 0 |
| 8/29/2017  | 100   | 0     | 0 | 0 | 0 |
| 9/5/2017   | 100   | 0     | 0 | 0 | 0 |
| 9/12/2017  | 100   | 30.54 | 0 | 0 | 0 |
| 9/19/2017  | 100   | 30.54 | 0 | 0 | 0 |
| 9/26/2017  | 100   | 30.54 | 0 | 0 | 0 |
| 10/3/2017  | 100   | 30.54 | 0 | 0 | 0 |
| 10/10/2017 | 100   | 30.54 | 0 | 0 | 0 |
| 10/17/2017 | 100   | 30.28 | 0 | 0 | 0 |
| 10/24/2017 | 100   | 30.62 | 0 | 0 | 0 |
| 10/31/2017 | 100   | 30.62 | 0 | 0 | 0 |
| 11/7/2017  | 100   | 28.06 | 0 | 0 | 0 |
| 11/14/2017 | 60.73 | 0     | 0 | 0 | 0 |
| 3/6/2018   | 0.66  | 0     | 0 | 0 | 0 |
| 3/13/2018  | 0.66  | 0     | 0 | 0 | 0 |
| 3/20/2018  | 0.66  | 0     | 0 | 0 | 0 |
| 7/17/2018  | 100   | 0     | 0 | 0 | 0 |
| 7/24/2018  | 100   | 0     | 0 | 0 | 0 |
| 7/31/2018  | 100   | 0     | 0 | 0 | 0 |
| 8/7/2018   | 100   | 0     | 0 | 0 | 0 |
| 8/14/2018  | 100   | 0     | 0 | 0 | 0 |
| 8/21/2018  | 100   | 0     | 0 | 0 | 0 |
| 8/28/2018  | 100   | 0     | 0 | 0 | 0 |
| 9/4/2018   | 100   | 0     | 0 | 0 | 0 |
| 9/11/2018  | 100   | 0     | 0 | 0 | 0 |
| 9/18/2018  | 100   | 0     | 0 | 0 | 0 |
| 9/25/2018  | 100   | 0     | 0 | 0 | 0 |
| 10/2/2018  | 100   | 0     | 0 | 0 | 0 |
| 10/9/2018  | 100   | 0     | 0 | 0 | 0 |
| 10/16/2018 | 100   | 0     | 0 | 0 | 0 |
| 10/23/2018 | 100   | 0     | 0 | 0 | 0 |
| 10/30/2018 | 100   | 0     | 0 | 0 | 0 |
| 11/6/2018  | 100   | 0     | 0 | 0 | 0 |
| 11/13/2018 | 100   | 0     | 0 | 0 | 0 |
| 11/20/2018 | 100   | 0     | 0 | 0 | 0 |
| 11/27/2018 | 100   | 0     | 0 | 0 | 0 |
| 12/4/2018  | 100   | 0     | 0 | 0 | 0 |
| 12/11/2018 | 100   | 0     | 0 | 0 | 0 |
| 12/18/2018 | 100   | 0     | 0 | 0 | 0 |
| 12/25/2018 | 100   | 0     | 0 | 0 | 0 |

\*The data are from the US Drought Monitor.

### Table D.2 – Flash Flood Records

| Location    | Event Date | Injuries | Deaths | Property Damage |
|-------------|------------|----------|--------|-----------------|
| Waterville  | 7/31/2010  | 0        | 0      | \$40,000        |
| Mc Carteney | 9/5/2013   | 0        | 0      | \$20,000        |
| Waterville  | 6/29/2015  | 0        | 0      | 0               |
| Totals =    |            | 0        | 0      | \$60,000        |

\*The data are from the NOAA NCDC Storm Events Database

### Table D.3 – Hail Records

| Location           | Event Date | Size (Inches) | Injuries | Deaths | Property Damage | Crop Damage |
|--------------------|------------|---------------|----------|--------|-----------------|-------------|
| East Wenatchee     | 5/19/2004  | 0.75          | 0        | 0      | \$0             | \$0         |
| Mansfield          | 5/20/2004  | 1             | 0        | 0      | \$0             | \$0         |
| Orondo             | 7/5/2006   | 1             | 0        | 0      | \$0             | \$5,920,000 |
| Leahy              | 7/1/2008   | 1.5           | 0        | 0      | \$0             | \$0         |
| Waterville Airport | 7/31/2010  | 0.88          | 0        | 0      | \$0             | \$20,000    |
| Lamoine            | 7/31/2010  | 0.88          | 0        | 0      | \$0             | \$20,000    |
| St. Andrews        | 7/17/2013  | 1             | 0        | 0      | \$0             | \$0         |
| Countywide         | 6/29/2015  | 0.88          | 0        | 0      | \$0             | \$0         |
| Totals =           |            |               | 0        | 0      | \$0             | \$5,960,000 |

\*The data are from the NOAA NCDC Storm Events Database.

Table D.4 – High Wind Records

| Location   | Event Date | Wind Speed (MPH) | Injuries | Deaths | Property Damage |
|--|------------|------------------|----------|--------|-----------------|
| Northeast Mountains (Zone)   | 4/20/1997  | 62               | 0        | 0      | \$0             |
| Ne Grant/X Ne Douglas/X Se Okanogan/Lincoln X Ne/Adams X Sw (Zone) | 2/2/1999   | -                | 0        | 0      | \$250,000       |
| Douglas X Extreme W&N Parts/Nw Grant (Zone)                        | 9/25/1999  | -                | 0        | 0      | \$5,000         |
| Ne Grant/X Ne Douglas/X Se Okanogan/Lincoln X Ne/Adams X Sw (Zone) | 9/25/1999  | -                | 0        | 0      | \$5,000         |
| E Chelan/Extreme W Douglas (Zone)                                  | 9/25/1999  | -                | 0        | 0      | \$5,000         |
| Upper Columbia Basin (Zone)  | 1/9/2000   | 69               | 0        | 0      | \$0             |
| Waterville Plateau (Zone)  | 1/9/2000   | 69               | 0        | 0      | \$0             |
| Wenatchee Area (Zone)  | 1/9/2000   | 69               | 0        | 0      | \$0             |
| Ne Grant/X Ne Douglas/X Se Okanogan/Lincoln X Ne/Adams X Sw (Zone) | 12/16/2001 | -                | 0        | 0      | \$15,000        |
| E Chelan/Extreme W Douglas (Zone)                                  | 1/20/2002  | 53               | 0        | 0      | \$40,000        |
| Douglas X Extreme W&N Parts/Nw Grant (Zone)                        | 1/20/2002  | 76               | 0        | 0      | \$0             |
| Okanogan Valley (Zone)   | 4/22/2002  | 77               | 0        | 0      | \$5,000         |
| Waterville Plateau (Zone)  | 4/22/2002  | 40               | 0        | 0      | \$3,000         |
| Nc&S Okanogan X Extreme Se Part/Extreme N Douglas (Zone)           | 8/16/2002  | 77               | 0        | 0      | \$300,000       |
| Wenatchee Area (Zone)  | 3/5/2003   | 58               | 0        | 0      | \$0             |
| Okanogan Valley (Zone)   | 9/11/2003  | 82               | 0        | 0      | \$0             |
| Upper Columbia Basin (Zone)  | 10/28/2003 | 52               | 0        | 0      | \$0             |
| Okanogan Valley (Zone)   | 10/28/2003 | 108              | 0        | 0      | \$0             |
| Waterville Plateau (Zone)  | 10/28/2003 | 68               | 0        | 0      | \$0             |
| E Chelan/Extreme W Douglas (Zone)                                  | 11/16/2003 | 69               | 0        | 0      | \$0             |
| Ne Grant/X Ne Douglas/X Se Okanogan/Lincoln X Ne/Adams X Sw (Zone) | 11/18/2003 | 69               | 0        | 0      | \$8,000         |
| Wenatchee Area (Zone)  | 1/30/2004  | 58               | 0        | 0      | \$1,000         |
| Okanogan Valley (Zone)   | 4/27/2004  | 81               | 0        | 0      | \$0             |
| Douglas X Extreme W&N Parts/Nw Grant (Zone)                        | 12/19/2004 | 69               | 0        | 0      | \$0             |
| E Chelan/Extreme W Douglas (Zone)                                  | 3/16/2005  | 69               | 0        | 0      | \$0             |
| Nc&S Okanogan X Extreme Se Part/Extreme N Douglas (Zone)           | 8/28/2005  | 69               | 0        | 0      | \$15,000        |
| Waterville Plateau (Zone)  | 12/14/2006 | 64               | 0        | 0      | \$0             |
| Wenatchee Area (Zone)  | 12/14/2006 | 64               | 0        | 0      | \$196,000       |
| Upper Columbia Basin (Zone)  | 12/14/2006 | 64               | 0        | 0      | \$2,000         |
| Okanogan Valley (Zone)   | 12/14/2006 | 55               | 0        | 0      | \$1,000         |
| Wenatchee Area (Zone)  | 1/7/2007   | 74               | 0        | 0      | \$10,000,000    |
| Waterville Plateau (Zone)  | 1/7/2007   | 58               | 0        | 0      | \$1,000         |
| Okanogan Valley (Zone)   | 1/7/2007   | 52               | 0        | 0      | \$1,000         |
| Okanogan Valley (Zone)   | 11/12/2007 | 81               | 0        | 0      | \$5,000         |
| Okanogan Valley (Zone)   | 7/10/2008  | 74               | 0        | 0      | \$112,000       |
| Wenatchee Area (Zone)  | 1/6/2009   | 78               | 0        | 0      | \$64,000        |
| Wenatchee Area (Zone)  | 10/3/2009  | 58               | 0        | 0      | \$5,000         |
| Waterville Plateau (Zone)  | 5/3/2010   | 58               | 0        | 0      | \$0             |
| Upper Columbia Basin (Zone)  | 5/3/2010   | 58               | 0        | 0      | \$0             |
| Wenatchee Area (Zone), Okanogan Valley (Zone)                      | 5/3/2010   | 54               | 0        | 0      | \$11,000        |
| Upper Columbia Basin (Zone)  | 11/15/2010 | 63               | 0        | 0      | \$3,000         |
| Wenatchee Area (Zone)  | 11/15/2010 | 63               | 0        | 0      | \$3,000         |
| Wenatchee Area (Zone)  | 11/22/2010 | 49               | 0        | 0      | \$1,000         |
| Wenatchee Area (Zone)  | 2/21/2012  | 37               | 0        | 0      | \$3,000         |
| Upper Columbia Basin (Zone)  | 2/22/2012  | 43               | 0        | 0      | \$5,000         |
| Waterville Plateau (Zone)  | 11/2/2013  | 41               | 0        | 0      | \$1,000         |
| Wenatchee Area (Zone)  | 1/11/2014  | 47               | 0        | 0      | \$1,000         |
| Okanogan Valley (Zone)   | 8/21/2015  | 60               | 0        | 0      | \$0             |
| Okanogan Valley (Zone)   | 8/21/2015  | 58               | 0        | 0      | \$0             |
| Upper Columbia Basin (Zone)  | 11/17/2015 | 63               | 0        | 0      | \$0             |
| Upper Columbia Basin (Zone)  | 11/17/2015 | 59               | 0        | 0      | \$0             |
| Upper Columbia Basin (Zone)  | 11/17/2015 | 61               | 0        | 0      | \$0             |
| Upper Columbia Basin (Zone)  | 11/17/2015 | 68               | 0        | 0      | \$0             |
| Okanogan Valley (Zone)   | 12/9/2015  | 67               | 0        | 0      | \$0             |
| Wenatchee Area (Zone)  | 1/27/2018  | 81               | 0        | 0      | \$200,000       |
| Wenatchee Area (Zone)  | 1/27/2018  | 81               | 0        | 0      | \$200,000       |
| Wenatchee Area (Zone)  | 1/27/2018  | 81               | 0        | 0      | \$200,000       |
| Wenatchee Area (Zone)  | 2/8/2018   | 52               | 0        | 0      | \$10,000        |
| Wenatchee Area (Zone)  | 10/2/2018  | 64               | 0        | 0      | \$0             |
| Okanogan Valley (Zone)   | 10/2/2018  | 70               | 0        | 0      | \$0             |
|  |            | Totals =         | 0        | 0      | \$1,167,700     |

\*The data are from the NOAA NCDC Storm Events Database.

Table D.5 – Riverine Flood Records

| Location       | Event Date | Injuries | Deaths | Property Damage |
|----------------|------------|----------|--------|-----------------|
| Countywide     | 5/21/1997  | 0        | 0      | \$0             |
| Rock Island    | 2/7/2015   | 0        | 0      | \$0             |
| East Wenatchee | 3/9/2016   | 0        | 0      | \$2,000         |
| Totals =       |            | 0        | 0      | \$2,000         |

\*The data are from the NOAA NCDC Storm Events Database.

Table D.6 – Thunderstorm Records

| Location       | Event Date | Wind Speed (Mph) | Injuries | Deaths | Property Damage | Crop Damage |
|----------------|------------|------------------|----------|--------|-----------------|-------------|
| Waterville     | 8/26/1997  | 67               | 0        | 0      | \$0             | \$0         |
| Douglas        | 8/26/1997  | 83               | 0        | 0      | \$0             | \$0         |
| Waterville     | 7/3/2000   | -                | 0        | 0      | \$0             | \$0         |
| Columbia River | 8/10/2013  | 60               | 0        | 0      | \$80,000        | \$100,000   |
| Bridgeport     | 9/5/2013   | 47               | 0        | 0      | \$1,000         | \$0         |
| Orondo         | 9/5/2013   | 58               | 0        | 2      | \$0             | \$0         |
| East Wenatchee | 5/30/2017  | 58               | 0        | 0      | \$0             | \$0         |
| Bridgeport     | 6/25/2018  | 64               | 0        | 0      | \$0             | \$0         |
| Totals =       |            |                  | 2        | 0      | \$81,000        | \$100,000   |

\*The data are from the NOAA NCDC Storm Events Database.

Table D.7 – Tornado Records

| Location       | Event Date | Fujita Class | Injuries | Deaths | Property Damage |
|----------------|------------|--------------|----------|--------|-----------------|
| County         | 7/4/1992   | F0           | 0        | 0      | \$0             |
| East Wenatchee | 5/19/2004  | F0           | 0        | 0      | \$0             |
| Mold           | 7/22/2016  | EFO          | 0        | 0      | \$0             |
| Totals =       |            |              | 0        | 0      | \$0             |

\*The data are from the NOAA NCDC Storm Events Database.

Table D.8 – Wildfire Records

| Location   | Event Date | Cause     | Acres  | Injuries | Deaths | Property Damage |
|--|------------|-----------|--------|----------|--------|-----------------|
| Douglas X Extreme W&N Parts/Nw Grant (Zone)              | 6/16/2006  | Lightning | 500    | 0        | 0      | \$0             |
| Nc&S Okanogan X Extreme Se Part/Extreme N Douglas (Zone) | 8/22/2006  | Lightning | 1,567  | 0        | 0      | \$0             |
| Okanogan Valley (Zone)                                   | 7/7/2007   | Unknown   | 4,428  | 0        | 0      | \$0             |
| Wenatchee Area (Zone)                                    | 7/7/2007   | Human     | 5,209  | 0        | 0      | \$500           |
| Waterville Plateau (Zone)                                | 7/9/2007   | Human     | 3,156  | 0        | 0      | \$0             |
| Upper Columbia Basin (Zone)                              | 7/13/2007  | Unknown   | 500    | 0        | 0      | \$0             |
| Okanogan Valley (Zone)                                   | 7/14/2007  | Lightning | 15,540 | 0        | 0      | \$0             |
| Okanogan Valley (Zone)                                   | 8/18/2007  | Unknown   | 1,200  | 0        | 0      | \$0             |
| Okanogan Valley (Zone)                                   | 8/30/2007  | Human     | 10,500 | 0        | 0      | \$0             |
| Upper Columbia Basin (Zone)                              | 9/1/2007   | Unknown   | 3,492  | 0        | 0      | \$0             |
| Okanogan Valley (Zone)                                   | 7/1/2008   | Lightning | 2,625  | 0        | 0      | \$0             |
| Okanogan Valley (Zone)                                   | 7/1/2008   | Lightning | 1,000  | 0        | 0      | \$20,000        |
| Okanogan Valley (Zone)                                   | 7/4/2008   | Unknown   | 1,500  | 0        | 0      | \$0             |
| Waterville Plateau (Zone)                                | 7/8/2008   | Unknown   | 15,023 | 0        | 0      | \$0             |
| Okanogan Valley (Zone)                                   | 7/10/2008  | Unknown   | 1,420  | 0        | 0      | \$0             |
| Okanogan Valley (Zone)                                   | 7/31/2008  | Unknown   | 2,614  | 0        | 0      | \$0             |
| Okanogan Valley (Zone), Waterville Plateau (Zone)        | 8/1/2008   | Unknown   | 12,513 | 0        | 0      | \$0             |
| Okanogan Valley (Zone)                                   | 8/7/2008   | Unknown   | 22,155 | 0        | 0      | \$0             |
| Okanogan Valley (Zone)                                   | 8/13/2008  | Lightning | 333    | 0        | 0      | \$0             |
| Upper Columbia Basin (Zone)                              | 8/18/2008  | Unknown   | 19,090 | 0        | 0      | \$0             |
| Okanogan Valley (Zone)                                   | 7/23/2009  | Lightning | 955    | 0        | 0      | \$0             |

## Appendix D – NOAA/NWS Records

|   |           |           |           |   |   |               |
|---|-----------|-----------|-----------|---|---|---------------|
| Wenatchee Area (Zone)                             | 7/28/2009 | Lightning | 768       | 0 | 0 | \$0           |
| Upper Columbia Basin (Zone)                       | 8/11/2009 | Unknown   | 10,000    | 0 | 0 | \$4,000       |
| Upper Columbia Basin (Zone)                       | 8/28/2009 | Unknown   | 600       | 0 | 0 | \$0           |
| Okanogan Valley (Zone)                            | 9/1/2009  | Unknown   | 310       | 0 | 0 | \$0           |
| Okanogan Valley (Zone)                            | 9/16/2009 | Unknown   | 1,923     | 0 | 0 | \$0           |
| Wenatchee Area (Zone)                             | 7/4/2010  | Human     | 2,470     | 0 | 0 | \$0           |
| Wenatchee Area (Zone)                             | 7/10/2010 | Unknown   | 19,291    | 0 | 0 | \$0           |
| Wenatchee Area (Zone)                             | 7/28/2010 | Lightning | 2,065     | 0 | 0 | \$0           |
| Waterville Plateau (Zone)                         | 8/3/2010  | Unknown   | 2,000     | 0 | 0 | \$0           |
| Waterville Plateau (Zone)                         | 8/3/2010  | Lightning | 1,000     | 0 | 0 | \$0           |
| Upper Columbia Basin (Zone)                       | 8/26/2010 | Unknown   | 600       | 0 | 0 | \$1,000       |
| Upper Columbia Basin (Zone)                       | 8/26/2010 | Unknown   | 50        | 0 | 0 | \$0           |
| Upper Columbia Basin (Zone)                       | 8/26/2010 | Unknown   | 989       | 0 | 0 | \$0           |
| Upper Columbia Basin (Zone)                       | 8/26/2010 | Unknown   | 667       | 0 | 0 | \$0           |
| Waterville Plateau (Zone), Wenatchee Area (Zone)  | 9/10/2010 | Unknown   | 7,693     | 0 | 0 | \$0           |
| Upper Columbia Basin (Zone)                       | 7/25/2011 | Unknown   | 3,000     | 0 | 0 | \$0           |
| Okanogan Valley (Zone)                            | 8/9/2011  | Unknown   | 408       | 0 | 0 | \$1,000       |
| Waterville Plateau (Zone)                         | 8/12/2011 | Human     | 600       | 0 | 0 | \$0           |
| Upper Columbia Basin (Zone)                       | 8/21/2011 | Human     | 1,100     | 0 | 0 | \$0           |
| Okanogan Valley (Zone)                            | 8/29/2011 | Human     | 1,910     | 0 | 0 | \$0           |
| Okanogan Valley (Zone)                            | 9/18/2011 | Unknown   | 497       | 0 | 0 | \$0           |
| Waterville Plateau (Zone)                         | 7/10/2012 | Unknown   | 470       | 0 | 0 | \$0           |
| Waterville Plateau (Zone)                         | 7/12/2012 | Unknown   | 1,291     | 0 | 0 | \$0           |
| Waterville Plateau (Zone)                         | 7/15/2012 | Lightning | 2,455     | 0 | 0 | \$1,000       |
| Waterville Plateau (Zone)                         | 8/1/2012  | Human     | 12,000    | 0 | 0 | \$100,000     |
| Okanogan Valley (Zone)                            | 8/14/2012 | Lightning | 11,299    | 0 | 0 | \$100,000     |
| Waterville Plateau (Zone)                         | 8/19/2012 | Lightning | 825       | 0 | 0 | \$0           |
| Waterville Plateau (Zone)                         | 9/8/2012  | Unknown   | 91,162    | 0 | 0 | \$600,000     |
| Upper Columbia Basin (Zone)                       | 9/9/2012  | Unknown   | 18,000    | 0 | 0 | \$0           |
| Okanogan Valley (Zone)                            | 10/2/2012 | Unknown   | 5,000     | 0 | 0 | \$500,000     |
| Okanogan Valley (Zone)                            | 7/15/2013 | Human     | 2,000     | 0 | 0 | \$261,000     |
| Wenatchee Area (Zone)                             | 7/27/2013 | Human     |           | 2 | 0 | \$3,500,000   |
| Wenatchee Area (Zone)                             | 8/9/2013  | Lightning | 5,445     | 0 | 0 | \$0           |
| Wenatchee Area (Zone)                             | 6/8/2014  | Unknown   |           | 0 | 0 | \$50,000      |
| Okanogan Valley (Zone)                            | 7/14/2014 | Lightning | 269,186   | 0 | 0 | \$120,000,000 |
| Upper Columbia Basin (Zone)                       | 7/19/2014 | Human     | 10,500    | 0 | 0 | \$20,000      |
| Wenatchee Area (Zone)                             | 6/28/2015 | Unknown   | 2,950     | 4 | 0 | \$0           |
| Waterville Plateau (Zone)                         | 6/30/2015 | Unknown   | 2,100     | 0 | 0 | \$0           |
| Waterville Plateau (Zone)                         | 7/1/2015  | Unknown   | 2,424     | 0 | 0 | \$0           |
| Waterville Plateau (Zone)                         | 7/5/2015  | Unknown   | 1,796     | 0 | 0 | \$0           |
| Waterville Plateau (Zone)                         | 7/10/2015 | Lightning | 22,337    | 0 | 0 | \$0           |
| Waterville Plateau (Zone)                         | 7/15/2015 | Unknown   | 2,300     | 0 | 0 | \$0           |
| Upper Columbia Basin (Zone)                       | 8/1/2015  | Unknown   | 1,500     | 0 | 0 | \$0           |
| Upper Columbia Basin (Zone)                       | 8/10/2015 | Unknown   | 542       | 0 | 0 | \$0           |
| Okanogan Valley (Zone)                            | 8/13/2015 | Human     | 218,138   | 0 | 0 | \$0           |
| Okanogan Valley (Zone), Waterville Plateau (Zone) | 8/14/2015 | Lightning | 133,707   | 0 | 0 | \$0           |
| Okanogan Valley (Zone)                            | 6/8/2016  | Human     | 1,358     | 0 | 0 | \$0           |
| Upper Columbia Basin (Zone)                       | 8/21/2016 | Human     | 4,983     | 0 | 0 | \$0           |
| Upper Columbia Basin (Zone)                       | 9/11/2016 | Human     | 5,237     | 0 | 0 | \$0           |
| Waterville Plateau (Zone)                         | 7/27/2018 | Unknown   | 1,842     | 0 | 0 | \$1,800,000   |
| Waterville Plateau (Zone)                         | 8/11/2018 | Unknown   | 74,835    | 0 | 0 | \$86,4000     |
|   |           | Totals =  | 1,088,943 | 6 | 0 | \$127,822,500 |

\*The data are from the NOAA NCDC Storm Events Database.

### Table D.9 – Winter Storm Records

| Location  | Event Date | Storm Type | Injuries | Deaths | Property Damage |
|---|------------|------------|----------|--------|-----------------|
| Wenatchee Area (Zone), Waterville Plateau (Zone)                              | 12/14/2000 | Winter Mix | 0        | 0      | \$0             |
| Wenatchee Area (Zone)   | 1/15/2005  | Ice Storm  | 0        | 0      | \$0             |
| Waterville Plateau (Zone)   | 11/24/2005 | Winter Mix | 0        | 0      | \$250,000       |
| Upper Columbia Basin (Zone), Wenatchee Area (Zone), Waterville Plateau (Zone) | 12/1/2005  | Winter Mix | 0        | 0      | \$0             |
| Okanogan Valley (Zone)  | 12/19/2005 | Winter Mix | 0        | 0      | \$0             |
| Okanogan Valley (Zone), Waterville Plateau (Zone)                             | 1/28/2006  | Winter Mix | 0        | 0      | \$0             |
| Nc&S Okanogan X Extreme Se Part/Extreme N Douglas (Zone)                      | 1/31/2006  | Winter Mix | 0        | 0      | \$0             |
| Wenatchee Area (Zone)   | 2/1/2006   | Winter Mix | 0        | 3      | \$0             |
| Nc&S Okanogan X Extreme Se Part/Extreme N Douglas (Zone)                      | 2/1/2006   | Winter Mix | 0        | 0      | \$0             |

Appendix D – NOAA/NWS Records

|   |            |            |   |   |           |
|---|------------|------------|---|---|-----------|
| Wenatchee Area (Zone)   | 1/1/2007   | Winter Mix | 0 | 0 | \$0       |
| Waterville Plateau (Zone)   | 5/20/2007  | Winter Mix | 0 | 0 | \$11,000  |
| Wenatchee Area (Zone)   | 12/1/2007  | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 1/8/2008   | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 1/30/2008  | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 12/20/2008 | Winter Mix | 0 | 0 | \$0       |
| Wenatchee Area (Zone)   | 11/19/2010 | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone), Waterville Plateau (Zone)                        | 11/22/2010 | Blizzard   | 0 | 0 | \$0       |
| Wenatchee Area (Zone)   | 11/22/2010 | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 12/28/2010 | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 1/7/2011   | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 1/13/2011  | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 12/20/2013 | Winter Mix | 0 | 0 | \$200,000 |
| Wenatchee Area (Zone), Upper Columbia Basin (Zone)                            | 2/6/2014   | Winter Mix | 0 | 0 | \$0       |
| Waterville Plateau (Zone), Upper Columbia Basin (Zone)                        | 2/8/2014   | Winter Mix | 0 | 0 | \$0       |
| Okanogan Valley (Zone), Waterville Plateau (Zone)                             | 2/10/2014  | Winter Mix | 0 | 0 | \$0       |
| Waterville Plateau (Zone)   | 2/15/2014  | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 2/22/2014  | Winter Mix | 0 | 0 | \$0       |
| Wenatchee Area (Zone)   | 11/21/2014 | Winter Mix | 0 | 0 | \$0       |
| Wenatchee Area (Zone)   | 1/4/2015   | Winter Mix | 0 | 0 | \$0       |
| Okanogan Valley (Zone), Upper Columbia Basin (Zone), Wenatchee Area (Zone)    | 1/15/2015  | Winter Mix | 0 | 0 | \$0       |
| Okanogan Valley (Zone), Waterville Plateau (Zone)                             | 1/17/2015  | Winter Mix | 0 | 0 | \$0       |
| Okanogan Valley (Zone), Waterville Plateau (Zone), Wenatchee Area (Zone)      | 1/15/2016  | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 1/1/2017   | Winter Mix | 0 | 0 | \$0       |
| Waterville Plateau (Zone)   | 1/10/2017  | Blizzard   | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 1/10/2017  | Winter Mix | 0 | 0 | \$0       |
| Okanogan Valley (Zone), Wenatchee Area (Zone), Upper Columbia Basin (Zone)    | 1/17/2017  | Winter Mix | 0 | 0 | \$0       |
| Waterville Plateau (Zone), Upper Columbia Basin (Zone), Wenatchee Area (Zone) | 1/17/2017  | Ice Storm  | 0 | 0 | \$0       |
| Waterville Plateau (Zone), Upper Columbia Basin (Zone)                        | 2/8/2017   | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 2/8/2017   | Ice Storm  | 0 | 0 | \$0       |
| Okanogan Valley (Zone), Upper Columbia Basin (Zone)                           | 1/16/2018  | Winter Mix | 0 | 0 | \$0       |
| Wenatchee Area (Zone), Waterville Plateau (Zone)                              | 12/14/2000 | Winter Mix | 0 | 0 | \$0       |
| Wenatchee Area (Zone)   | 1/15/2005  | Ice Storm  | 0 | 0 | \$0       |
| Waterville Plateau (Zone)   | 11/24/2005 | Winter Mix | 0 | 0 | \$250,000 |
| Upper Columbia Basin (Zone), Wenatchee Area (Zone), Waterville Plateau (Zone) | 12/1/2005  | Winter Mix | 0 | 0 | \$0       |
| Okanogan Valley (Zone)  | 12/19/2005 | Winter Mix | 0 | 0 | \$0       |
| Okanogan Valley (Zone), Waterville Plateau (Zone)                             | 1/28/2006  | Winter Mix | 0 | 0 | \$0       |
| Nc&S Okanogan X Extreme Se Part/Extreme N Douglas (Zone)                      | 1/31/2006  | Winter Mix | 0 | 0 | \$0       |
| Wenatchee Area (Zone)   | 2/1/2006   | Winter Mix | 0 | 3 | \$0       |
| Nc&S Okanogan X Extreme Se Part/Extreme N Douglas (Zone)                      | 2/1/2006   | Winter Mix | 0 | 0 | \$0       |
| Wenatchee Area (Zone)   | 1/1/2007   | Winter Mix | 0 | 0 | \$0       |
| Waterville Plateau (Zone)   | 5/20/2007  | Winter Mix | 0 | 0 | \$11,000  |
| Wenatchee Area (Zone)   | 12/1/2007  | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 1/8/2008   | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 1/30/2008  | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 12/20/2008 | Winter Mix | 0 | 0 | \$0       |
| Wenatchee Area (Zone)   | 11/19/2010 | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone), Waterville Plateau (Zone)                        | 11/22/2010 | Blizzard   | 0 | 0 | \$0       |
| Wenatchee Area (Zone)   | 11/22/2010 | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 12/28/2010 | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 1/7/2011   | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 1/13/2011  | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 12/20/2013 | Winter Mix | 0 | 0 | \$200,000 |
| Wenatchee Area (Zone), Upper Columbia Basin (Zone)                            | 2/6/2014   | Winter Mix | 0 | 0 | \$0       |
| Waterville Plateau (Zone), Upper Columbia Basin (Zone)                        | 2/8/2014   | Winter Mix | 0 | 0 | \$0       |
| Okanogan Valley (Zone), Waterville Plateau (Zone)                             | 2/10/2014  | Winter Mix | 0 | 0 | \$0       |
| Waterville Plateau (Zone)   | 2/15/2014  | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 2/22/2014  | Winter Mix | 0 | 0 | \$0       |
| Wenatchee Area (Zone)   | 11/21/2014 | Winter Mix | 0 | 0 | \$0       |
| Wenatchee Area (Zone)   | 1/4/2015   | Winter Mix | 0 | 0 | \$0       |
| Okanogan Valley (Zone), Upper Columbia Basin (Zone), Wenatchee Area (Zone)    | 1/15/2015  | Winter Mix | 0 | 0 | \$0       |
| Okanogan Valley (Zone), Waterville Plateau (Zone)                             | 1/17/2015  | Winter Mix | 0 | 0 | \$0       |
| Okanogan Valley (Zone), Waterville Plateau (Zone), Wenatchee Area (Zone)      | 1/15/2016  | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 1/1/2017   | Winter Mix | 0 | 0 | \$0       |
| Waterville Plateau (Zone)   | 1/10/2017  | Blizzard   | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)   | 1/10/2017  | Winter Mix | 0 | 0 | \$0       |
| Okanogan Valley (Zone), Wenatchee Area (Zone), Upper Columbia Basin (Zone)    | 1/17/2017  | Winter Mix | 0 | 0 | \$0       |
| Waterville Plateau (Zone), Upper Columbia Basin (Zone), Wenatchee Area (Zone) | 1/17/2017  | Ice Storm  | 0 | 0 | \$0       |

## Appendix D – NOAA/NWS Records

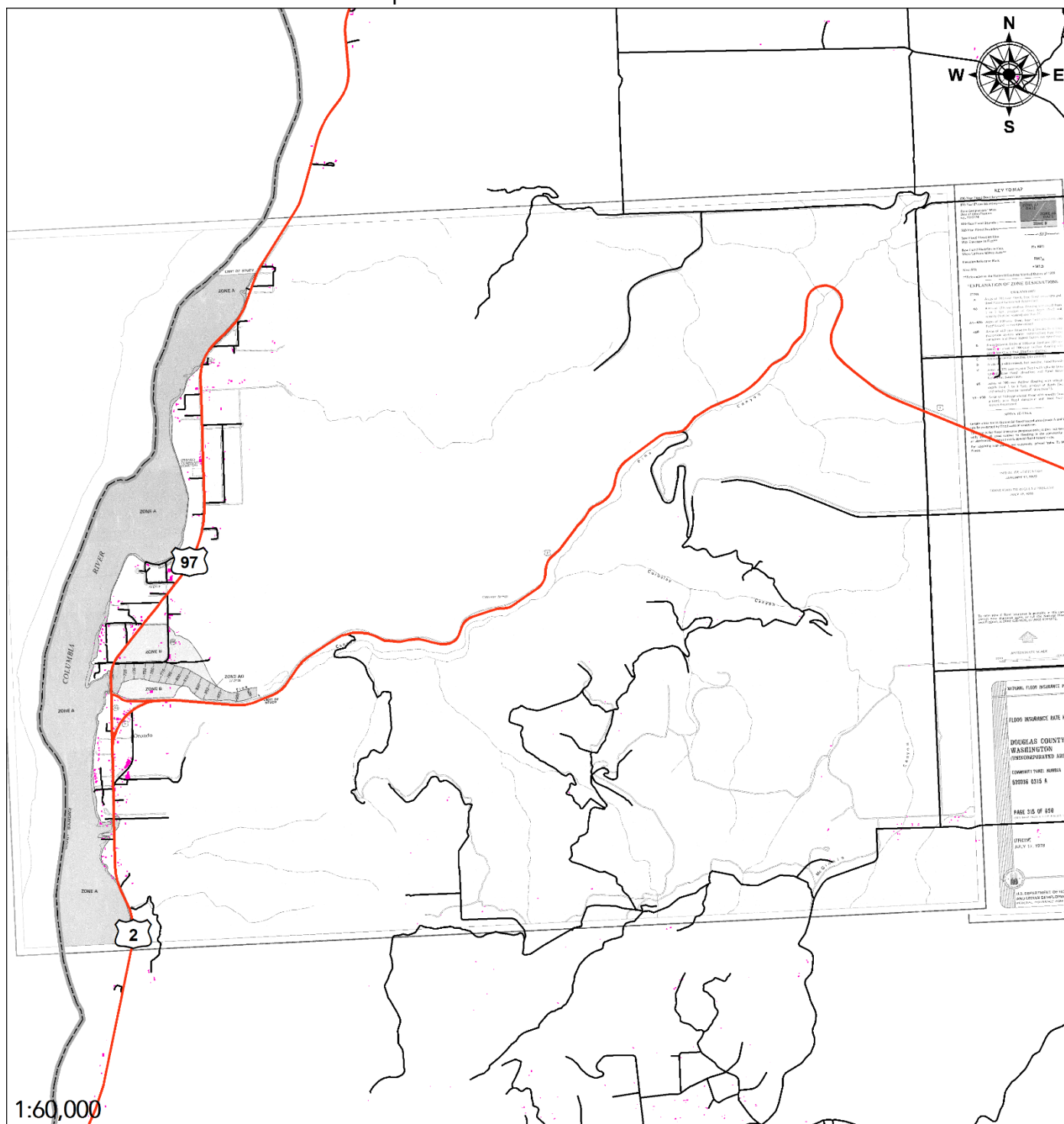
|  |           |            |   |   |           |
|--|-----------|------------|---|---|-----------|
| Waterville Plateau (Zone), Upper Columbia Basin (Zone) | 2/8/2017  | Winter Mix | 0 | 0 | \$0       |
| Upper Columbia Basin (Zone)                            | 2/8/2017  | Ice Storm  | 0 | 0 | \$0       |
| Okanogan Valley (Zone), Upper Columbia Basin (Zone)    | 1/16/2018 | Winter Mix | 0 | 0 | \$0       |
| Totals =   |           |            | 3 | 0 | \$461,000 |

\*The data are from the NOAA NCDC Storm Events Database.

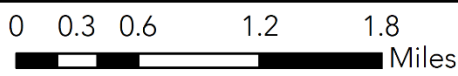
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# Appendix E – Georeferenced FIRMs



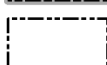


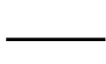
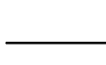

Map E.1 – FIRM Panel 5300360315A



1:60,000



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

-  State Borders
-  County Borders
-  Municipal Borders
-  Structures
-  U.S. Highways
-  State Highways
-  Other Roads
-  Railways

**KEY TO MAP**

**EXPLANATION OF ZONE DESIGNATIONS**

**ZONE A**

**ZONE B**

**ZONE C**

**ZONE D**

**ZONE E**

**ZONE F**

**ZONE G**

**ZONE H**

**ZONE I**

**ZONE J**

**ZONE K**

**ZONE L**

**ZONE M**

**ZONE N**

**ZONE O**

**ZONE P**

**ZONE Q**

**ZONE R**

**ZONE S**

**ZONE T**

**ZONE U**

**ZONE V**

**ZONE W**

**ZONE X**

**ZONE Y**

**ZONE Z**

**ZONE AA**

**ZONE AB**

**ZONE AC**

**ZONE AD**

**ZONE AE**

**ZONE AF**

**ZONE AG**

**ZONE AH**

**ZONE AI**

**ZONE AJ**

**ZONE AK**

**ZONE AL**

**ZONE AM**

**ZONE AN**

**ZONE AO**

**ZONE AP**

**ZONE AQ**

**ZONE AR**

**ZONE AS**

**ZONE AT**

**ZONE AU**

**ZONE AV**

**ZONE AW**

**ZONE AX**

**ZONE AY**

**ZONE AZ**

**ZONE BA**

**ZONE BB**

**ZONE BC**

**ZONE BD**

**ZONE BE**

**ZONE BF**

**ZONE BG**

**ZONE BH**

**ZONE BI**

**ZONE BJ**

**ZONE BK**

**ZONE BL**

**ZONE BM**

**ZONE BN**

**ZONE BO**

**ZONE BP**

**ZONE BQ**

**ZONE BR**

**ZONE BS**

**ZONE BT**

**ZONE BU**

**ZONE BV**

**ZONE BW**

**ZONE BX**

**ZONE BY**

**ZONE BZ**

**ZONE CA**

**ZONE CB**

**ZONE CC**

**ZONE CD**

**ZONE CE**

**ZONE CF**

**ZONE CG**

**ZONE CH**

**ZONE CI**

**ZONE CJ**

**ZONE CK**

**ZONE CL**

**ZONE CM**

**ZONE CN**

**ZONE CO**

**ZONE CP**

**ZONE CQ**

**ZONE CR**

**ZONE CS**

**ZONE CT**

**ZONE CU**

**ZONE CV**

**ZONE CW**

**ZONE CX**

**ZONE CY**

**ZONE CZ**

**ZONE DA**

**ZONE DB**

**ZONE DC**

**ZONE DD**

**ZONE DE**

**ZONE DF**

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**ZONE ZX**

**ZONE ZY**

**ZONE ZZ**

**MINIMUM FLOOD INSURANCE RATE MAP**

**FLOOD INSURANCE RATE MAP**

**DOUGLAS COUNTY, WASHINGTON**

**COMMITTEE NUMBER**

**5300360315A**

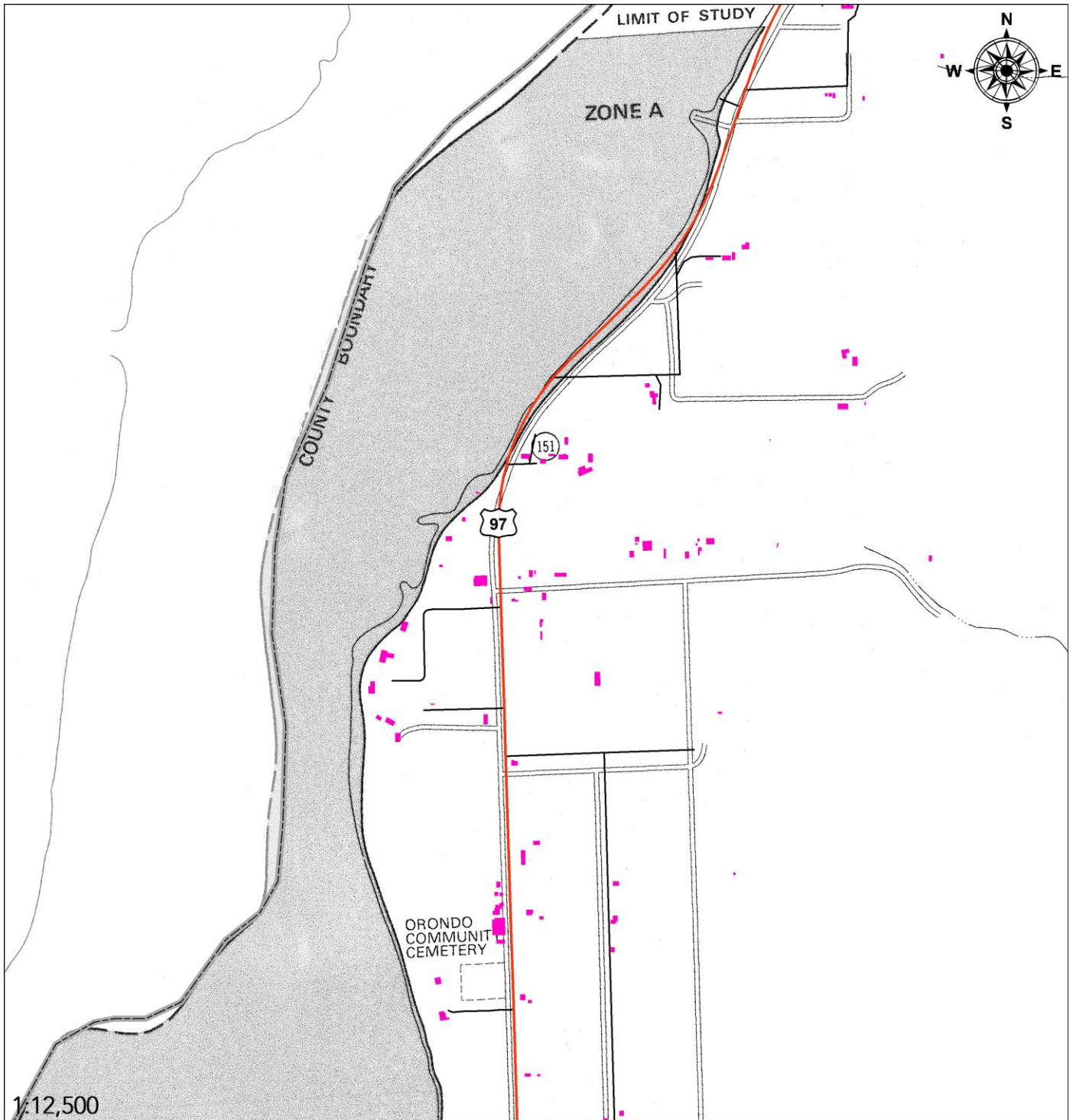
**PAGE 315 OF 650**

**ISSUED**

**JULY 11, 1978**

**ALL DEVELOPMENTS ON THESE AREAS MUST BE IN ACCORDANCE WITH THE FLOOD INSURANCE RATE MAP**

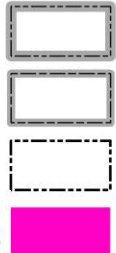
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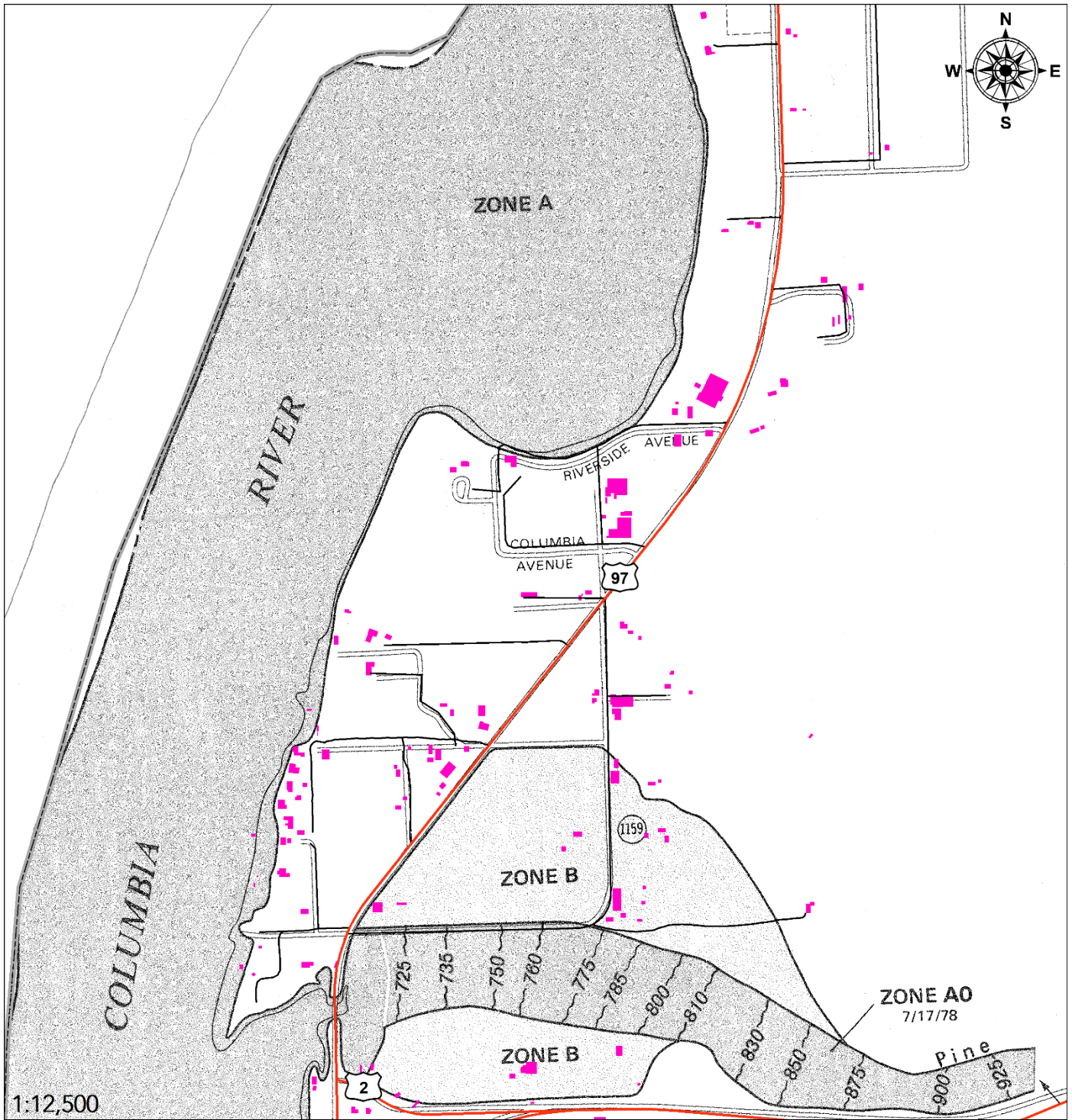
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Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS



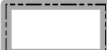







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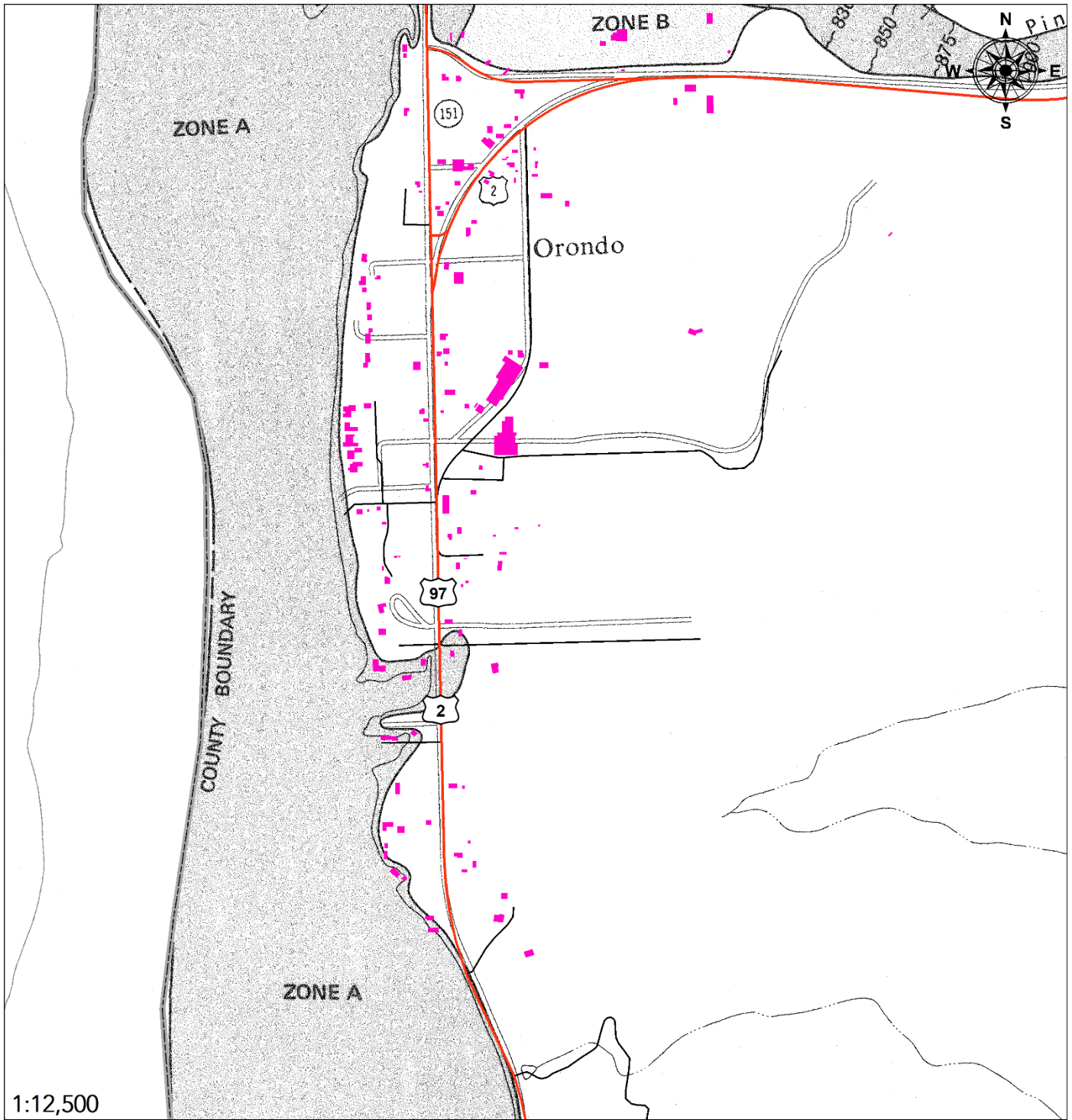
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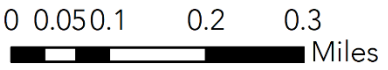
Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

- |   |                   |   |                |
|---|-------------------|---|----------------|
|  | State Borders     |  | U.S. Highways  |
|  | County Borders    |  | State Highways |
|  | Municipal Borders |  | Other Roads    |
|  | Structures        |  | Railways       |




Map E.4 – FIRM Panel 5300360315A - 3



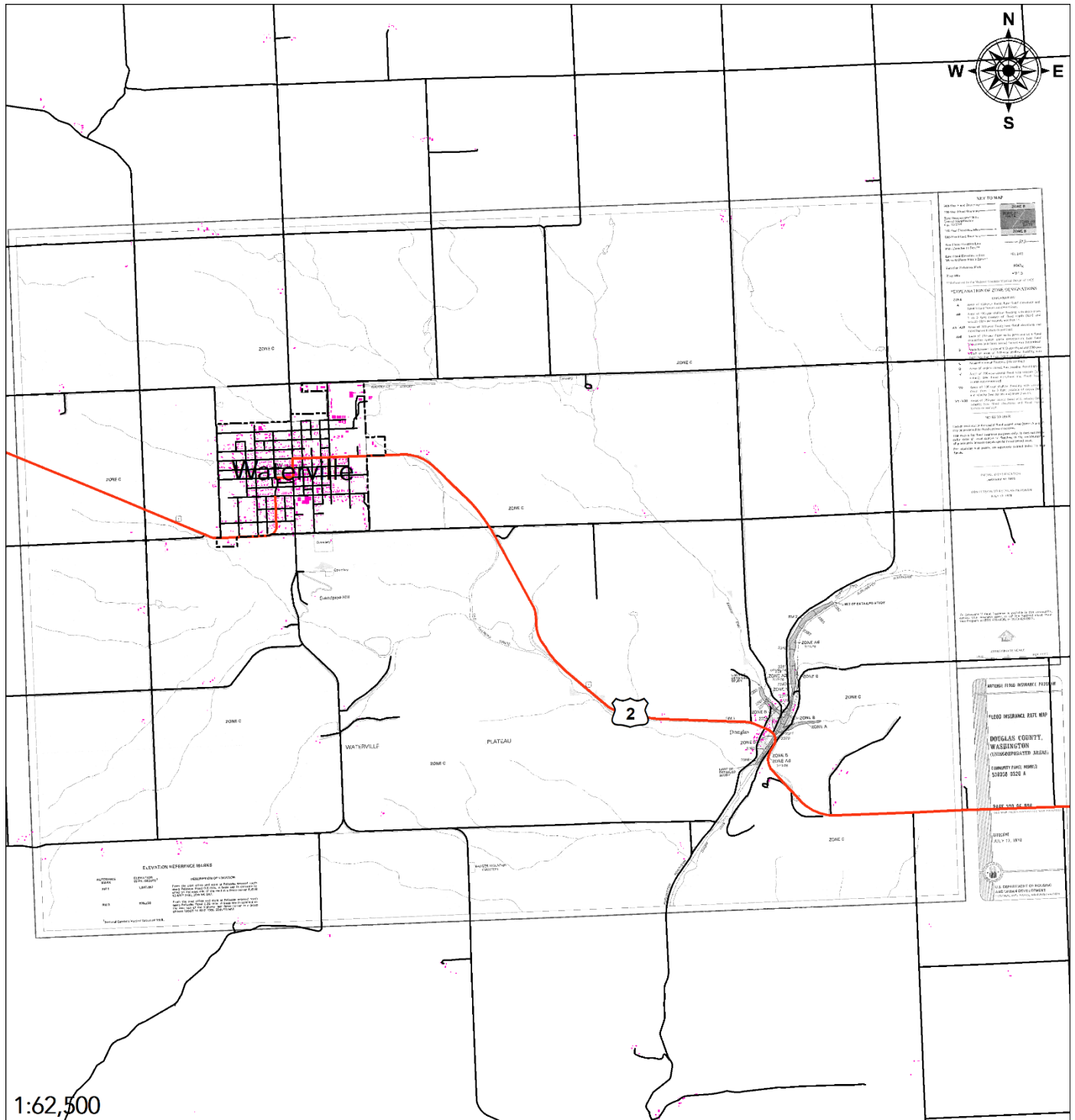
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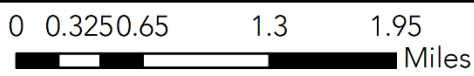
Data Sources: ESRI,  
FEMA, Silvis Labs,  
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USDA, USGS


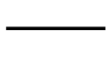
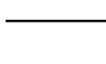
-  State Borders
-  County Borders
-  Municipal Borders
-  Structures
-  U.S. Highways
-  State Highways
-  Other Roads
-  Railways

Map E.5 – FIRM Panel 5300360320A



1:62,500



-  State Borders
-  County Borders
-  Municipal Borders
-  Structures
-  U.S. Highways
-  State Highways
-  Other Roads
-  Railways



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

**KEY TO MAP**

Map Title and Number: 5300360320A  
 Date: 11/11/11  
 Scale: 1:62,500  
 Author: Douglas County  
 Project: Hazard Mitigation Plan  
 Revision: 1.0

**EXPLANATION OF ZONE DESIGNATIONS**

**ZONE A**  
 Areas of Special Flood Hazard that are subject to flooding from 1% annual chance flood events. These areas are subject to the most severe flooding and are the most vulnerable to damage.

**ZONE B**  
 Areas of Special Flood Hazard that are subject to flooding from 1% annual chance flood events. These areas are subject to the most severe flooding and are the most vulnerable to damage.

**ZONE C**  
 Areas of Special Flood Hazard that are subject to flooding from 1% annual chance flood events. These areas are subject to the most severe flooding and are the most vulnerable to damage.

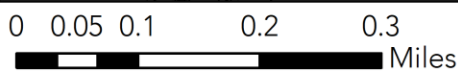
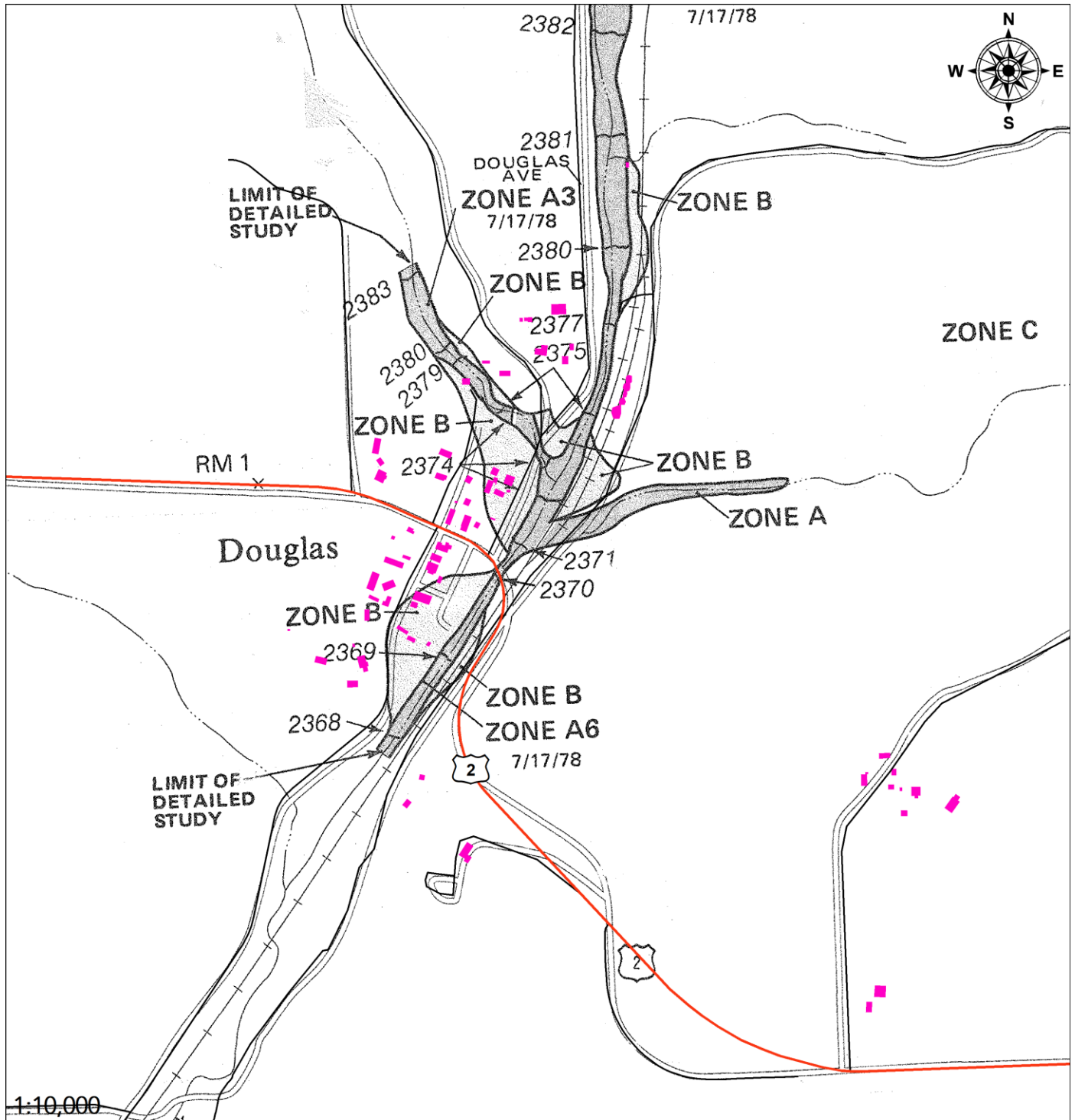
**NEED TO KNOW**

This map is a technical drawing and is not intended to be used for any purpose other than that for which it was prepared. The user of this map assumes all liability for any use of this map for any purpose other than that for which it was prepared.

**APPROVED BY:**  
 Douglas County Board of Commissioners  
 July 13, 2011

**NATIONAL FLOOD INSURANCE PROGRAM**  
 FLOOD INSURANCE RATE MAP  
 DOUGLAS COUNTY, WASHINGTON  
 UNINCORPORATED AREAS  
 COMMUNITY FLOOD NUMBER  
 5300360320A  
 BASE DATE: 06/01/08

Map E.6 – FIRM Panel 5300360320A - 1

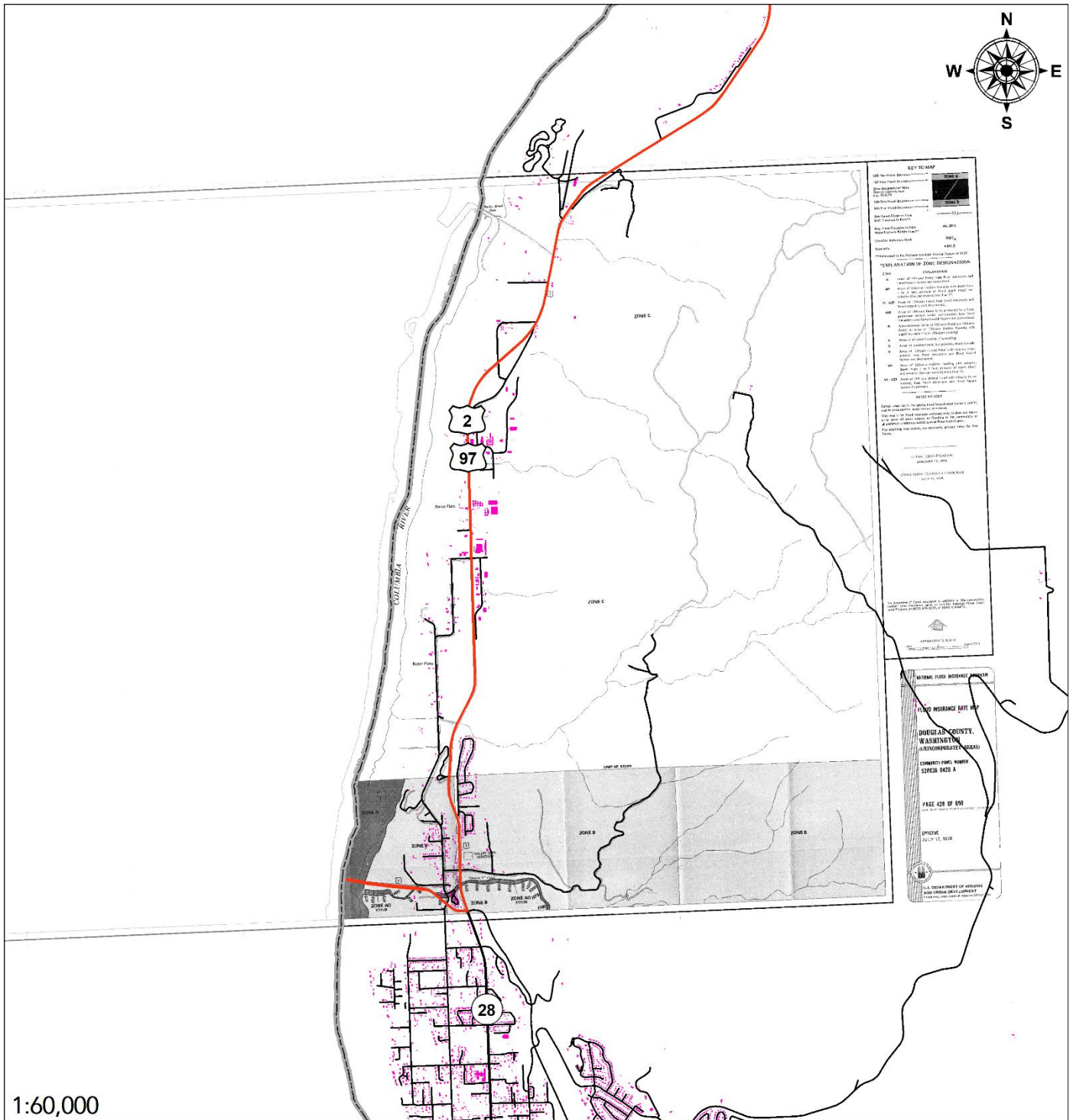


- State Borders
- County Borders
- Municipal Borders
- Structures
- U.S. Highways
- State Highways
- Other Roads
- Railways



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

Map E.7 – FIRM Panel 5300360420A











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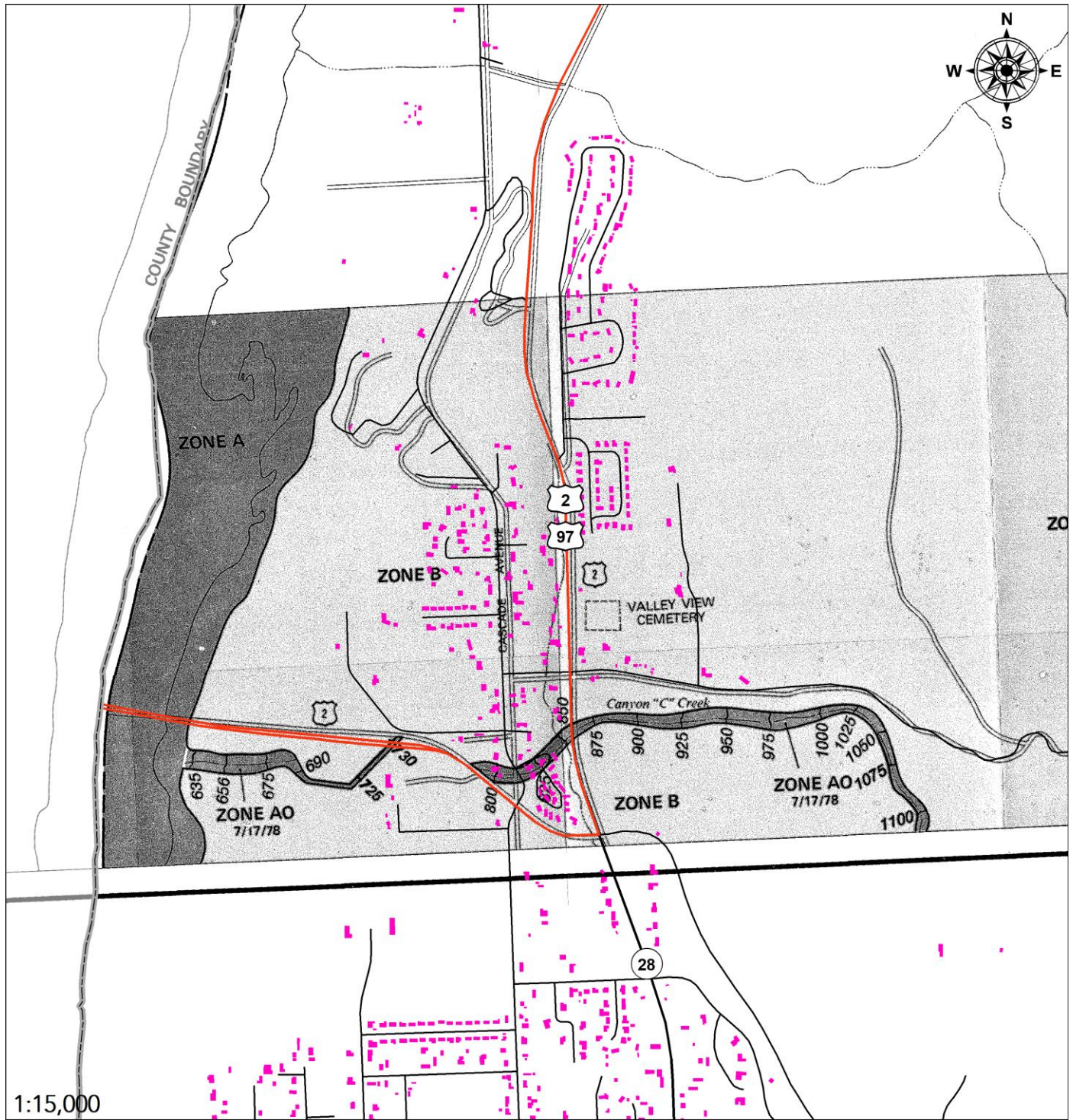
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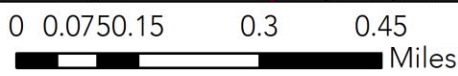
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U.S. Census Bureau,  
USDA, USGS



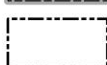


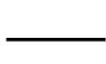
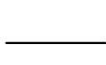

-  State Borders
-  County Borders
-  Municipal Borders
-  Structures
-  U.S. Highways
-  State Highways
-  Other Roads
-  Railways

Map E.8 – FIRM Panel 5300360420A - 1



1:15,000

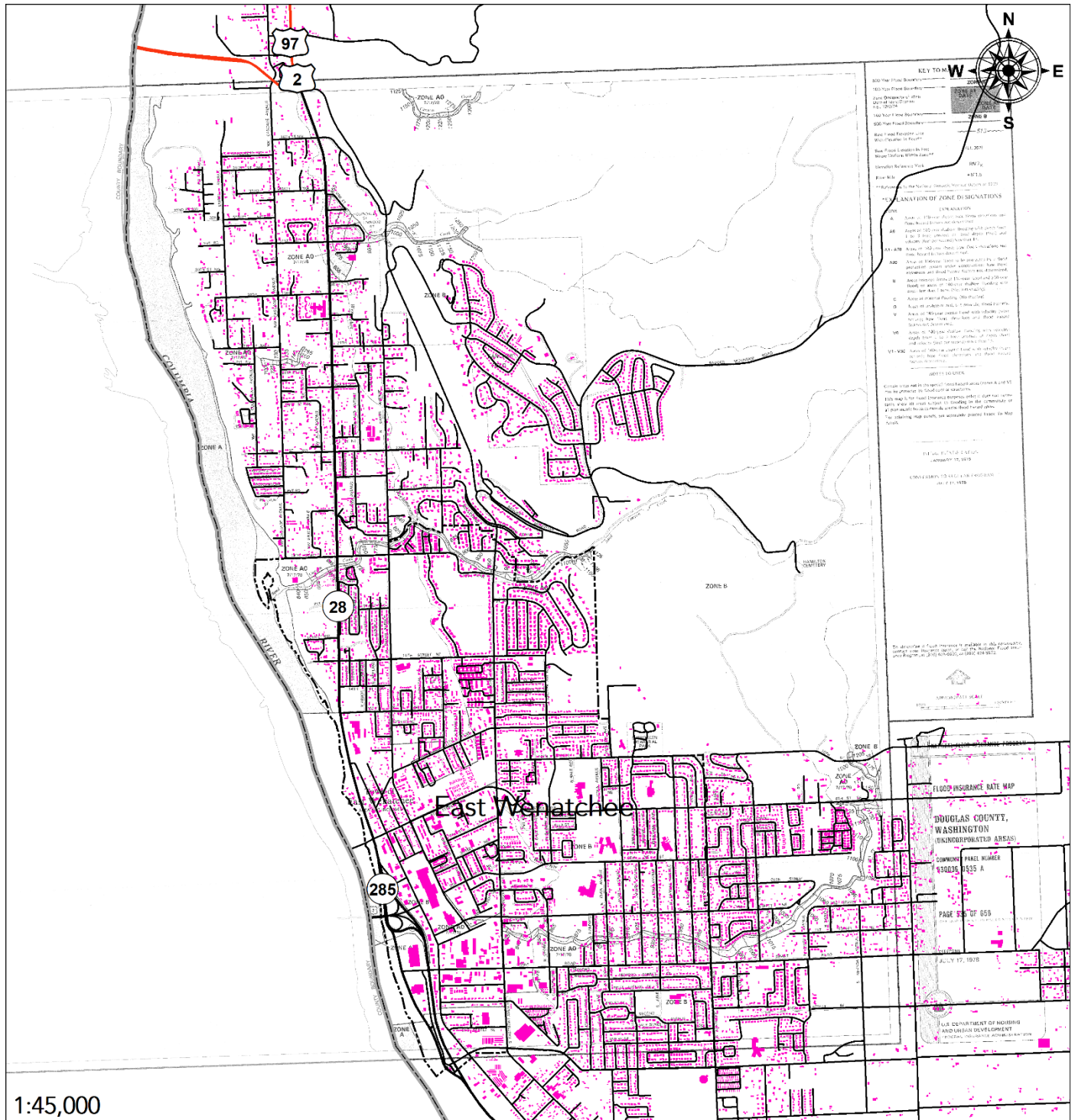


-  State Borders
-  County Borders
-  Municipal Borders
-  Structures
-  U.S. Highways
-  State Highways
-  Other Roads
-  Railways

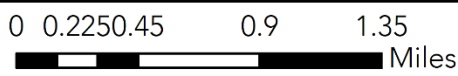


Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

Map E.9 – FIRM Panel 5300360535A



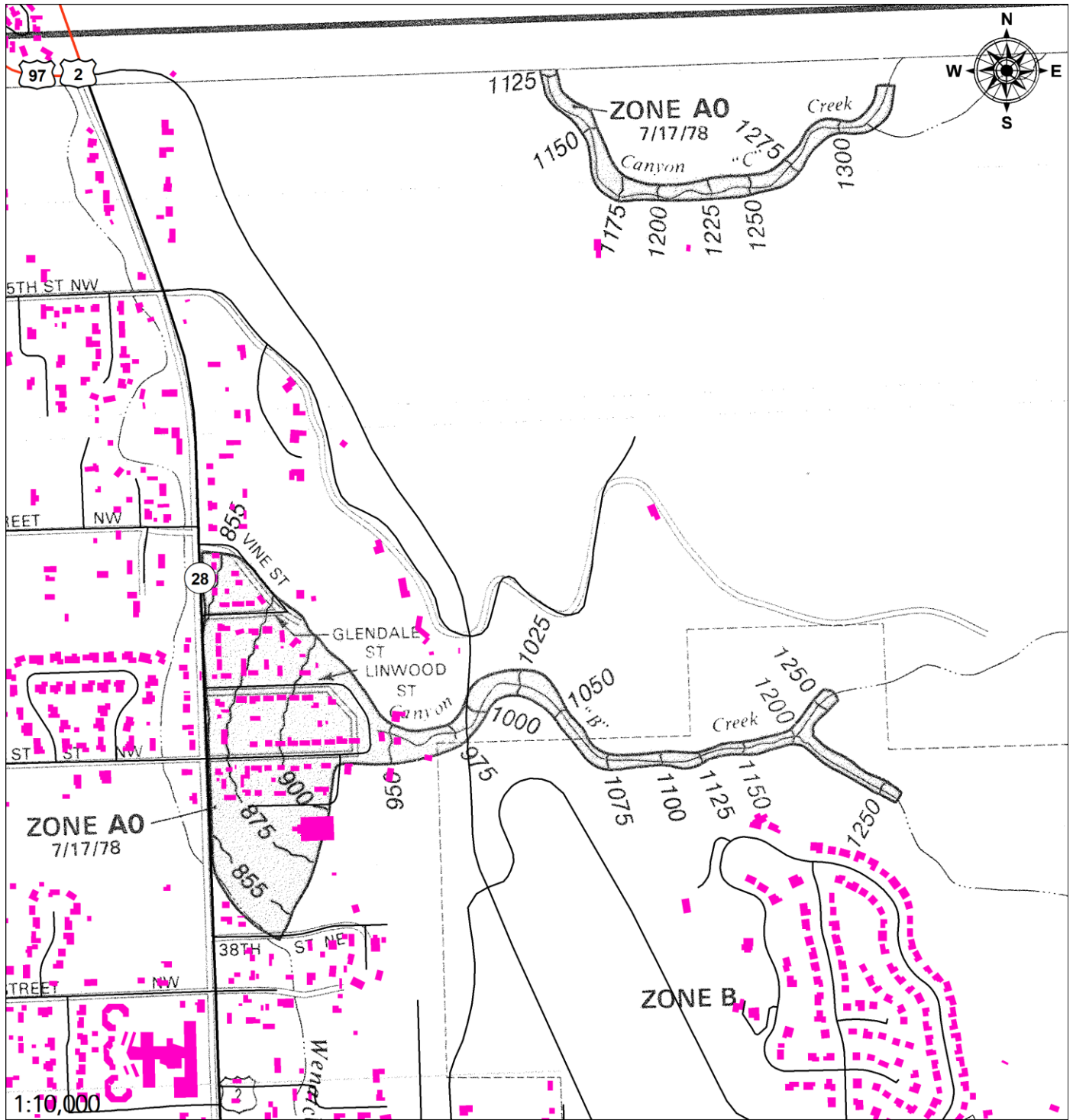
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Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

- State Borders
- County Borders
- Municipal Borders
- Structures
- U.S. Highways
- State Highways
- Other Roads
- Railways

Map E.10 – FIRM Panel 5300360535A - 1



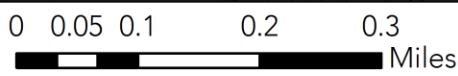
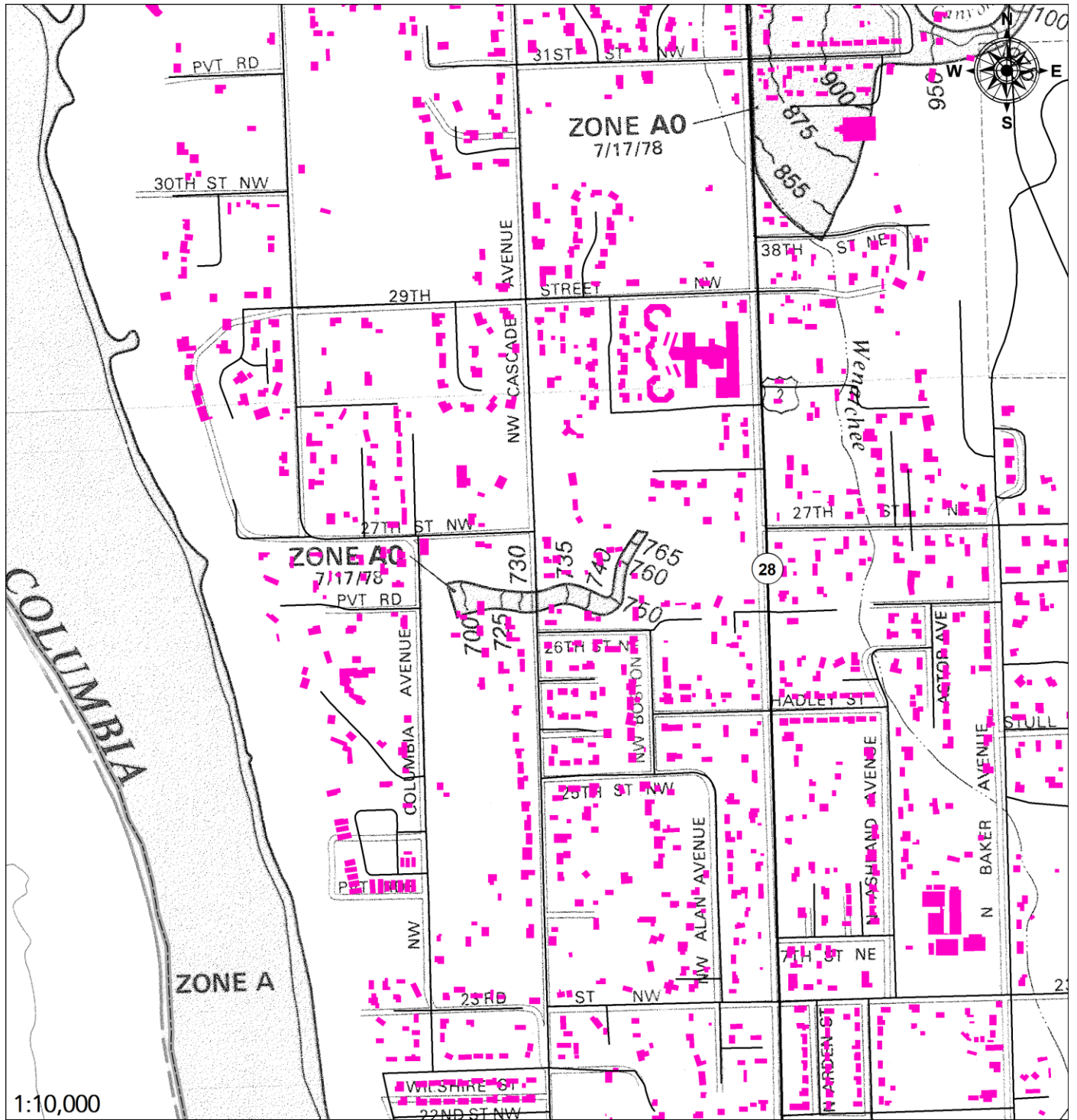
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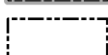

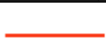
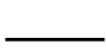
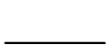

Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

- State Borders
- County Borders
- Municipal Borders
- Structures
- U.S. Highways
- State Highways
- Other Roads
- Railways

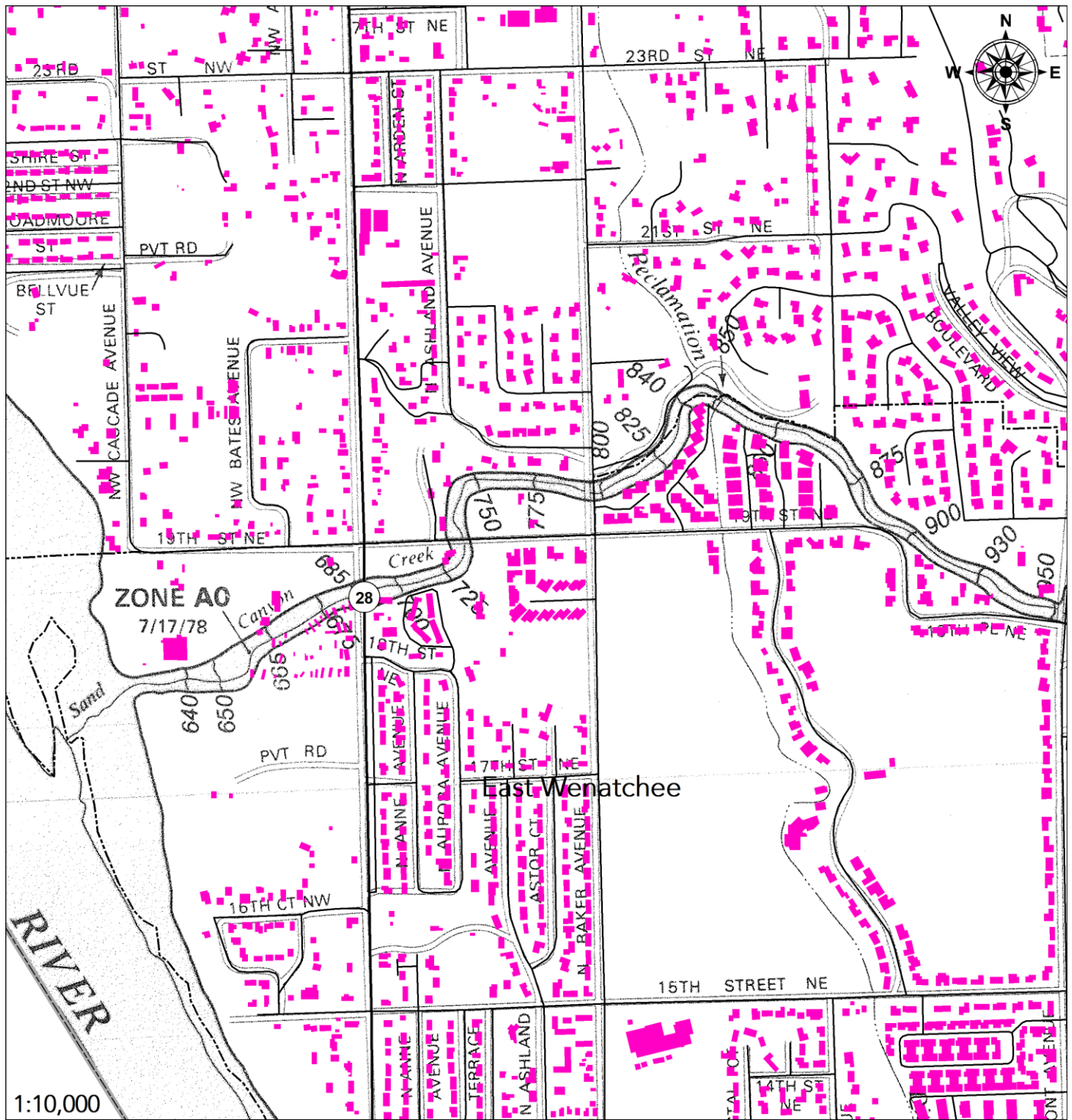
Map E.11 – FIRM Panel 5300360535A - 2



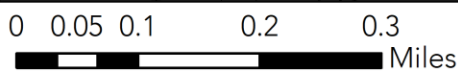
Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

-  State Borders
-  County Borders
-  Municipal Borders
-  Structures
-  U.S. Highways
-  State Highways
-  Other Roads
-  Railways

Map E.12 – FIRM Panel 5300360535A - 3



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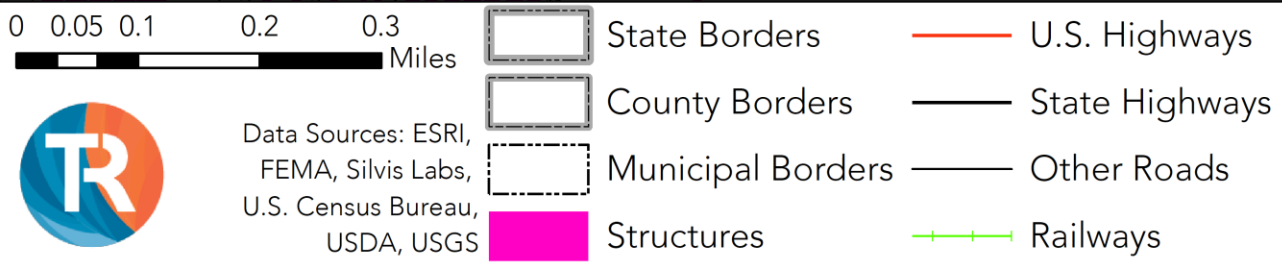
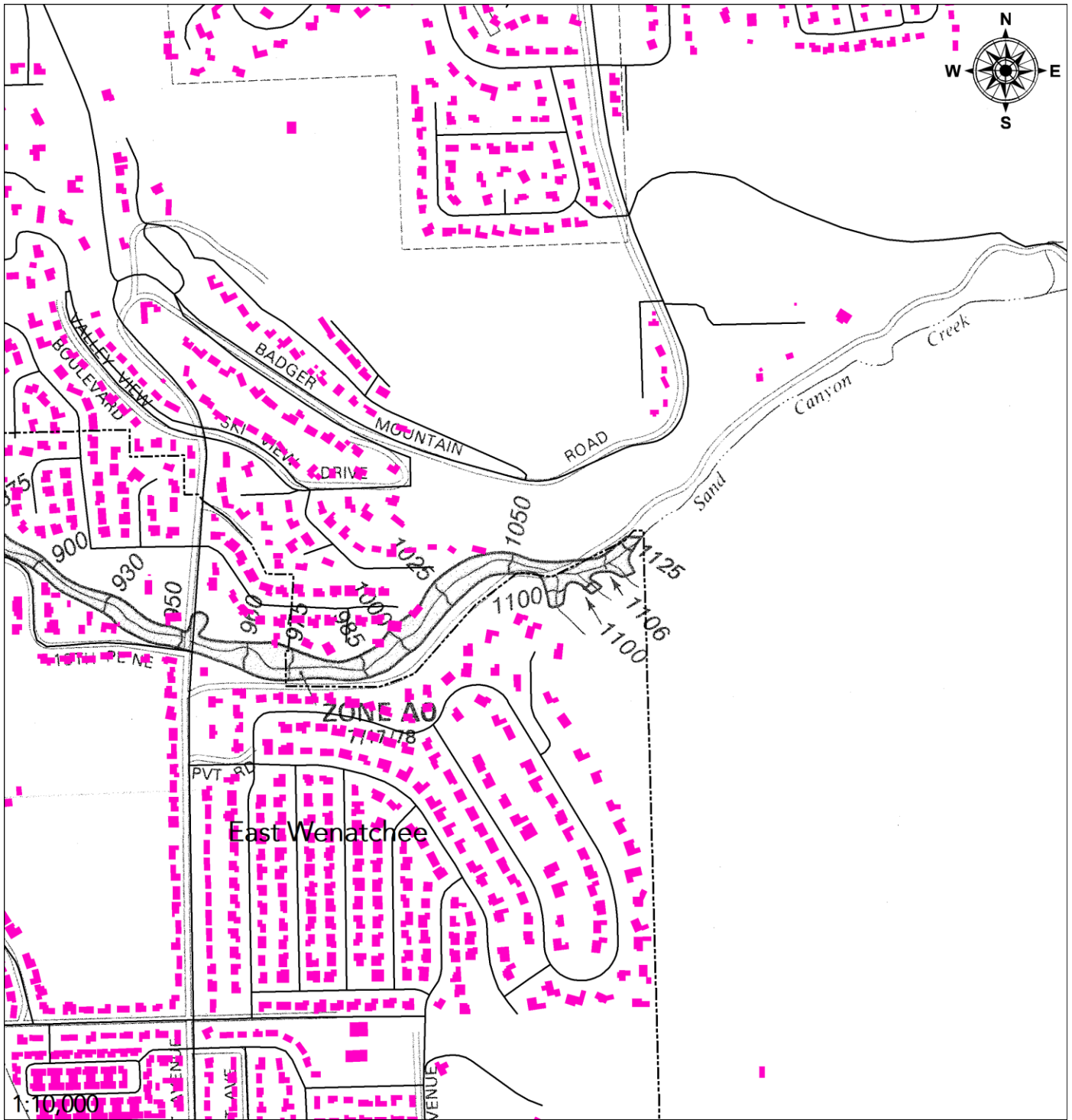


-  State Borders
-  County Borders
-  Municipal Borders
-  Structures
-  U.S. Highways
-  State Highways
-  Other Roads
-  Railways

Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS



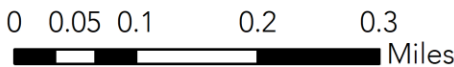
Map E.13 – FIRM Panel 5300360535A - 4





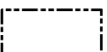





Map E.14 – FIRM Panel 5300360535A - 5



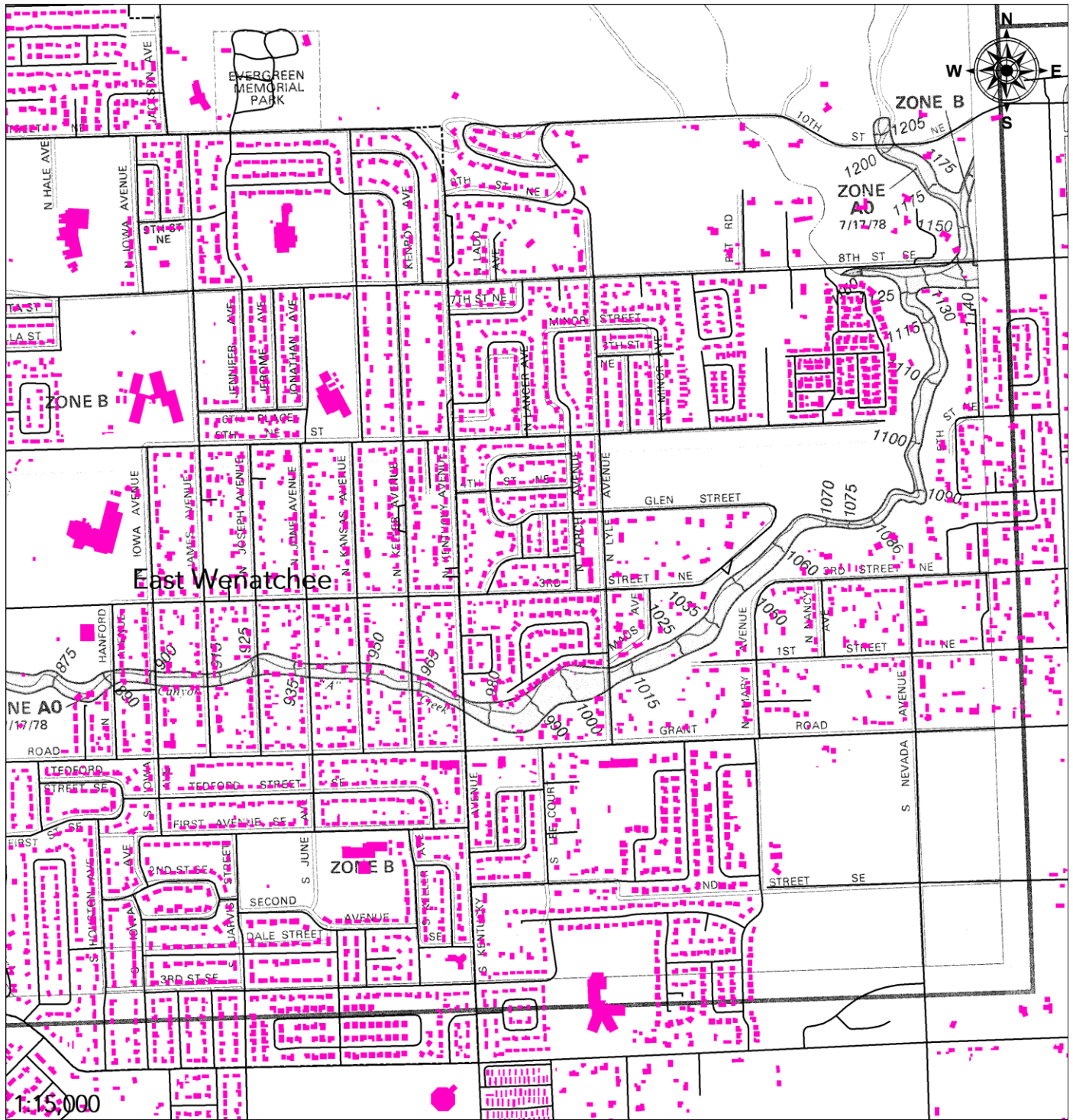
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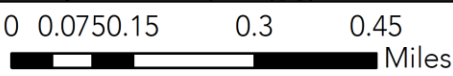
Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS



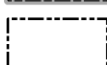


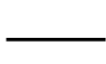
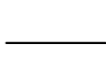

-  State Borders
-  County Borders
-  Municipal Borders
-  Structures
-  U.S. Highways
-  State Highways
-  Other Roads
-  Railways

Map E.15 – FIRM Panel 5300360535A - 6



1:15,000



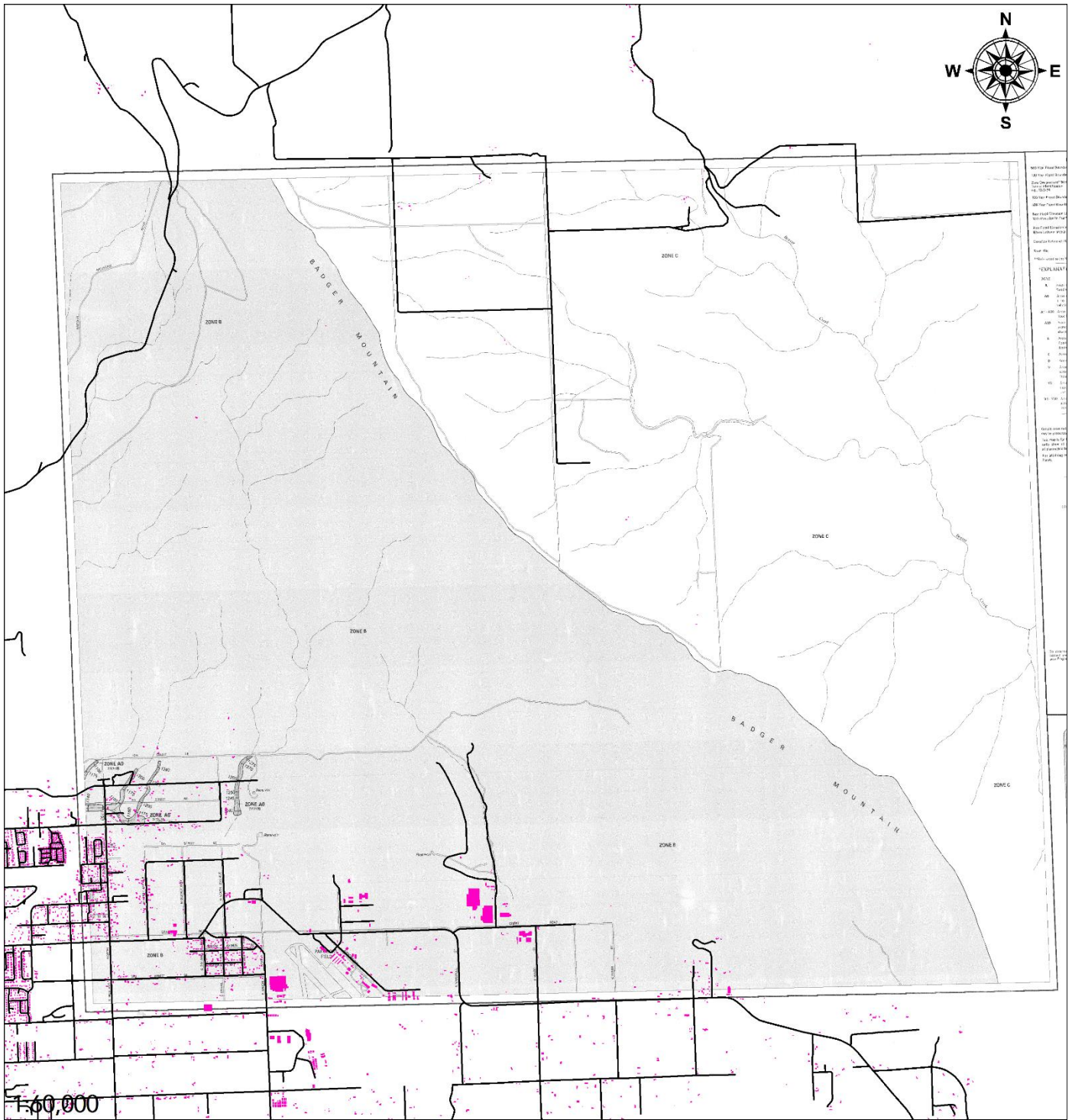
-  State Borders
-  County Borders
-  Municipal Borders
-  Structures
-  U.S. Highways
-  State Highways
-  Other Roads
-  Railways



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS



Map E.17 – FIRM Panel 5300360555A



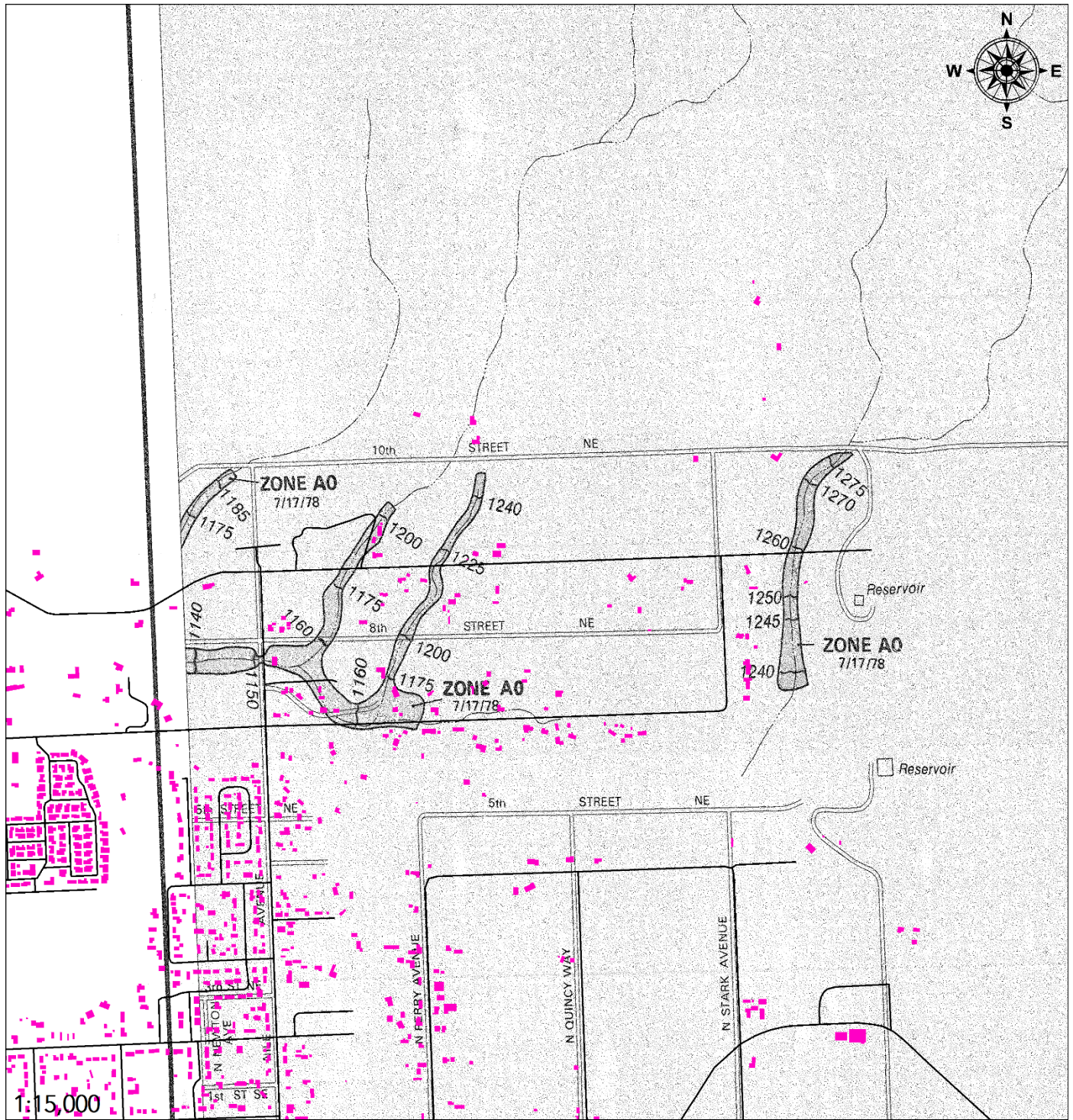
1:60,000  
0 0.3 0.6 1.2 1.8 Miles



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

-  State Borders
-  County Borders
-  Municipal Borders
-  Structures
-  U.S. Highways
-  State Highways
-  Other Roads
-  Railways

Map E.18 – FIRM Panel 5300360555A - 1



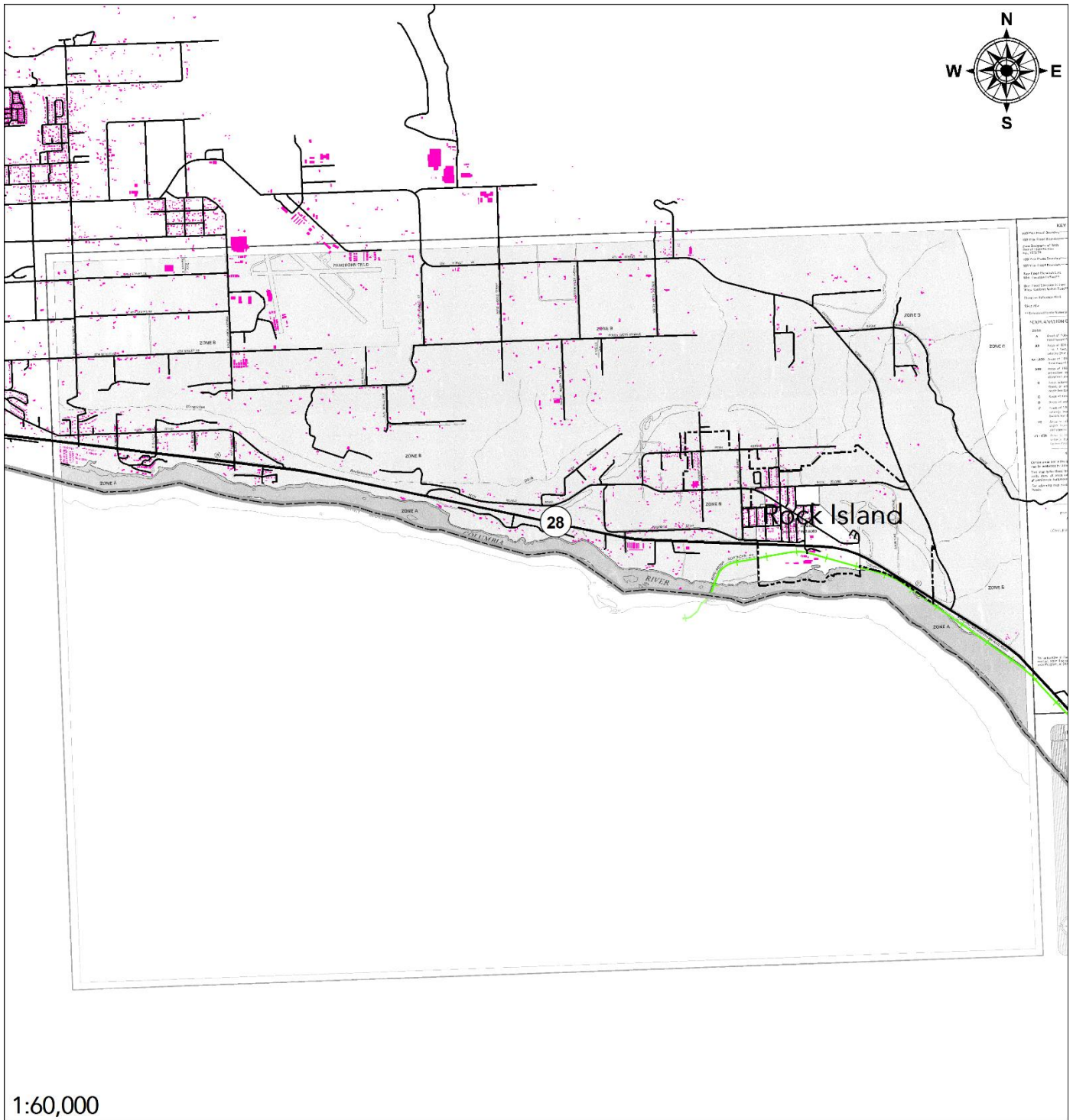
0 0.075 0.15 0.3 0.45 Miles



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

- State Borders
- County Borders
- Municipal Borders
- Structures
- U.S. Highways
- State Highways
- Other Roads
- Railways

Map E.19 – FIRM Panel 5300360565A

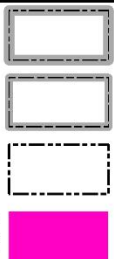


1:60,000

0 0.3 0.6 1.2 1.8 Miles



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS



State Borders

County Borders

Municipal Borders

Structures

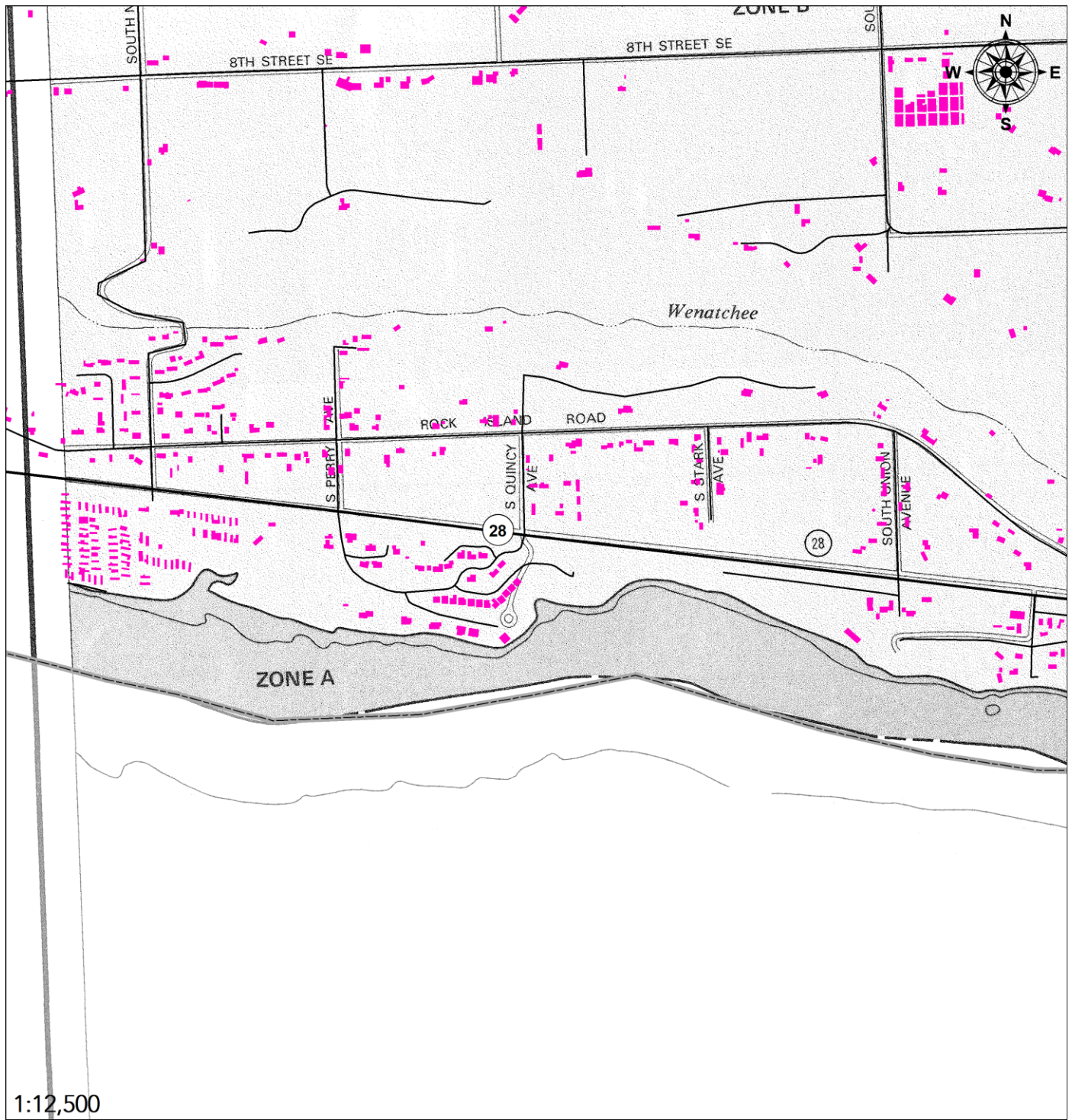
U.S. Highways

State Highways

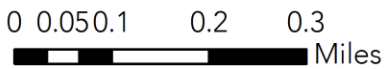
Other Roads





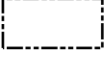



Railways

Map E.20 – FIRM Panel 5300360565A - 1



1:12,500

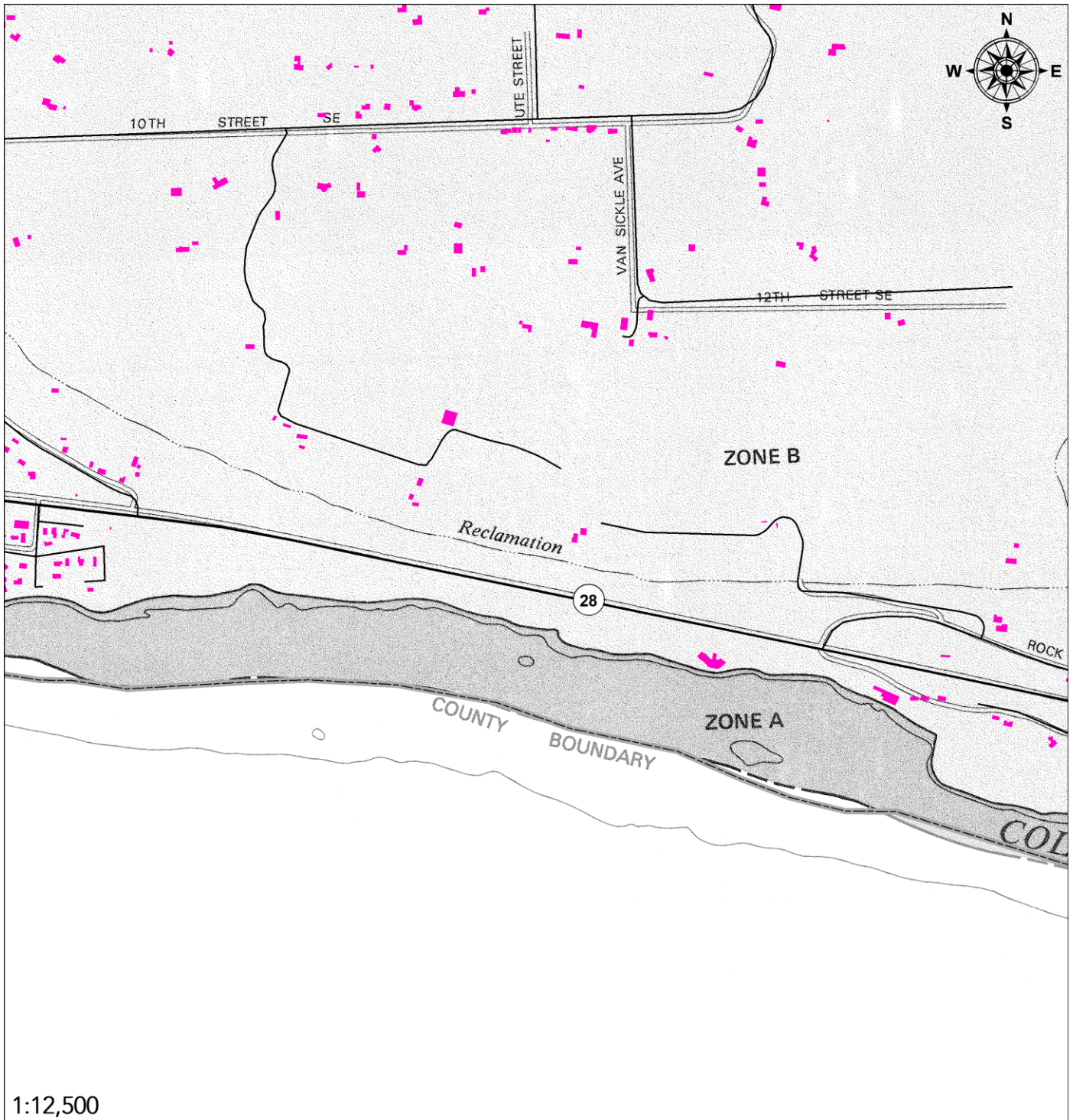


- |   |                   |   |                |
|---|-------------------|---|----------------|
|  | State Borders     |  | U.S. Highways  |
|  | County Borders    |  | State Highways |
|  | Municipal Borders |  | Other Roads    |
|  | Structures        |  | Railways       |

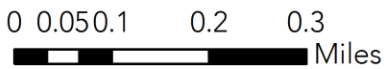


Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

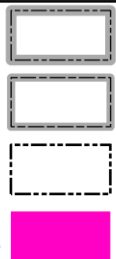
Map E.21 – FIRM Panel 5300360565A - 2



1:12,500



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS



State Borders

County Borders

Municipal Borders

Structures

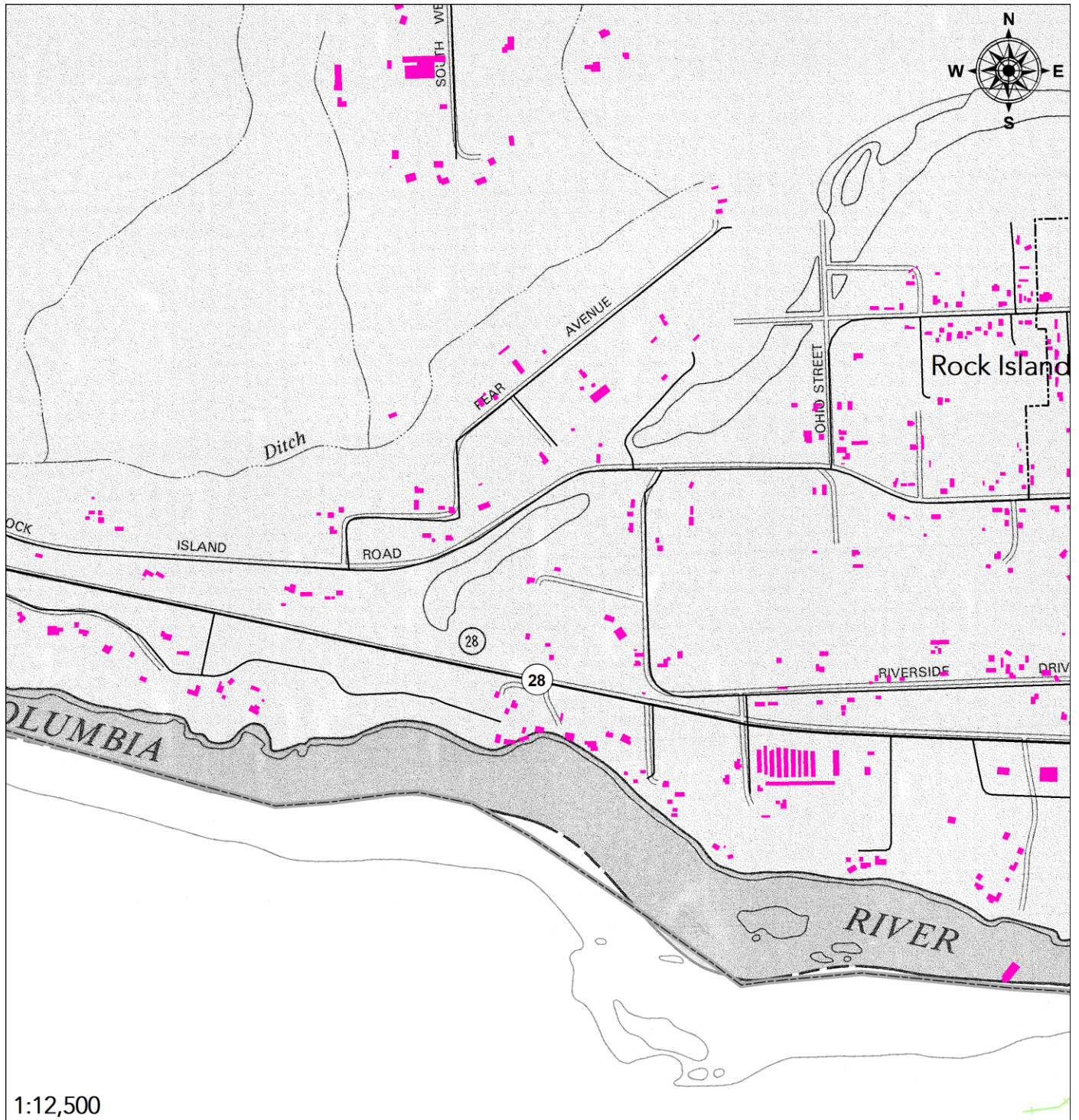
U.S. Highways

State Highways

Other Roads

Railways

Map E.22 – FIRM Panel 5300360565A - 3

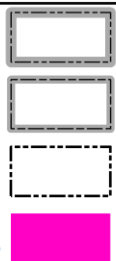


1:12,500

0 0.05 0.1 0.2 0.3  
Miles



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS



State Borders

County Borders

Municipal Borders

Structures

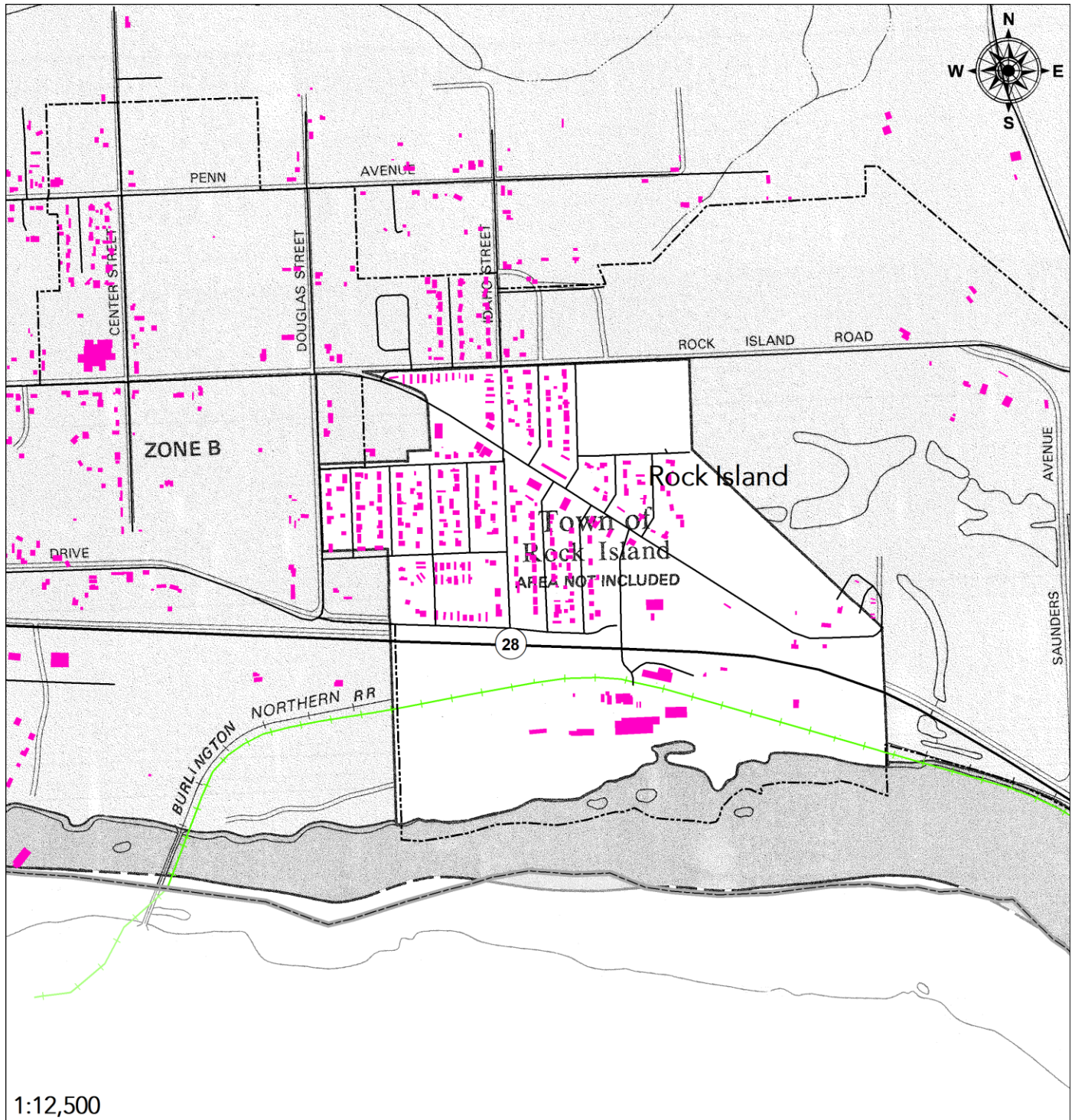
U.S. Highways

State Highways

Other Roads

Railways

Map E.23 – FIRM Panel 5300360565A - 4







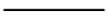



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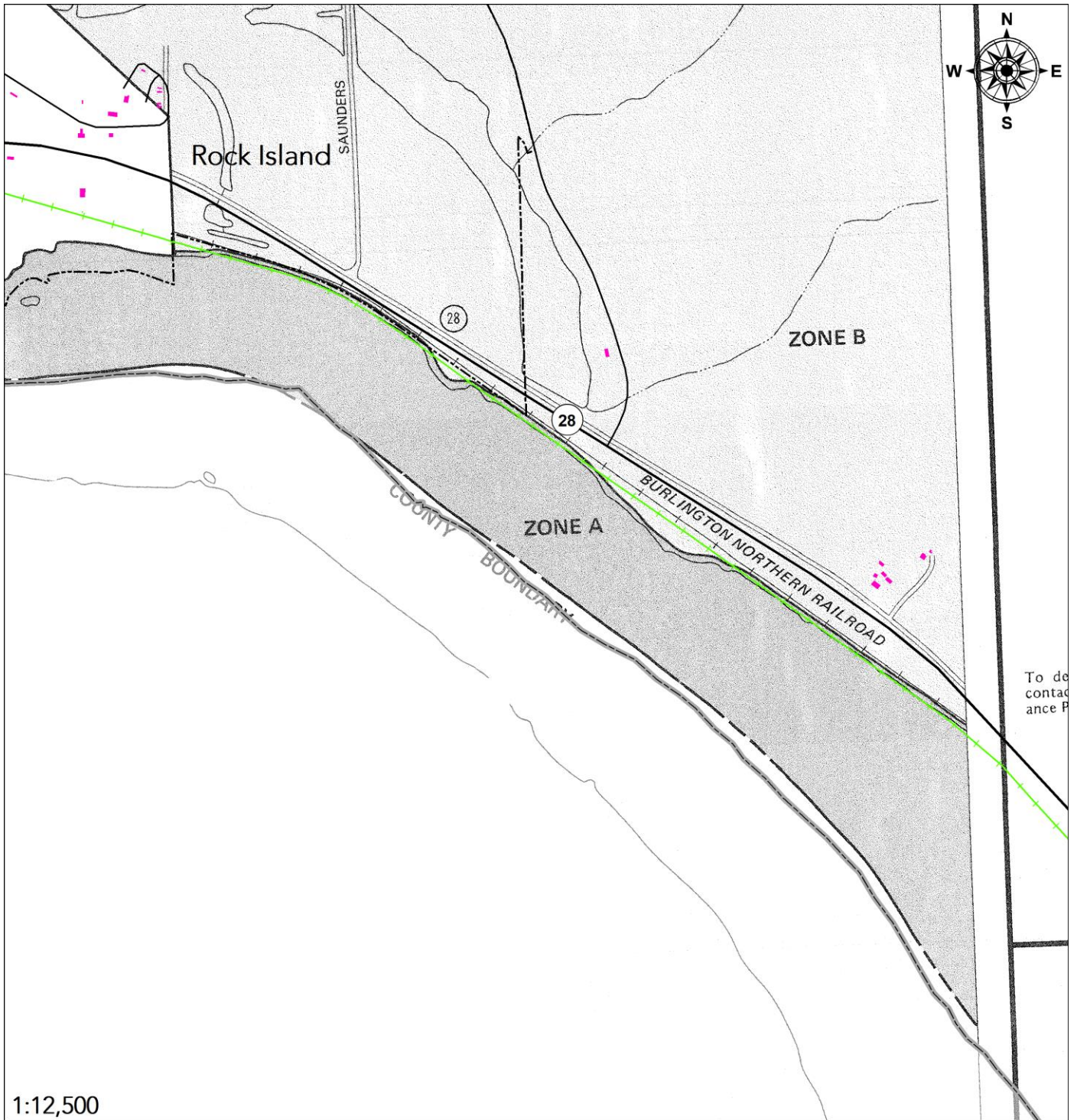
0 0.05 0.1 0.2 0.3 Miles



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

-  State Borders
-  County Borders
-  Municipal Borders
-  Structures
-  U.S. Highways
-  State Highways
-  Other Roads
-  Railways

Map E.24 – FIRM Panel 5300360565A - 5

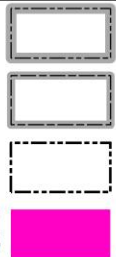


1:12,500

0 0.05 0.1 0.2 0.3 Miles



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS



State Borders

County Borders

Municipal Borders

Structures

U.S. Highways

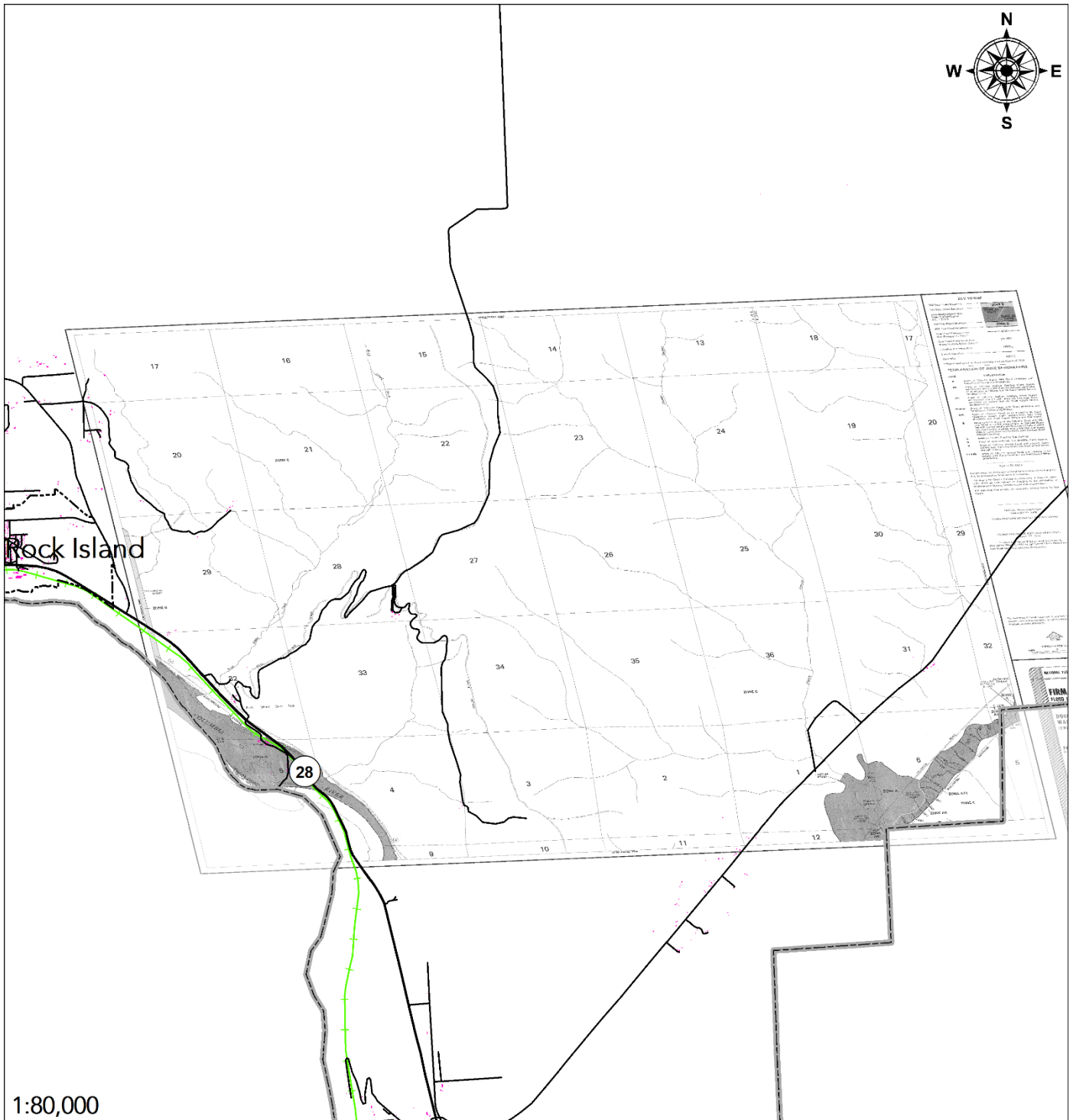
State Highways

Other Roads

Railways

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ance P

Map E.25 – FIRM Panel 5300360570B

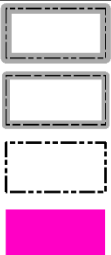


1:80,000

0 0.425 0.85 1.7 2.55 Miles



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS



State Borders

County Borders

Municipal Borders

Structures

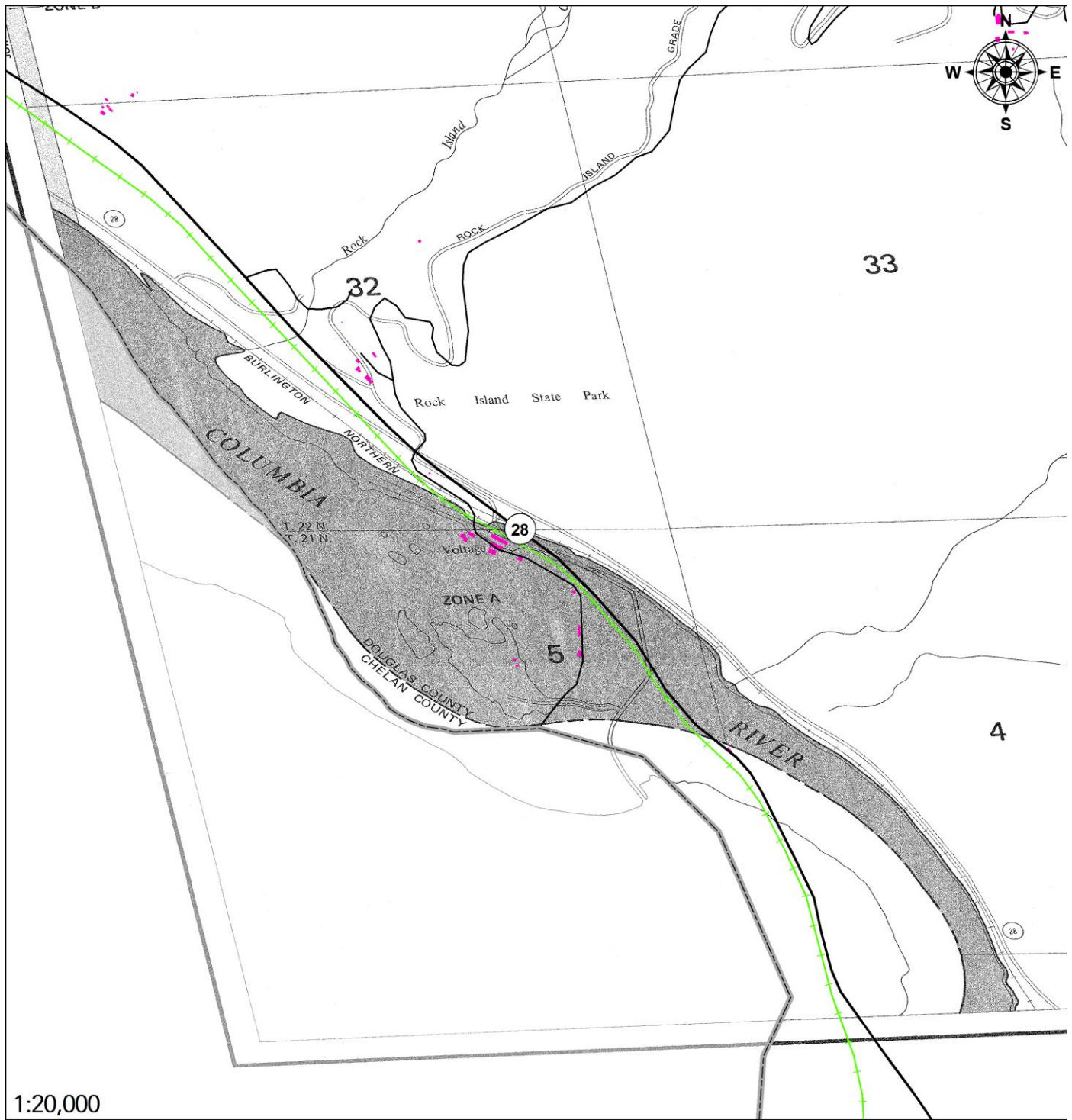
U.S. Highways

State Highways

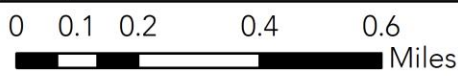
Other Roads

Railways



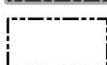


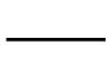
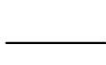

Map E.26 – FIRM Panel 5300360570B - 1



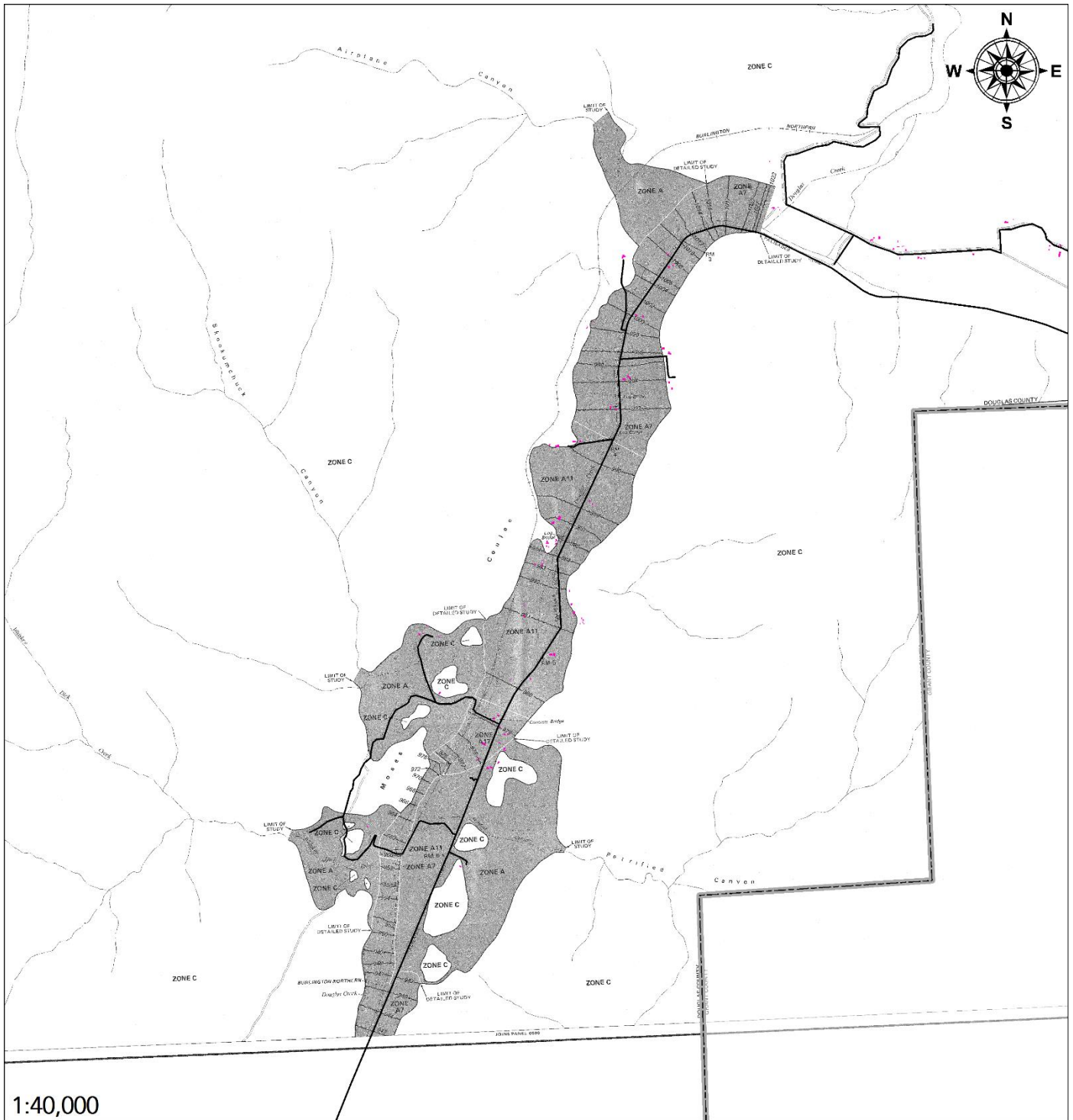
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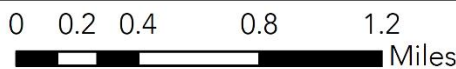
Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

-  State Borders
-  County Borders
-  Municipal Borders
-  Structures
-  U.S. Highways
-  State Highways
-  Other Roads
-  Railways

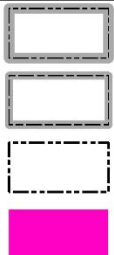
Map E.27 – FIRM Panel 5300360580B



1:40,000



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS



State Borders

County Borders

Municipal Borders

Structures

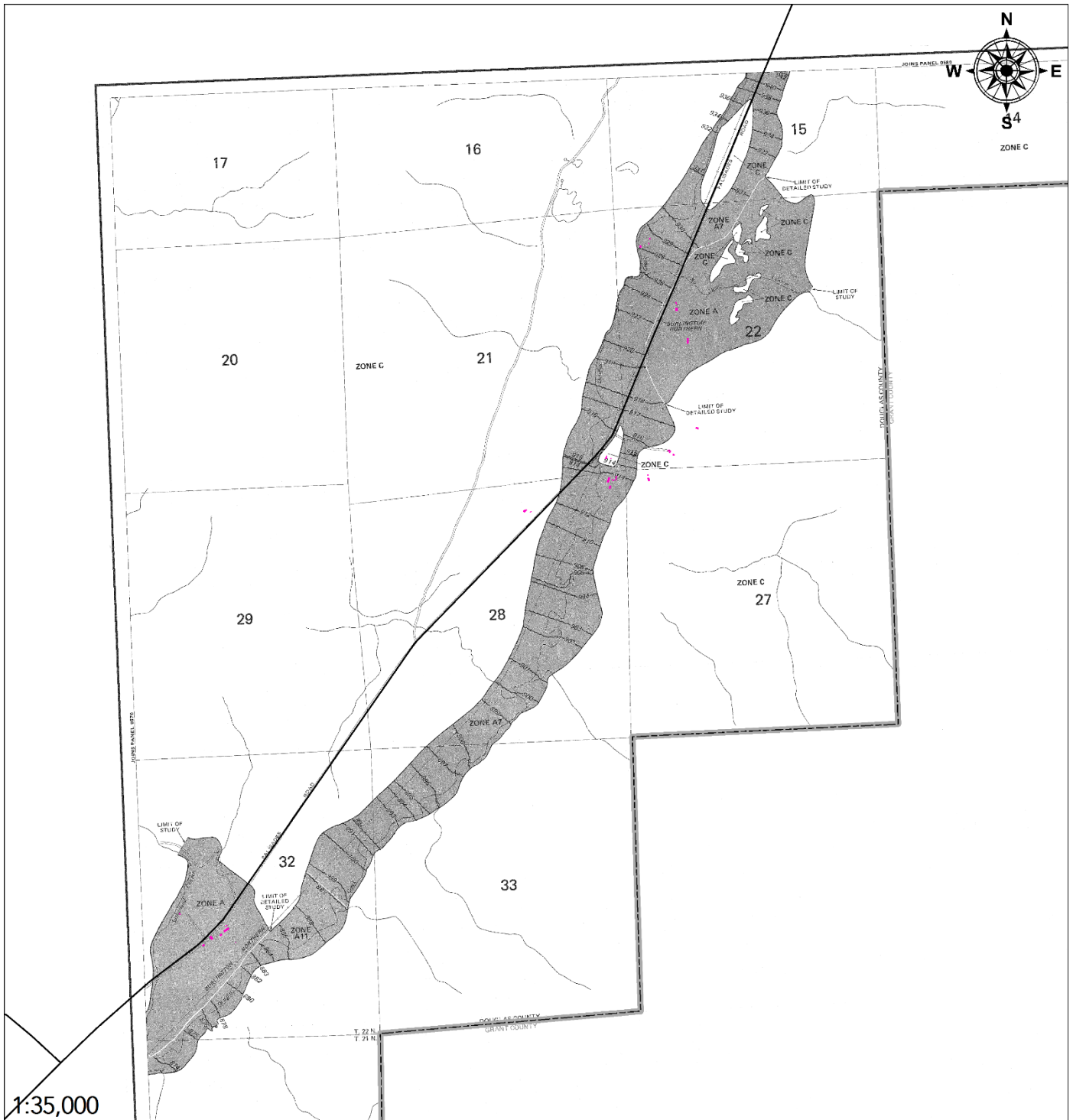
U.S. Highways

State Highways

Other Roads

Railways

Map E.28 – FIRM Panel 5300360590B










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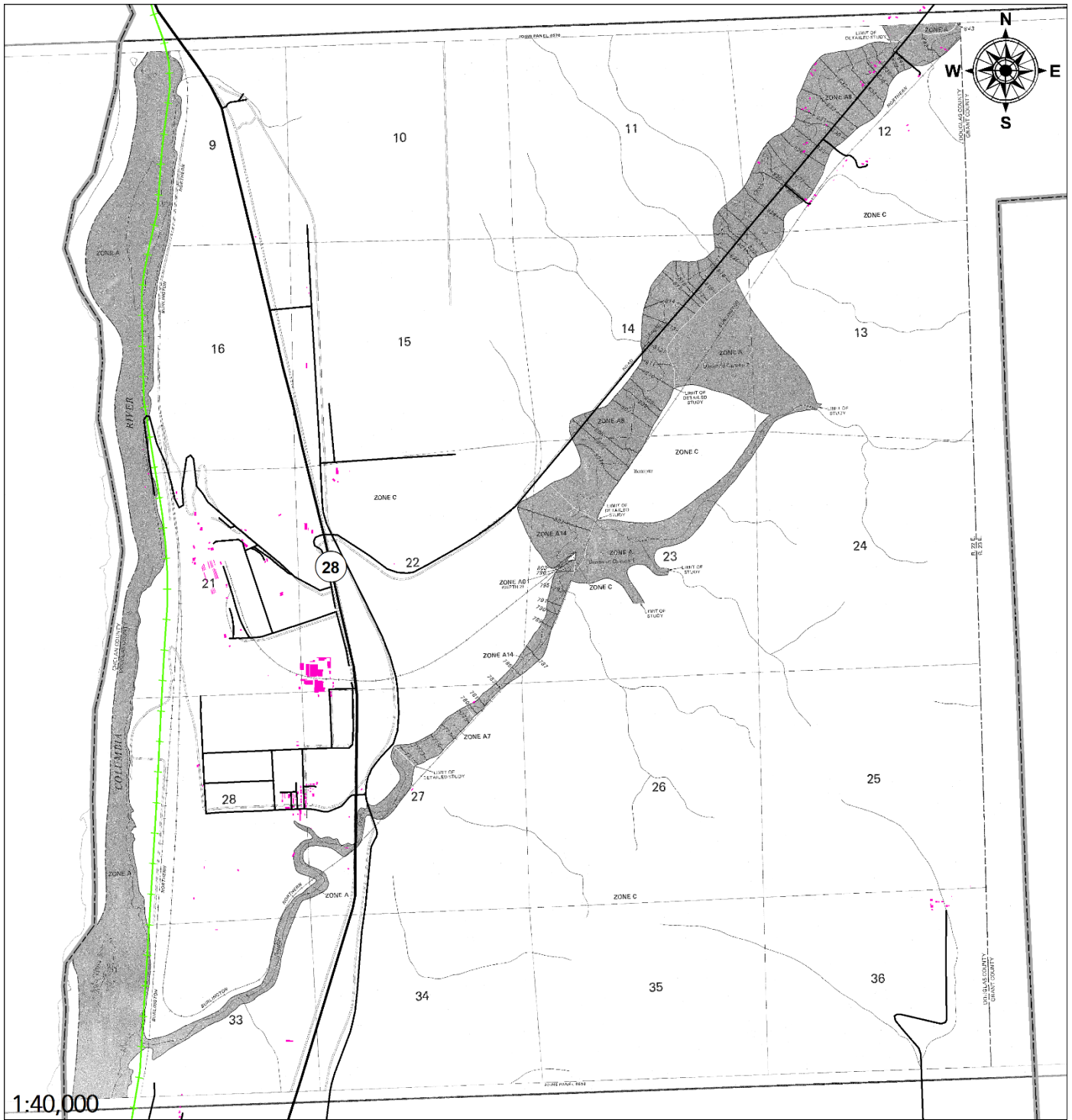
0 0.1750.35 0.7 1.05 Miles











Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

-  State Borders
-  County Borders
-  Municipal Borders
-  Structures
-  U.S. Highways
-  State Highways
-  Other Roads
-  Railways

Map E.29 – FIRM Panel 5300360635B



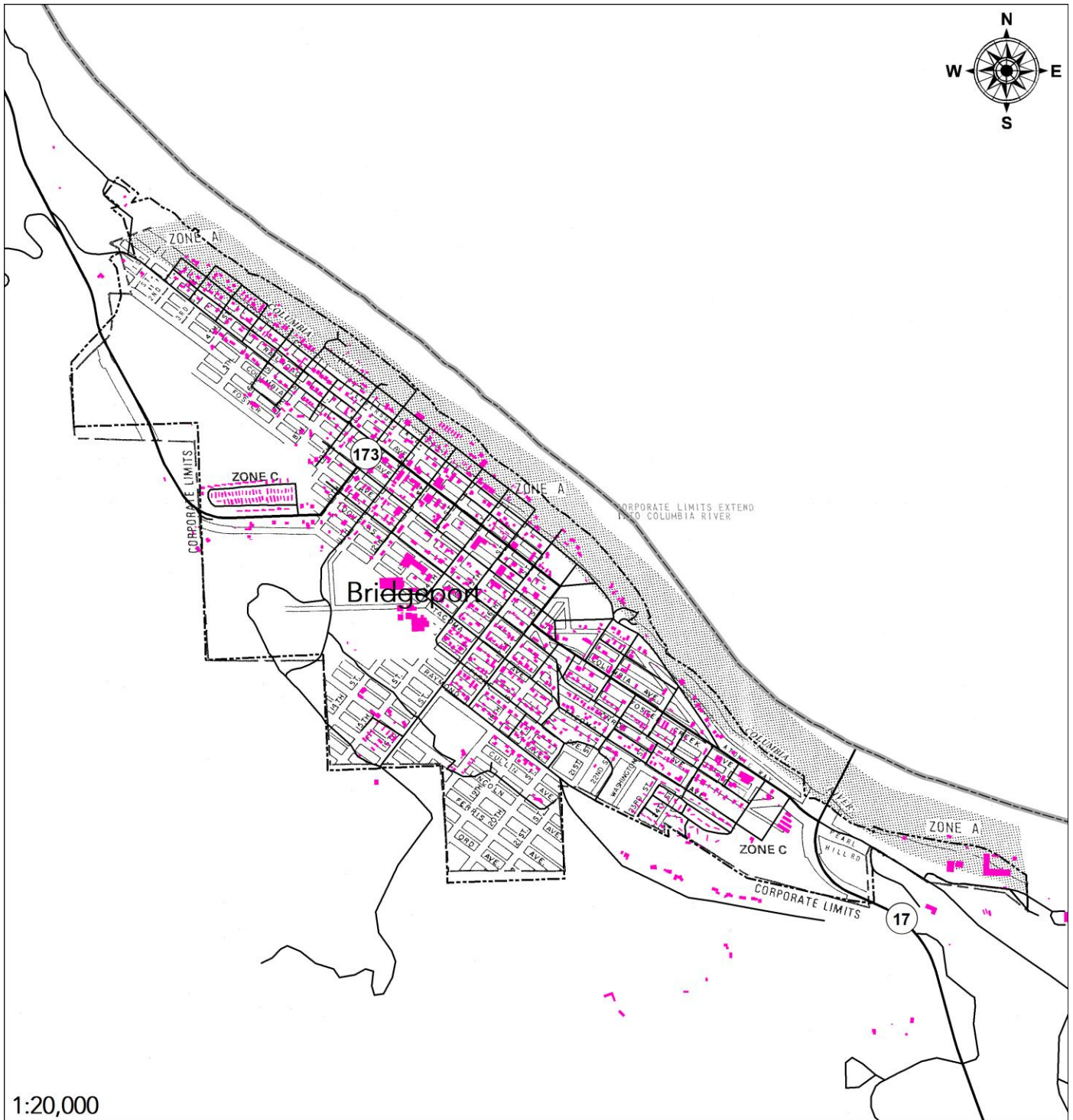
1:40,000  
 0 0.2 0.4 0.8 1.2 Miles

-  State Borders
-  County Borders
-  Municipal Borders
-  Structures
-  U.S. Highways
-  State Highways
-  Other Roads
-  Railways

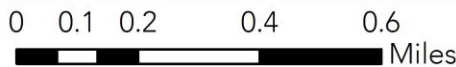


Data Sources: ESRI,  
 FEMA, Silvis Labs,  
 U.S. Census Bureau,  
 USDA, USGS

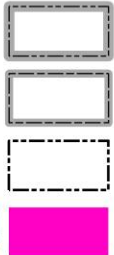
Map E.30 – FIRM Panel 5300370005B



1:20,000

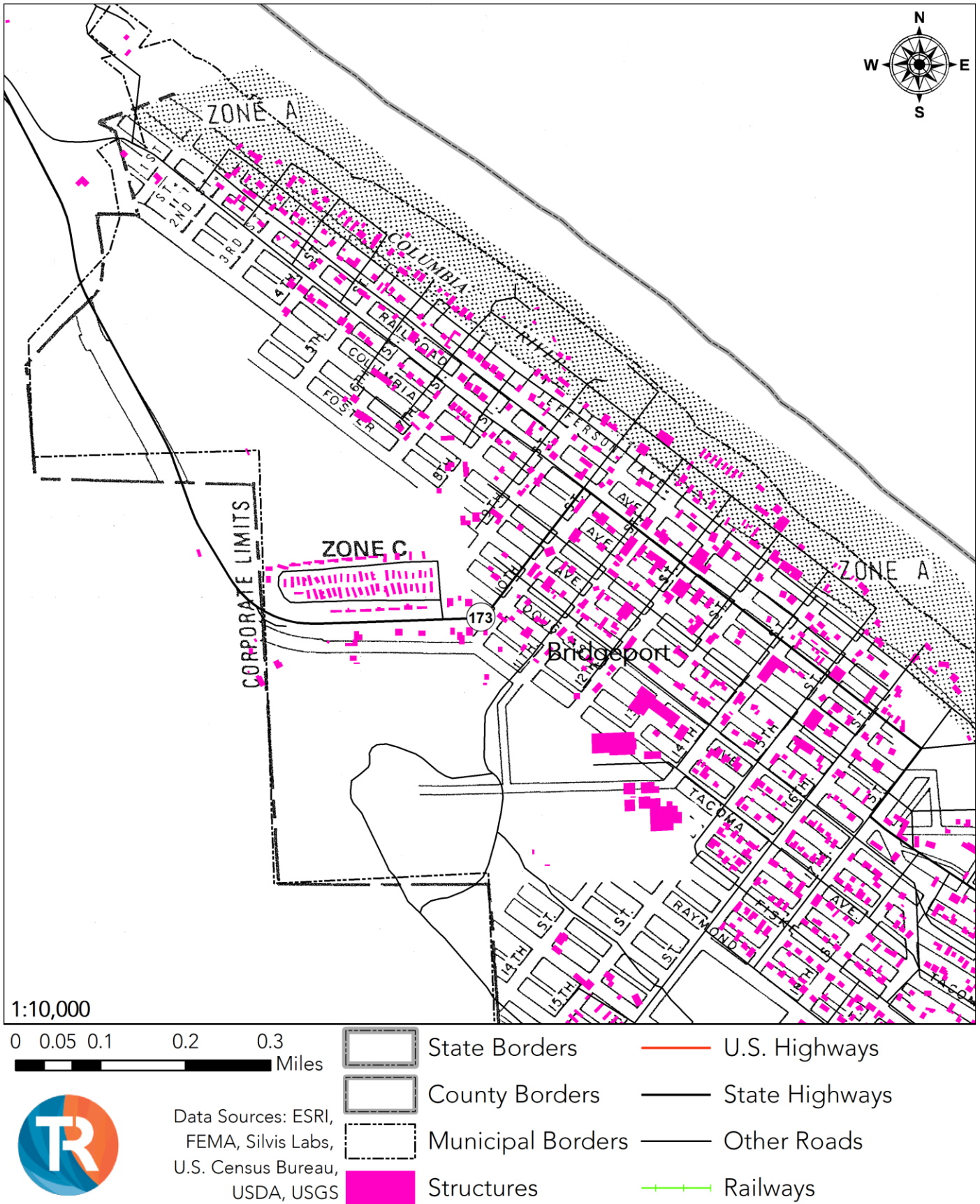


Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

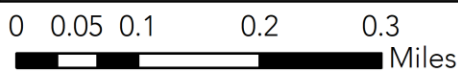
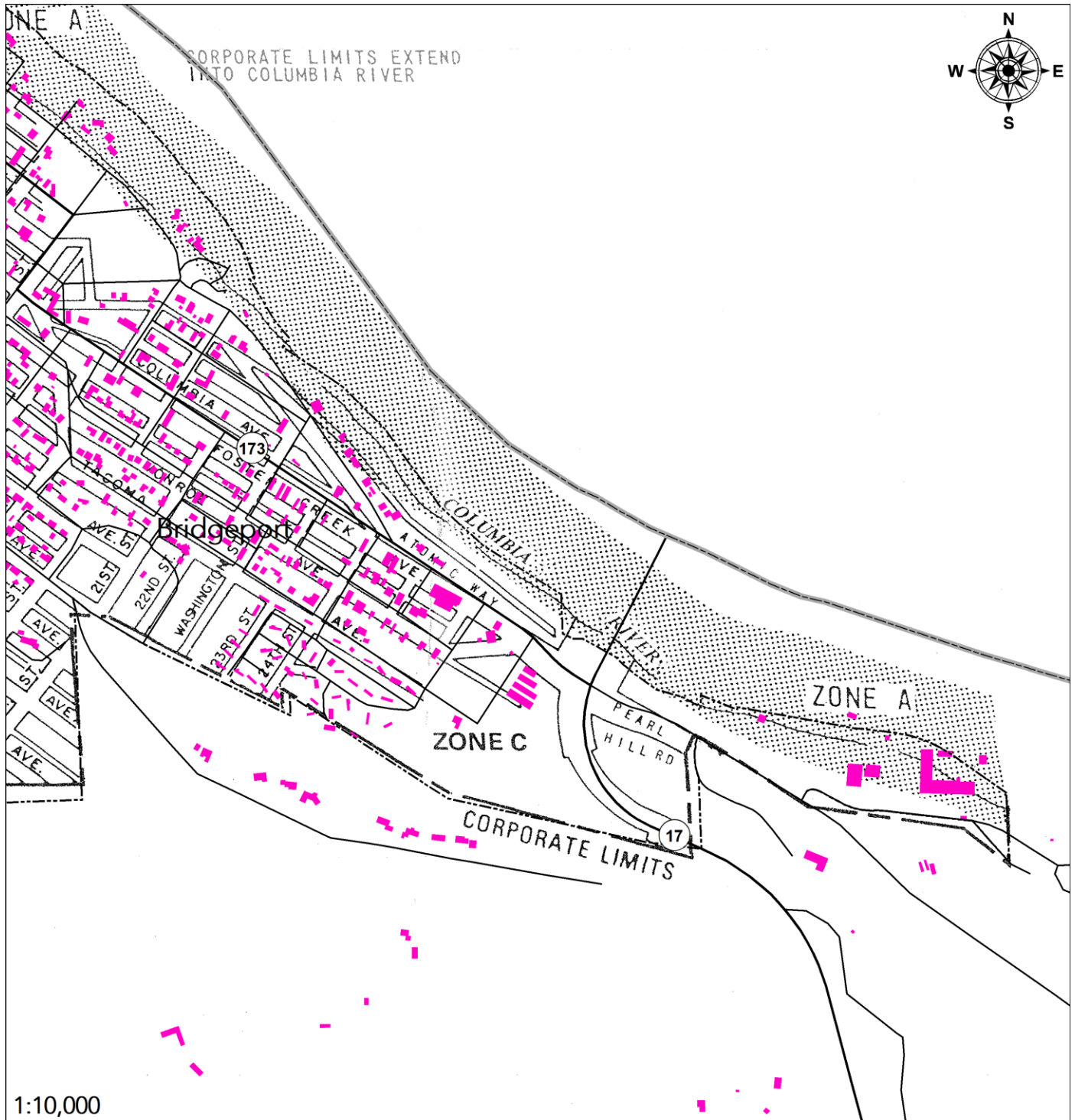


- State Borders
- County Borders
- Municipal Borders
- Structures
- U.S. Highways
- State Highways
- Other Roads
- Railways



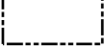





Map E.31 – FIRM Panel 5300370005B - 1



Map E.32 – FIRM Panel 5300370005B - 2

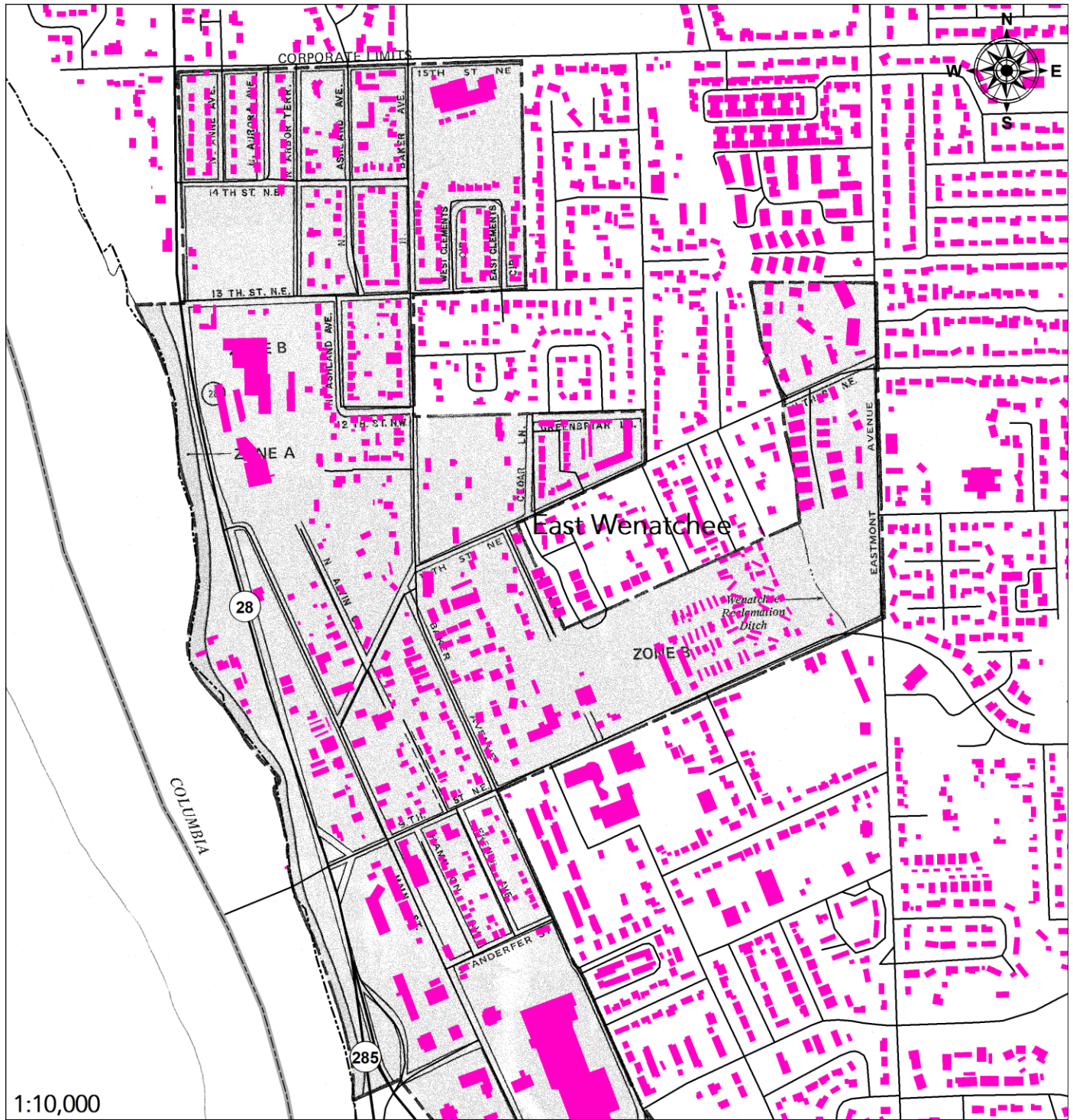


Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

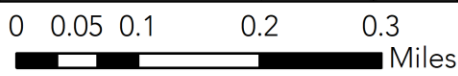
-  State Borders
-  County Borders
-  Municipal Borders
-  Structures
-  U.S. Highways
-  State Highways
-  Other Roads
-  Railways



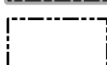


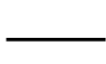
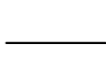



Map E.34 – FIRM Panel 5300380001C - 1



1:10,000



-  State Borders
-  County Borders
-  Municipal Borders
-  Structures
-  U.S. Highways
-  State Highways
-  Other Roads
-  Railways

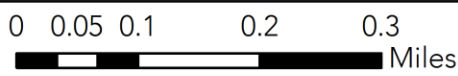


Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

Map E.34 – FIRM Panel 5300380001C - 2



1:10,000



Data Sources: ESRI,  
FEMA, Silvis Labs,  
U.S. Census Bureau,  
USDA, USGS

- State Borders
- County Borders
- Municipal Borders
- Structures
- U.S. Highways
- State Highways
- Other Roads
- Railways

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## Appendix F – Mitigation Actions & Projects

### Backup Generators

Backup generators provide critical facilities with electricity in the event a community's electrical transmission grid is either damaged by a disaster or overloaded by excessive use during an event.

|                           |   |
|---------------------------|---|
| <b>Hazard/s Addressed</b> | Dam Failures, Earthquakes, Floods, Landslides, Severe Storms, Tornadoes, Wildfires, Winter Storms |
| <b>Effectiveness</b>      | Medium  |
| <b>Timeframe</b>          | 1 – 2 Years   |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, Fire District Chiefs, School Board                         |
| <b>Funding Sources</b>    | HMGP, PDM, Local Budgets  |

### Bionets

Bionets installed in strategic locations will prevent the erosion of slopes subject to surface wash. The containment reinforcement of the exposed ground reduces the impact of heavy rain and mud.

|                           |   |
|---------------------------|---|
| <b>Hazard/s Addressed</b> | Landslides                                      |
| <b>Effectiveness</b>      | High  |
| <b>Timeframe</b>          | 1 – 3 Years                                     |
| <b>Lead Organization</b>  | Board of Commissioners, City Council, FCCD, PUD |
| <b>Funding Sources</b>    | HMGP, PDM, Local Budgets                        |

### Bury Utility Lines, Pipes, and Tanks

Transferring existing utilities lines, pipes, and chemical storage tanks from above ground to below ground will significantly reduce the amount of property damage incurred from wind, ice, and snow related events.

|                           |  |
|---------------------------|--|
| <b>Hazard/s Addressed</b> | Landslides, Severe Storms, Tornadoes, Wildfires, Winter Storms |
| <b>Effectiveness</b>      | Medium   |
| <b>Timeframe</b>          | 1 – 5 Years  |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, School Board, PUD       |
| <b>Funding Sources</b>    | HMGP, PDM, Local Budgets                                       |

### Dam Failure Evacuation Planning

Potentially affected plan partners will work with municipal governments and school boards to develop a comprehensive and flexible evacuation plan to address a catastrophic failure of any of the high hazard dams in the planning area.

|                           |  |
|---------------------------|--|
| <b>Hazard/s Addressed</b> | Dam Failures   |
| <b>Effectiveness</b>      | Medium   |
| <b>Timeframe</b>          | 1 – 2 Years  |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, Fire District Chiefs, School Board, PUD |
| <b>Funding Sources</b>    | Local Budgets  |

### Debris & Natural Fuels Reduction

Reducing the amount of debris and natural fuels in a community will deprive wildfires of the material it requires to spread and prevent high winds from launching deadly and damaging debris around during a severe storm or tornado. This project will be implemented in high risk areas as identified in this plan’s WUI maps and well-known to burn areas as determined by the participating jurisdictions and appropriate local agencies.

|                           |  |
|---------------------------|--|
| <b>Hazard/s Addressed</b> | Severe Storms, Tornadoes, Wildfires  |
| <b>Effectiveness</b>      | Medium   |
| <b>Timeframe</b>          | 1 Year   |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, FCCD, Fire District Chiefs, School Board, PUD |
| <b>Funding Sources</b>    | FP&S, HMGP, PDM, Local Budgets   |

### Defensible Spaces & Buffer Zones

Creating defensible spaces and buffer zones void of vegetative fuel and covered with gravel or rock helps prevent the spread of wildfire as well as creating an area in which local emergency response serviced can safely operate. This 2-pronged approach directly mitigates damage to property and protects lives, but also indirectly mitigates the threat to life and property in the area at large. This project will be implemented in high risk areas as identified in this plan’s WUI maps and well-known to burn areas as determined by the participating jurisdictions and appropriate local agencies.

|                           |  |
|---------------------------|--|
| <b>Hazard/s Addressed</b> | Wildfires  |
| <b>Effectiveness</b>      | Medium   |
| <b>Timeframe</b>          | 1 Year   |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, FCCD, Fire District Chiefs, School Board, PUD |
| <b>Funding Sources</b>    | FP&S, HMGP, PDM, Local Budgets   |

### Earthquake Assessment & Retrofit

An earthquake vulnerability assessment will detail a jurisdiction’s high-risk facilities, infrastructure, and make retrofit recommendations. Using the assessment, a jurisdiction can retrofit their facilities and infrastructure there by reducing their structural vulnerabilities to seismic events.

|                           |   |
|---------------------------|---|
| <b>Hazard/s Addressed</b> | Earthquakes   |
| <b>Effectiveness</b>      | High  |
| <b>Timeframe</b>          | 1 – 5 Years   |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, Fire District Chiefs, School Board |
| <b>Funding Sources</b>    | HMGP, PDM, Local Budgets  |

### Elevate Structures

Structures located within identified flood zones can be elevated above base flood elevation or predicted other predicted flood inundation levels.

|                           |   |
|---------------------------|---|
| <b>Hazard/s Addressed</b> | Dam Failures, Floods                                |
| <b>Effectiveness</b>      | High  |
| <b>Timeframe</b>          | 1 – 3 Years   |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, School Board |
| <b>Funding Sources</b>    | FMA, HMGP, PDM, Local Budgets                       |

### FEMA Code 361 Safe Rooms

FEMA Code 361 regulations ensure a structure is capable of withstanding wind speeds greater than 200 miles per hour. Additionally, these anti-tornado regulations also ensure the structure is protected against hail, lightning, high and strong winds. This project can be implemented as a retrofit of a current structure or the construction of a new facility. Any critical facility is a potential target for this, but realistically location will be determined by which participating jurisdictions have the want and resources to accomplish this project.

|                           |   |
|---------------------------|---|
| <b>Hazard/s Addressed</b> | Severe Storms, Tornadoes                            |
| <b>Effectiveness</b>      | High  |
| <b>Timeframe</b>          | 1 – 3 Years   |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, School Board |
| <b>Funding Sources</b>    | HMGP, PDM, Local Budgets                            |

### Floodproofing

This technique is often used when relocation or buying out is not an option as is the case with a historic building or it would require astronomical funding that is not available. Floodproofing projects constitute any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage. Wet floodproofing reduces property damage counteracting hydrostatic pressure on walls or other support structures by equalizing the pressure between the interior and exterior of a structure.

|                           |   |
|---------------------------|---|
| <b>Hazard/s Addressed</b> | Dam Failures, Floods                                |
| <b>Effectiveness</b>      | Medium  |
| <b>Timeframe</b>          | 1 – 3 Years   |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, School Board |
| <b>Funding Sources</b>    | FMA, HMGP, PDM, Local Budgets                       |

### Insulation & Energy Efficiency

Upgrading a facility's windows, windows frames, roofing, and insulation will allow it to better maintain a desired warm or cool temperature during prolonged extreme heat or winter storms. Additionally, it decreases the energy load necessary to do so, decreasing the burden on the local energy grid.

|                           |   |
|---------------------------|---|
| <b>Hazard/s Addressed</b> | Winter Storms                                       |
| <b>Effectiveness</b>      | Low   |
| <b>Timeframe</b>          | 1 – 3 Years   |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, School Board |
| <b>Funding Sources</b>    | HMGP, PDM, Local Budgets                            |

### Interior Furnishing Hazard Reduction

Fastening, removing, or modifying interior furnishing prevent them from shaking, becoming unstable, or falling loose into people and other objects during seismic events.

|                           |   |
|---------------------------|---|
| <b>Hazard/s Addressed</b> | Earthquakes   |
| <b>Effectiveness</b>      | Low   |
| <b>Timeframe</b>          | 1 – 2 Years   |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, Fire District Chiefs, School Board |
| <b>Funding Sources</b>    | HMGP, PDM, Local Budgets  |

### Looped Grid Power Systems

Linear power grids have single points of failure that are vulnerable to a number of hazards. Looped power grids operate in parallel and are thus significantly more resistant to damage allowing the utilities to maintain power after an event.

|                           |   |
|---------------------------|---|
| <b>Hazard/s Addressed</b> | Dam Failures, Earthquakes, Floods, Landslides, Severe Storms, Tornadoes, Wildfires, Winter Storms |
| <b>Effectiveness</b>      | Medium  |
| <b>Timeframe</b>          | 1 – 5 Years   |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, School Board, PUD  |
| <b>Funding Sources</b>    | HMGP, PDM, Local Budgets  |

### Low Flow Utilities

To decrease water usage before, during, and after a drought, communities can install low water flow utilities throughout its critical facilities and infrastructure. This will not only decrease water usage, but also decrease water demands. The planning area should implement this project in conjunction with their school districts and critical facilities standard maintenance cycles.

|                           |   |
|---------------------------|---|
| <b>Hazard/s Addressed</b> | Droughts                                    |
| <b>Effectiveness</b>      | Low   |
| <b>Timeframe</b>          | 1 – 2 Years                                 |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, FCCD |
| <b>Funding Sources</b>    | HMGP, PDM, Local Budgets                    |

### Public Awareness & Education

A campaign will inform and educate the public on hazard risks, allowing them to better protect their property through preparation and their lives through appropriate evacuation and survival procedures.

|                           |   |
|---------------------------|---|
| <b>Hazard/s Addressed</b> | Dam Failures, Droughts, Earthquakes, Floods, Landslides, Severe Storms, Tornadoes, Wildfires, Winter Storms |
| <b>Effectiveness</b>      | Low   |
| <b>Timeframe</b>          | 1 Year  |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, FCCD, Fire District Chiefs, School Board, PUD                        |
| <b>Funding Sources</b>    | N/A   |

### Rainwater Retention Basins

Rainwater retention basins are artificial basins built in strategic locations to protect against floods and droughts by collecting and holding rainwater for an extended period of time. The participating jurisdictions should implement these installations in areas where the water can be used during a drought, for agricultural or urban use, or in areas where poor functioning, outdated, or old stormwater drainage systems are in place.

|                           |   |
|---------------------------|---|
| <b>Hazard/s Addressed</b> | Droughts, Floods  |
| <b>Effectiveness</b>      | Low   |
| <b>Timeframe</b>          | 1 – 4 Years   |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, FCCD, Fire District Chiefs, School Board |
| <b>Funding Sources</b>    | FMA, HMGP, PDM, Local Budgets   |

### Raise Transportation Infrastructure

To combat uncontrollable waters emanating from a dam or levee failure, flash flood, or riverine flood, transportation infrastructure may be raised to allow its continued use in a disaster as well as a partial earthen berm to protect a neighboring lower elevation area. Additionally, the increased elevation of road or railway bridges can prevent the buildup of debris during incidents of high floodwaters and preventing further water buildup.

|                           |                                       |
|---------------------------|---------------------------------------|
| <b>Hazard/s Addressed</b> | Dam Failures, Floods                  |
| <b>Effectiveness</b>      | High                                  |
| <b>Timeframe</b>          | 1 – 5 Years                           |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils |
| <b>Funding Sources</b>    | FMA, HMGP, PDM, Local Budgets         |

### Relocate or Buyout Vulnerable Structures

Some structures may be able to be relocated from identified floodplains, landslides areas, high liquefaction soils, or dam inundation zones. Removing them from identified hazard area will eliminate their risk.

|                           |   |
|---------------------------|---|
| <b>Hazard/s Addressed</b> | Dam Failures, Earthquakes, Floods, Landslides       |
| <b>Effectiveness</b>      | High  |
| <b>Timeframe</b>          | 1 – 5 Years   |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, School Board |
| <b>Funding Sources</b>    | FMA, HMGP, PDM, Local Budgets                       |

### SKYWARN Storm Spotter Training

The NWS’ SKYWARN Storm Spotter training program educates and delivers basic weather identification, spotting, and reporting information to any concerned citizens. Educating citizens in this program helps increase specific awareness and creates a skillset that helps the NWS create more accurate and timely warnings for tornadoes, severe storms, flash flooding, and other severe weather.

|                           |   |
|---------------------------|---|
| <b>Hazard/s Addressed</b> | Floods, Severe Storms, Tornadoes, Winter Storms |
| <b>Effectiveness</b>      | Low   |
| <b>Timeframe</b>          | 1 – 2 Years                                     |
| <b>Lead Organization</b>  | FCCD, Fire District Chiefs, PUD                 |
| <b>Funding Sources</b>    | Local Budgets                                   |

### Slope Reinforcement & Modification

Identified hazard areas considered to be high risk will be the subject of slop modification measures. These measures will vary depending on location specifics, but could include slop modification, earth removal, or retaining wall installation.

|                           |  |
|---------------------------|--|
| <b>Hazard/s Addressed</b> | Landslides                                       |
| <b>Effectiveness</b>      | High   |
| <b>Timeframe</b>          | 1 – 5 Years                                      |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, FCCD, PUD |
| <b>Funding Sources</b>    | HMGP, PDM, Local Budgets                         |

### Snow Fences

Snow fences force drifting snow to accumulate in a desired place minimizing the amount of snowdrift on roads and railways. Controlling snow accumulation decreases the danger to a jurisdiction's citizens traveling during and after a winter storm. This project should be implemented along major transportation routes throughout the planning area.

|                           |  |
|---------------------------|--|
| <b>Hazard/s Addressed</b> | Winter Storms  |
| <b>Effectiveness</b>      | Low  |
| <b>Timeframe</b>          | 1 – 2 Years  |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, School Board, PUD |
| <b>Funding Sources</b>    | HMGP, PDM, Local Budgets                                 |

### Storm Water Drainage System Upgrade

Significant flood damage in developed communities can be prevented by upgrading their storm water drainage system. This mitigation measure will allow flood waters to drain quicker and prevent excess accumulation. This project should be implemented in older drainage systems and any expanding areas throughout the planning area.

|                           |                                       |
|---------------------------|---------------------------------------|
| <b>Hazard/s Addressed</b> | Floods                                |
| <b>Effectiveness</b>      | Medium                                |
| <b>Timeframe</b>          | 1 – 4 Years                           |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils |
| <b>Funding Sources</b>    | FMA, HMGP, PDM, Local Budgets         |

### Storm Water Pump Stations

Storm water pump stations help protect areas by pumping away large volumes of water therefore preventing or decreasing the level of a flood. Pump stations can vary in size and design, allowing them to be tailored to the needs of a specific floodplain, region, or site-specific facility.

|                           |                                       |
|---------------------------|---------------------------------------|
| <b>Hazard/s Addressed</b> | Floods                                |
| <b>Effectiveness</b>      | Medium                                |
| <b>Timeframe</b>          | 1 – 4 Years                           |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils |
| <b>Funding Sources</b>    | FMA, HMGP, PDM, Local Budgets         |

### Storm Siren Network Expansion

The jurisdiction will continue to improve their alert, broadcast, and warning systems to give information and instructions in the face of an impending hazard impact to prevent injury and property damage. These systems will allow citizens to better protect themselves in the event of an impending or potentially impending hazard. Additionally, hazard or weather specific information can be delivered to assist in achieving the previously stated goal.

|                           |  |
|---------------------------|--|
| <b>Hazard/s Addressed</b> | Dam Failures, Floods, Severe Storms, Tornadoes, Wildfires, Winter Storms |
| <b>Effectiveness</b>      | Medium   |
| <b>Timeframe</b>          | 1 – 4 Years  |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils                                    |
| <b>Funding Sources</b>    | HMGP, PDM, Local Budgets   |

### Structural Integrity Monitoring Instruments

Dam failure is often preventable, but due to the structural nature of their construction and limited inspection resources, inspections happen too infrequently. Installing a series of seismic monitoring instruments at strategic locations along a dam can detect small, often unnoticed or detected, shifts in the dam’s substructure that are the primary cause in premature collapse or failure. These instruments serve not only as early warning devices, but as the means to ensuring a dam’s maintenance and repair schedule is kept.

|                           |   |
|---------------------------|---|
| <b>Hazard/s Addressed</b> | Dam Failures  |
| <b>Effectiveness</b>      | Medium  |
| <b>Timeframe</b>          | 1 Year  |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, School Board |
| <b>Funding Sources</b>    | HMGP, PDM, Local Budgets                            |

### Transportation Status & Routing System

Installing a transportation status and routing system will allow a community to effectively mitigate the effects of multiple hazards on its travelling population. Using smart grid and intelligent transit control systems, a jurisdiction can effectively route its transportation systems according to situational need whether it is to avoid severe weather, flooding, dam failure, wildfires or any number of hazards. By having a better control of its transportation network, and thus the location of its citizens, a community detour its citizens from entering into the harm of a hazard. This project should be a planning area wide implementation of all major and heavily used transportation networks.

|                           |  |
|---------------------------|--|
| <b>Hazard/s Addressed</b> | Dam Failure, Earthquakes, Floods, Landslides, Severe Storms, Tornadoes, Wildfires, Winter Storms |
| <b>Effectiveness</b>      | Medium   |
| <b>Timeframe</b>          | 1 – 5 Years  |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils  |
| <b>Funding Sources</b>    | HMGP, PDM, Local Budgets   |

### Water Line Insulation

Insulating a facility’s water pipes helps prevent them from freezing and bursting due to sudden and prolonged low temperatures during winter storms. The planning area should implement this project in conjunction with their school districts and critical facilities standard maintenance cycles.

|                           |   |
|---------------------------|---|
| <b>Hazard/s Addressed</b> | Winter Storms                                       |
| <b>Effectiveness</b>      | Low   |
| <b>Timeframe</b>          | 1 Year  |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, School Board |
| <b>Funding Sources</b>    | HMGP, PDM, Local Budgets                            |

### Wildfire Structural Retrofit

Retrofitting structures with screened vent enclosures, double paned glass, and spark arrestors will reduce the chances of a structure igniting from a wildfire as well as a wildfire’s chance of spreading.

|                           |   |
|---------------------------|---|
| <b>Hazard/s Addressed</b> | Wildfires   |
| <b>Effectiveness</b>      | Medium  |
| <b>Timeframe</b>          | 1 – 2 Years   |
| <b>Lead Organization</b>  | Board of Commissioners, City Councils, Fire District Chiefs, School Board |
| <b>Funding Sources</b>    | FP&S, HMGP, PDM, Local Budgets  |

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# Appendix G – Project Prioritization

Table G.1 – Action & Project Prioritization, Douglas County

| Project/Action                              | Dam Failure | Droughts | Earthquakes | Floods | Landslides | Severe Storms | Tornadoes | Wildfires | Winter Storms |
|---|-------------|----------|-------------|--------|------------|---------------|-----------|-----------|---------------|
| Backup Generators                           | Low         |          | Medium      | Medium | Low        | Medium        | Low       | High      | Low           |
| Bionets                                     |             |          |             |        | Low        |               |           |           |               |
| Bury Utility Lines, Pipes, and Tanks        |             |          |             |        | Low        | Medium        | Low       | High      | Low           |
| Dam Failure Evacuation Planning             | Low         |          |             |        |            |               |           |           |               |
| Debris & Natural Fuels Reduction            |             |          |             |        |            | Medium        | Low       | High      |               |
| Defensible Spaces & Buffer Zones            |             |          |             |        |            |               |           | High      |               |
| Earthquake Assessment & Retrofit            |             |          | Medium      |        |            |               |           |           |               |
| Elevate Structures                          | Low         |          |             | Medium |            |               |           |           |               |
| FEMA Code 361 Safe Rooms                    |             |          |             |        |            | Medium        | Low       |           |               |
| Floodproofing                               | Low         |          |             | Medium |            |               |           |           |               |
| Insulation & Energy Efficiency              |             |          |             |        |            |               |           |           | Low           |
| Interior Furnishing Hazard Reduction        |             |          | Medium      |        |            |               |           |           |               |
| Looped Grid Power Systems                   | Low         |          | Medium      | Medium | Low        | Medium        | Low       | High      | Low           |
| Low Flow Utilities                          |             | Medium   |             |        |            |               |           |           |               |
| Public Awareness & Education                | Low         | Medium   | Medium      | Medium | Low        | Medium        | Low       | High      | Low           |
| Rainwater Retention Basins                  |             | Medium   |             | Medium |            |               |           |           |               |
| Raise Transportation Infrastructure         | Low         |          |             | Medium |            |               |           |           |               |
| Relocate or Buyout Vulnerable Structures    | Low         |          | Medium      | Medium | Low        |               |           |           |               |
| SKYWARN Storm Spotter Training              |             |          |             | Medium |            | Medium        | Low       |           | Low           |
| Slope Reinforcement & Modification          |             |          |             |        | Low        |               |           |           |               |
| Snow Fences                                 |             |          |             |        |            |               |           |           | Low           |
| Storm Water Drainage System Upgrade         |             |          |             | Medium |            |               |           |           |               |
| Storm Water Pump Stations                   |             |          |             | Medium |            |               |           |           |               |
| Storm Siren Network Expansion               | Low         |          |             | Medium |            | Medium        | Low       | High      | Low           |
| Structural Integrity Monitoring Instruments | Low         |          |             |        |            |               |           |           |               |
| Transportation Status & Routing Systems     | Low         |          | Medium      | Medium | Medium     | Medium        | Low       | High      | Low           |
| Water Line Insulation                       |             |          |             |        |            |               |           |           | Low           |
| Wildfire Structural Retrofit                |             |          |             |        |            |               |           | High      |               |

= Hazard or Project Not Applicable to this Plan Participant  
 = Mitigation Project or Action Not Applicable to this Hazard

Table G.2 – Action & Project Prioritization, Bridgeport

| Project/Action                              | Dam Failure | Droughts | Earthquakes | Floods | Landslides | Severe Storms | Tornadoes | Wildfires | Winter Storms |
|---|-------------|----------|-------------|--------|------------|---------------|-----------|-----------|---------------|
| Backup Generators                           | Low         |          | Low         | Medium |            | Medium        | Low       | High      | Low           |
| Bionets                                     |             |          |             |        |            |               |           |           |               |
| Bury Utility Lines, Pipes, and Tanks        |             |          |             |        |            | Medium        | Low       | High      | Low           |
| Dam Failure Evacuation Planning             | Low         |          |             |        |            |               |           |           |               |
| Debris & Natural Fuels Reduction            |             |          |             |        |            | Medium        | Low       | High      |               |
| Defensible Spaces & Buffer Zones            |             |          |             |        |            |               |           | High      |               |
| Earthquake Assessment & Retrofit            |             |          | Low         |        |            |               |           |           |               |
| Elevate Structures                          | Low         |          |             | Medium |            |               |           |           |               |
| FEMA Code 361 Safe Rooms                    |             |          |             |        |            | Medium        | Low       |           |               |
| Floodproofing                               | Low         |          |             | Medium |            |               |           |           |               |
| Insulation & Energy Efficiency              |             |          |             |        |            |               |           |           | Low           |
| Interior Furnishing Hazard Reduction        |             |          | Low         |        |            |               |           |           |               |
| Looped Grid Power Systems                   | Low         |          | Low         | Medium |            | Medium        | Low       | High      | Low           |
| Low Flow Utilities                          |             | Low      |             |        |            |               |           |           |               |
| Public Awareness & Education                | Low         | Low      | Low         | Medium |            | Medium        | Low       | High      | Low           |
| Rainwater Retention Basins                  |             | Low      |             | Medium |            |               |           |           |               |
| Raise Transportation Infrastructure         | Low         |          |             | Medium |            |               |           |           |               |
| Relocate or Buyout Vulnerable Structures    | Low         |          | Low         | Medium |            |               |           |           |               |
| SKYWARN Storm Spotter Training              |             |          |             | Medium |            | Medium        | Low       |           | Low           |
| Slope Reinforcement & Modification          |             |          |             |        |            |               |           |           |               |
| Snow Fences                                 |             |          |             |        |            |               |           |           | Low           |
| Storm Water Drainage System Upgrade         |             |          |             | Medium |            |               |           |           |               |
| Storm Water Pump Stations                   |             |          |             | Medium |            |               |           |           |               |
| Storm Siren Network Expansion               | Low         |          |             | Medium |            | Medium        | Low       | High      | Low           |
| Structural Integrity Monitoring Instruments | Low         |          |             |        |            |               |           |           |               |
| Transportation Status & Routing Systems     | Low         |          | Low         | Medium |            | Medium        | Low       | High      | Low           |
| Water Line Insulation                       |             |          |             |        |            |               |           |           | Low           |
| Wildfire Structural Retrofit                |             |          |             |        |            |               |           | High      |               |

= Hazard or Project Not Applicable to this Plan Participant  
 = Mitigation Project or Action Not Applicable to this Hazard

Table G.3 – Action & Project Prioritization, Coulee Dam

| Project/Action                              | Dam Failure | Droughts | Earthquakes | Floods | Landslides | Severe Storms | Tornadoes | Wildfires | Winter Storms |
|---|-------------|----------|-------------|--------|------------|---------------|-----------|-----------|---------------|
| Backup Generators                           | Low         |          | Low         | Low    |            | Medium        | Low       | High      | Low           |
| Bionets                                     |             |          |             |        |            |               |           |           |               |
| Bury Utility Lines, Pipes, and Tanks        |             |          |             |        |            | Medium        | Low       | High      | Low           |
| Dam Failure Evacuation Planning             | Low         |          |             |        |            |               |           |           |               |
| Debris & Natural Fuels Reduction            |             |          |             |        |            | Medium        | Low       | High      |               |
| Defensible Spaces & Buffer Zones            |             |          |             |        |            |               |           | High      |               |
| Earthquake Assessment & Retrofit            |             |          | Low         |        |            |               |           |           |               |
| Elevate Structures                          | Low         |          |             | Low    |            |               |           |           |               |
| FEMA Code 361 Safe Rooms                    |             |          |             |        |            | Medium        | Low       |           |               |
| Floodproofing                               | Low         |          |             | Low    |            |               |           |           |               |
| Insulation & Energy Efficiency              |             |          |             |        |            |               |           |           | Low           |
| Interior Furnishing Hazard Reduction        |             |          | Low         |        |            |               |           |           |               |
| Looped Grid Power Systems                   | Low         |          | Low         | Low    |            | Medium        | Low       | High      | Low           |
| Low Flow Utilities                          |             | Low      |             |        |            |               |           |           |               |
| Public Awareness & Education                | Low         | Low      | Low         | Low    |            | Medium        | Low       | High      | Low           |
| Rainwater Retention Basins                  |             | Low      |             | Low    |            |               |           |           |               |
| Raise Transportation Infrastructure         | Low         |          |             | Low    |            |               |           |           |               |
| Relocate or Buyout Vulnerable Structures    | Low         |          | Low         | Low    |            |               |           |           |               |
| SKYWARN Storm Spotter Training              |             |          |             | Low    |            | Medium        | Low       |           | Low           |
| Slope Reinforcement & Modification          |             |          |             |        |            |               |           |           |               |
| Snow Fences                                 |             |          |             |        |            |               |           |           | Low           |
| Storm Water Drainage System Upgrade         |             |          |             | Low    |            |               |           |           |               |
| Storm Water Pump Stations                   |             |          |             | Low    |            |               |           |           |               |
| Storm Siren Network Expansion               | Low         |          |             | Low    |            | Medium        | Low       | High      | Low           |
| Structural Integrity Monitoring Instruments | Low         |          |             |        |            |               |           |           |               |
| Transportation Status & Routing Systems     | Low         |          | Low         | Low    |            | Medium        | Low       | High      | Low           |
| Water Line Insulation                       |             |          |             |        |            |               |           |           | Low           |
| Wildfire Structural Retrofit                |             |          |             |        |            |               |           | High      |               |

 = Hazard or Project Not Applicable to this Plan Participant  
 = Mitigation Project or Action Not Applicable to this Hazard

Table G.4 – Action & Project Prioritization, East Wenatchee

| Project/Action                              | Dam Failure | Droughts | Earthquakes | Floods | Landslides | Severe Storms | Tornadoes | Wildfires | Winter Storms |
|---|-------------|----------|-------------|--------|------------|---------------|-----------|-----------|---------------|
| Backup Generators                           | Low         |          | Low         | Medium |            | Medium        | Low       | High      | Low           |
| Bionets                                     |             |          |             |        |            |               |           |           |               |
| Bury Utility Lines, Pipes, and Tanks        |             |          |             |        |            | Medium        | Low       | High      | Low           |
| Dam Failure Evacuation Planning             | Low         |          |             |        |            |               |           |           |               |
| Debris & Natural Fuels Reduction            |             |          |             |        |            | Medium        | Low       | High      |               |
| Defensible Spaces & Buffer Zones            |             |          |             |        |            |               |           | High      |               |
| Earthquake Assessment & Retrofit            |             |          | Low         |        |            |               |           |           |               |
| Elevate Structures                          | Low         |          |             | Medium |            |               |           |           |               |
| FEMA Code 361 Safe Rooms                    |             |          |             |        |            | Medium        | Low       |           |               |
| Floodproofing                               | Low         |          |             | Medium |            |               |           |           |               |
| Insulation & Energy Efficiency              |             |          |             |        |            |               |           |           | Low           |
| Interior Furnishing Hazard Reduction        |             |          | Low         |        |            |               |           |           |               |
| Looped Grid Power Systems                   | Low         |          | Low         | Medium |            | Medium        | Low       | High      | Low           |
| Low Flow Utilities                          |             | Low      |             |        |            |               |           |           |               |
| Public Awareness & Education                | Low         | Low      | Low         | Medium |            | Medium        | Low       | High      | Low           |
| Rainwater Retention Basins                  |             | Low      |             | Medium |            |               |           |           |               |
| Raise Transportation Infrastructure         | Low         |          |             | Medium |            |               |           |           |               |
| Relocate or Buyout Vulnerable Structures    | Low         |          | Low         | Medium |            |               |           |           |               |
| SKYWARN Storm Spotter Training              |             |          |             | Medium |            | Medium        | Low       |           | Low           |
| Slope Reinforcement & Modification          |             |          |             |        |            |               |           |           |               |
| Snow Fences                                 |             |          |             |        |            |               |           |           | Low           |
| Storm Water Drainage System Upgrade         |             |          |             | Medium |            |               |           |           |               |
| Storm Water Pump Stations                   |             |          |             | Medium |            |               |           |           |               |
| Storm Siren Network Expansion               | Low         |          |             | Medium |            | Medium        | Low       | High      | Low           |
| Structural Integrity Monitoring Instruments | Low         |          |             |        |            |               |           |           |               |
| Transportation Status & Routing Systems     | Low         |          | Low         | Medium |            | Medium        | Low       | High      | Low           |
| Water Line Insulation                       |             |          |             |        |            |               |           |           | Low           |
| Wildfire Structural Retrofit                |             |          |             |        |            |               |           | High      |               |

 = Hazard or Project Not Applicable to this Plan Participant  
 = Mitigation Project or Action Not Applicable to this Hazard

Table G.5 – Action & Project Prioritization, Mansfield

| Project/Action                              | Dam Failure | Droughts | Earthquakes | Floods | Landslides | Severe Storms | Tornadoes | Wildfires | Winter Storms |
|---|-------------|----------|-------------|--------|------------|---------------|-----------|-----------|---------------|
| Backup Generators                           |             |          | Medium      | Low    |            | Medium        | Low       | High      | Low           |
| Bionets                                     |             |          |             |        |            |               |           |           |               |
| Bury Utility Lines, Pipes, and Tanks        |             |          |             |        |            | Medium        | Low       | High      | Low           |
| Dam Failure Evacuation Planning             |             |          |             |        |            |               |           |           |               |
| Debris & Natural Fuels Reduction            |             |          |             |        |            | Medium        | Low       | High      |               |
| Defensible Spaces & Buffer Zones            |             |          |             |        |            |               |           | High      |               |
| Earthquake Assessment & Retrofit            |             |          | Medium      |        |            |               |           |           |               |
| Elevate Structures                          |             |          |             | Low    |            |               |           |           |               |
| FEMA Code 361 Safe Rooms                    |             |          |             |        |            | Medium        | Low       |           |               |
| Floodproofing                               |             |          |             | Low    |            |               |           |           |               |
| Insulation & Energy Efficiency              |             |          |             |        |            |               |           |           | Low           |
| Interior Furnishing Hazard Reduction        |             |          | Medium      |        |            |               |           |           |               |
| Looped Grid Power Systems                   |             |          | Medium      | Low    |            | Medium        | Low       | High      | Low           |
| Low Flow Utilities                          |             | Medium   |             |        |            |               |           |           |               |
| Public Awareness & Education                |             | Medium   | Medium      | Low    |            | Medium        | Low       | High      | Low           |
| Rainwater Retention Basins                  |             | Medium   |             | Low    |            |               |           |           |               |
| Raise Transportation Infrastructure         |             |          |             | Low    |            |               |           |           |               |
| Relocate or Buyout Vulnerable Structures    |             |          | Medium      | Low    |            |               |           |           |               |
| SKYWARN Storm Spotter Training              |             |          |             | Low    |            | Medium        | Low       |           | Low           |
| Slope Reinforcement & Modification          |             |          |             |        |            |               |           |           |               |
| Snow Fences                                 |             |          |             |        |            |               |           |           | Low           |
| Storm Water Drainage System Upgrade         |             |          |             | Low    |            |               |           |           |               |
| Storm Water Pump Stations                   |             |          |             | Low    |            |               |           |           |               |
| Storm Siren Network Expansion               |             |          |             | Low    |            | Medium        | Low       | High      | Low           |
| Structural Integrity Monitoring Instruments |             |          |             |        |            |               |           |           |               |
| Transportation Status & Routing Systems     |             |          | Medium      | Low    |            | Medium        | Low       | High      | Low           |
| Water Line Insulation                       |             |          |             |        |            |               |           |           | Low           |
| Wildfire Structural Retrofit                |             |          |             |        |            |               |           | High      |               |

= Hazard or Project Not Applicable to this Plan Participant  
 = Mitigation Project or Action Not Applicable to this Hazard

Table G.6 – Action & Project Prioritization, Rock Island

| Project/Action                              | Dam Failure | Droughts | Earthquakes | Floods | Landslides | Severe Storms | Tornadoes | Wildfires | Winter Storms |
|---|-------------|----------|-------------|--------|------------|---------------|-----------|-----------|---------------|
| Backup Generators                           |             |          | Low         | Low    | Low        | Medium        | Low       | High      | Low           |
| Bionets                                     |             |          |             |        | Low        |               |           |           |               |
| Bury Utility Lines, Pipes, and Tanks        |             |          |             |        | Low        | Medium        | Low       | High      | Low           |
| Dam Failure Evacuation Planning             |             |          |             |        |            |               |           |           |               |
| Debris & Natural Fuels Reduction            |             |          |             |        |            | Medium        | Low       | High      |               |
| Defensible Spaces & Buffer Zones            |             |          |             |        |            |               |           | High      |               |
| Earthquake Assessment & Retrofit            |             |          | Low         |        |            |               |           |           |               |
| Elevate Structures                          |             |          |             | Low    |            |               |           |           |               |
| FEMA Code 361 Safe Rooms                    |             |          |             |        |            | Medium        | Low       |           |               |
| Floodproofing                               |             |          |             | Low    |            |               |           |           |               |
| Insulation & Energy Efficiency              |             |          |             |        |            |               |           |           | Low           |
| Interior Furnishing Hazard Reduction        |             |          | Low         |        |            |               |           |           |               |
| Looped Grid Power Systems                   |             |          | Low         | Low    | Low        | Medium        | Low       | High      | Low           |
| Low Flow Utilities                          |             | Low      |             |        |            |               |           |           |               |
| Public Awareness & Education                |             | Low      | Low         | Low    | Low        | Medium        | Low       | High      | Low           |
| Rainwater Retention Basins                  |             | Low      |             | Low    |            |               |           |           |               |
| Raise Transportation Infrastructure         |             |          |             | Low    |            |               |           |           |               |
| Relocate or Buyout Vulnerable Structures    |             |          | Low         | Low    | Low        |               |           |           |               |
| SKYWARN Storm Spotter Training              |             |          |             | Low    |            | Medium        | Low       |           | Low           |
| Slope Reinforcement & Modification          |             |          |             |        | Low        |               |           |           |               |
| Snow Fences                                 |             |          |             |        |            |               |           |           | Low           |
| Storm Water Drainage System Upgrade         |             |          |             | Low    |            |               |           |           |               |
| Storm Water Pump Stations                   |             |          |             | Low    |            |               |           |           |               |
| Storm Siren Network Expansion               |             |          |             | Low    |            | Medium        | Low       | High      | Low           |
| Structural Integrity Monitoring Instruments |             |          |             |        |            |               |           |           |               |
| Transportation Status & Routing Systems     |             |          | Low         | Low    | Low        | Medium        | Low       | High      | Low           |
| Water Line Insulation                       |             |          |             |        |            |               |           |           | Low           |
| Wildfire Structural Retrofit                |             |          |             |        |            |               |           | High      |               |

= Hazard or Project Not Applicable to this Plan Participant  
 = Mitigation Project or Action Not Applicable to this Hazard

Table G.7 – Action & Project Prioritization, Waterville

| Project/Action                              | Dam Failure | Droughts | Earthquakes | Floods | Landslides | Severe Storms | Tornadoes | Wildfires | Winter Storms |
|---|-------------|----------|-------------|--------|------------|---------------|-----------|-----------|---------------|
| Backup Generators                           |             |          | Medium      | Low    |            | Medium        | Low       | High      | Low           |
| Bionets                                     |             |          |             |        |            |               |           |           |               |
| Bury Utility Lines, Pipes, and Tanks        |             |          |             |        |            | Medium        | Low       | High      | Low           |
| Dam Failure Evacuation Planning             |             |          |             |        |            |               |           |           |               |
| Debris & Natural Fuels Reduction            |             |          |             |        |            | Medium        | Low       | High      |               |
| Defensible Spaces & Buffer Zones            |             |          |             |        |            |               |           | High      |               |
| Earthquake Assessment & Retrofit            |             |          | Medium      |        |            |               |           |           |               |
| Elevate Structures                          |             |          |             | Low    |            |               |           |           |               |
| FEMA Code 361 Safe Rooms                    |             |          |             |        |            | Medium        | Low       |           |               |
| Floodproofing                               |             |          |             | Low    |            |               |           |           |               |
| Insulation & Energy Efficiency              |             |          |             |        |            |               |           |           | Low           |
| Interior Furnishing Hazard Reduction        |             |          | Medium      |        |            |               |           |           |               |
| Looped Grid Power Systems                   |             |          | Medium      | Low    |            | Medium        | Low       | High      | Low           |
| Low Flow Utilities                          |             | Medium   |             |        |            |               |           |           |               |
| Public Awareness & Education                |             | Medium   | Medium      | Low    |            | Medium        | Low       | High      | Low           |
| Rainwater Retention Basins                  |             | Medium   |             | Low    |            |               |           |           |               |
| Raise Transportation Infrastructure         |             |          |             | Low    |            |               |           |           |               |
| Relocate or Buyout Vulnerable Structures    |             |          | Medium      | Low    |            |               |           |           |               |
| SKYWARN Storm Spotter Training              |             |          |             | Low    |            | Medium        | Low       |           | Low           |
| Slope Reinforcement & Modification          |             |          |             |        |            |               |           |           |               |
| Snow Fences                                 |             |          |             |        |            |               |           |           | Low           |
| Storm Water Drainage System Upgrade         |             |          |             | Low    |            |               |           |           |               |
| Storm Water Pump Stations                   |             |          |             | Low    |            |               |           |           |               |
| Storm Siren Network Expansion               |             |          |             | Low    |            | Medium        | Low       | High      | Low           |
| Structural Integrity Monitoring Instruments |             |          |             |        |            |               |           |           |               |
| Transportation Status & Routing Systems     |             |          | Medium      | Low    |            | Medium        | Low       | High      | Low           |
| Water Line Insulation                       |             |          |             |        |            |               |           |           | Low           |
| Wildfire Structural Retrofit                |             |          |             |        |            |               |           | High      |               |

= Hazard or Project Not Applicable to this Plan Participant  
 = Mitigation Project or Action Not Applicable to this Hazard

Table G.8 – Action & Project Prioritization, Eastmont School District

| Project/Action                              | Dam Failure | Droughts | Earthquakes | Floods | Landslides | Severe Storms | Tornadoes | Wildfires | Winter Storms |
|---|-------------|----------|-------------|--------|------------|---------------|-----------|-----------|---------------|
| Backup Generators                           | Low         |          | Low         | Low    |            | Medium        | Low       | High      | Low           |
| Bionets                                     |             |          |             |        |            |               |           |           |               |
| Bury Utility Lines, Pipes, and Tanks        |             |          |             |        |            | Medium        | Low       | High      | Low           |
| Dam Failure Evacuation Planning             | Low         |          |             |        |            |               |           |           |               |
| Debris & Natural Fuels Reduction            |             |          |             |        |            | Medium        | Low       | High      |               |
| Defensible Spaces & Buffer Zones            |             |          |             |        |            |               |           | High      |               |
| Earthquake Assessment & Retrofit            |             |          | Low         |        |            |               |           |           |               |
| Elevate Structures                          | Low         |          |             | Low    |            |               |           |           |               |
| FEMA Code 361 Safe Rooms                    |             |          |             |        |            | Medium        | Low       |           |               |
| Floodproofing                               | Low         |          |             | Low    |            |               |           |           |               |
| Insulation & Energy Efficiency              |             |          |             |        |            |               |           |           | Low           |
| Interior Furnishing Hazard Reduction        |             |          | Low         |        |            |               |           |           |               |
| Looped Grid Power Systems                   | Low         |          | Low         | Low    |            | Medium        | Low       | High      | Low           |
| Low Flow Utilities                          |             |          |             |        |            |               |           |           |               |
| Public Awareness & Education                | Low         |          | Low         | Low    |            | Medium        | Low       | High      | Low           |
| Rainwater Retention Basins                  |             |          |             |        |            |               |           |           |               |
| Raise Transportation Infrastructure         |             |          |             |        |            |               |           |           |               |
| Relocate or Buyout Vulnerable Structures    | Low         |          | Low         | Low    |            |               |           |           |               |
| SKYWARN Storm Spotter Training              |             |          |             | Low    |            | Medium        | Low       |           | Low           |
| Slope Reinforcement & Modification          |             |          |             |        |            |               |           |           |               |
| Snow Fences                                 |             |          |             |        |            |               |           |           | Low           |
| Storm Water Drainage System Upgrade         |             |          |             |        |            |               |           |           |               |
| Storm Water Pump Stations                   |             |          |             |        |            |               |           |           |               |
| Storm Siren Network Expansion               |             |          |             |        |            |               |           |           |               |
| Structural Integrity Monitoring Instruments | Low         |          |             |        |            |               |           |           |               |
| Transportation Status & Routing Systems     |             |          |             |        |            |               |           |           |               |
| Water Line Insulation                       |             |          |             |        |            |               |           |           | Low           |
| Wildfire Structural Retrofit                |             |          |             |        |            |               |           | High      |               |

= Hazard or Project Not Applicable to this Plan Participant  
 = Mitigation Project or Action Not Applicable to this Hazard

Table G.9 – Action & Project Prioritization, Foster Creek Conservation District

| Project/Action                              | Dam Failure | Droughts | Earthquakes | Floods | Landslides | Severe Storms | Tornadoes | Wildfires | Winter Storms |
|---|-------------|----------|-------------|--------|------------|---------------|-----------|-----------|---------------|
| Backup Generators                           |             |          |             |        |            |               |           |           |               |
| Bionets                                     |             |          |             |        | Low        |               |           |           |               |
| Bury Utility Lines, Pipes, and Tanks        |             |          |             |        |            |               |           |           |               |
| Dam Failure Evacuation Planning             |             |          |             |        |            |               |           |           |               |
| Debris & Natural Fuels Reduction            |             |          |             |        |            | Medium        | Low       | High      |               |
| Defensible Spaces & Buffer Zones            |             |          |             |        |            |               |           | High      |               |
| Earthquake Assessment & Retrofit            |             |          |             |        |            |               |           |           |               |
| Elevate Structures                          |             |          |             |        |            |               |           |           |               |
| FEMA Code 361 Safe Rooms                    |             |          |             |        |            |               |           |           |               |
| Floodproofing                               |             |          |             |        |            |               |           |           |               |
| Insulation & Energy Efficiency              |             |          |             |        |            |               |           |           |               |
| Interior Furnishing Hazard Reduction        |             |          |             |        |            |               |           |           |               |
| Looped Grid Power Systems                   |             |          |             |        |            |               |           |           |               |
| Low Flow Utilities                          |             | Medium   |             |        |            |               |           |           |               |
| Public Awareness & Education                | Low         | Medium   | Low         | Medium | Low        | Medium        | Low       | High      | Low           |
| Rainwater Retention Basins                  |             | Medium   |             | Medium |            |               |           |           |               |
| Raise Transportation Infrastructure         |             |          |             |        |            |               |           |           |               |
| Relocate or Buyout Vulnerable Structures    |             |          |             |        |            |               |           |           |               |
| SKYWARN Storm Spotter Training              |             |          |             | Medium |            | Medium        | Low       |           | Low           |
| Slope Reinforcement & Modification          |             |          |             |        | Low        |               |           |           |               |
| Snow Fences                                 |             |          |             |        |            |               |           |           |               |
| Storm Water Drainage System Upgrade         |             |          |             |        |            |               |           |           |               |
| Storm Water Pump Stations                   |             |          |             |        |            |               |           |           |               |
| Storm Siren Network Expansion               |             |          |             |        |            |               |           |           |               |
| Structural Integrity Monitoring Instruments |             |          |             |        |            |               |           |           |               |
| Transportation Status & Routing Systems     |             |          |             |        |            |               |           |           |               |
| Water Line Insulation                       |             |          |             |        |            |               |           |           |               |
| Wildfire Structural Retrofit                |             |          |             |        |            |               |           |           |               |

= Hazard or Project Not Applicable to this Plan Participant  
 = Mitigation Project or Action Not Applicable to this Hazard

Table G.10 – Action & Project Prioritization, Fire Protection Districts

| Project/Action                              | Dam Failure | Droughts | Earthquakes | Floods | Landslides | Severe Storms | Tornadoes | Wildfires | Winter Storms |
|---|-------------|----------|-------------|--------|------------|---------------|-----------|-----------|---------------|
| Backup Generators                           |             |          | Low         |        |            | Medium        | Low       | High      | Low           |
| Bionets                                     |             |          |             |        |            |               |           |           |               |
| Bury Utility Lines, Pipes, and Tanks        |             |          |             |        |            |               |           |           |               |
| Dam Failure Evacuation Planning             | Low         |          |             |        |            |               |           |           |               |
| Debris & Natural Fuels Reduction            |             |          |             |        |            | Low           | Low       | High      |               |
| Defensible Spaces & Buffer Zones            |             |          |             |        |            |               |           | High      |               |
| Earthquake Assessment & Retrofit            |             |          | Low         |        |            |               |           |           |               |
| Elevate Structures                          |             |          |             |        |            |               |           |           |               |
| FEMA Code 361 Safe Rooms                    |             |          |             |        |            |               |           |           |               |
| Floodproofing                               |             |          |             |        |            |               |           |           |               |
| Insulation & Energy Efficiency              |             |          |             |        |            |               |           |           |               |
| Interior Furnishing Hazard Reduction        |             |          | Low         |        |            |               |           |           |               |
| Looped Grid Power Systems                   |             |          |             |        |            |               |           |           |               |
| Low Flow Utilities                          |             |          |             |        |            |               |           |           |               |
| Public Awareness & Education                | Low         |          | Low         | Low    |            | Medium        | Low       |           | Low           |
| Rainwater Retention Basins                  |             |          |             |        |            |               |           |           |               |
| Raise Transportation Infrastructure         |             |          |             |        |            |               |           |           |               |
| Relocate or Buyout Vulnerable Structures    |             |          |             |        |            |               |           |           |               |
| SKYWARN Storm Spotter Training              |             |          |             | Low    |            | Medium        | Low       |           | Low           |
| Slope Reinforcement & Modification          |             |          |             |        |            |               |           |           |               |
| Snow Fences                                 |             |          |             |        |            |               |           |           |               |
| Storm Water Drainage System Upgrade         |             |          |             |        |            |               |           |           |               |
| Storm Water Pump Stations                   |             |          |             |        |            |               |           |           |               |
| Storm Siren Network Expansion               |             |          |             |        |            |               |           |           |               |
| Structural Integrity Monitoring Instruments |             |          |             |        |            |               |           |           |               |
| Transportation Status & Routing Systems     |             |          |             |        |            |               |           |           |               |
| Water Line Insulation                       |             |          |             |        |            |               |           |           |               |
| Wildfire Structural Retrofit                |             |          |             |        |            |               |           | High      |               |

= Hazard or Project Not Applicable to this Plan Participant  
 = Mitigation Project or Action Not Applicable to this Hazard

Table G.11 – Action & Project Prioritization, Douglas County Public Utility District

| Project/Action                              | Dam Failure | Droughts | Earthquakes | Floods | Landslides | Severe Storms | Tornadoes | Wildfires | Winter Storms |
|---|-------------|----------|-------------|--------|------------|---------------|-----------|-----------|---------------|
| Backup Generators                           |             |          |             |        |            |               |           |           |               |
| Bionets                                     |             |          |             |        | Low        |               |           |           |               |
| Bury Utility Lines, Pipes, and Tanks        |             |          |             |        | Low        | Medium        | Low       | Medium    | Low           |
| Dam Failure Evacuation Planning             | Low         |          |             |        |            |               |           |           |               |
| Debris & Natural Fuels Reduction            |             |          |             |        |            | Medium        | Low       | High      |               |
| Defensible Spaces & Buffer Zones            |             |          |             |        |            |               |           | High      |               |
| Earthquake Assessment & Retrofit            |             |          |             |        |            |               |           |           |               |
| Elevate Structures                          |             |          |             |        |            |               |           |           |               |
| FEMA Code 361 Safe Rooms                    |             |          |             |        |            |               |           |           |               |
| Floodproofing                               |             |          |             |        |            |               |           |           |               |
| Insulation & Energy Efficiency              |             |          |             |        |            |               |           |           |               |
| Interior Furnishing Hazard Reduction        |             |          |             |        |            |               |           |           |               |
| Looped Grid Power Systems                   | Low         |          | Low         | Low    | Low        | Medium        | Low       | High      | Low           |
| Low Flow Utilities                          |             |          |             |        |            |               |           |           |               |
| Public Awareness & Education                | Low         |          | Low         | Low    | Low        | Medium        | Low       | High      | Low           |
| Rainwater Retention Basins                  |             |          |             |        |            |               |           |           |               |
| Raise Transportation Infrastructure         |             |          |             |        |            |               |           |           |               |
| Relocate or Buyout Vulnerable Structures    |             |          |             |        |            |               |           |           |               |
| SKYWARN Storm Spotter Training              |             |          |             | Low    |            | Medium        | Low       |           | Low           |
| Slope Reinforcement & Modification          |             |          |             |        | Low        |               |           |           |               |
| Snow Fences                                 |             |          |             |        |            |               |           |           | Low           |
| Storm Water Drainage System Upgrade         |             |          |             |        |            |               |           |           |               |
| Storm Water Pump Stations                   |             |          |             |        |            |               |           |           |               |
| Storm Siren Network Expansion               |             |          |             |        |            |               |           |           |               |
| Structural Integrity Monitoring Instruments |             |          |             |        |            |               |           |           |               |
| Transportation Status & Routing Systems     |             |          |             |        |            |               |           |           |               |
| Water Line Insulation                       |             |          |             |        |            |               |           |           |               |
| Wildfire Structural Retrofit                |             |          |             |        |            |               |           |           |               |

= Hazard or Project Not Applicable to this Plan Participant  
 = Mitigation Project or Action Not Applicable to this Hazard

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# Appendix H – Plan Adoption Resolutions

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BOARD OF COUNTY COMMISSIONERS  
DOUGLAS COUNTY, WASHINGTON

A Resolution Adopting the Amendments to the  
Douglas County Hazard Mitigation Plan.

)  
) **Resolution**  
) **CE No. 20-31**  
)  
) Current Expense

**WHEREAS**, The participating jurisdictions of Douglas County have worked together to develop a strategy known as the Douglas County Hazard Mitigation Plan to improve disaster resistance in the planning area; AND

**WHEREAS**, the Federal Disaster Mitigation Act of 2000 (DMA2000) pursuant 44 CFR Part 201 and the Federal Emergency Management Agency (FEMA) require communities to adopt an approved hazard mitigation plan in order to be eligible to receive pre-disaster and post disaster federal funding for mitigation purposes; AND

**WHEREAS**, the participating jurisdiction has participated in the hazard mitigation plan by the formation of a Mitigation Planning Committee (MPC); AND

**WHEREAS**, the MPC recommends the formal adoption of the Douglas County HMP by the passing of this resolution.

**NOW THEREFORE**, be it resolved by the Douglas County Board of County Commissioners that:

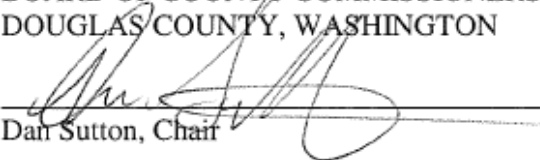
**Section 1:** The participating stakeholder hereby approves and adopts the hazard mitigation plan in its entirety with projects as adopted by the MPC; AND agree to be governed by the HMP attached hereto and incorporated.

**Section 2:** The participating stakeholder authorizes the appropriate participating officials to pursue funding opportunities for implementation of proposals designated therein; AND will upon receipt of such funding or other necessary resources, seek to implement the actions contained in the plan.

**Section 3:** The participating jurisdiction will continue to cooperate and participate in the hazard mitigation planning process, holding regular meetings, including reporting of progress as required by FEMA, the State of Washington and Emergency Management Division and the MPC.

Adopted this 28th day of April, 2020, in the Douglas County Public Services Building, 140 NW 19<sup>th</sup> St., East Wenatchee, Washington.

BOARD OF COUNTY COMMISSIONERS  
DOUGLAS COUNTY, WASHINGTON

  
\_\_\_\_\_  
Dan Sutton, Chair



  
\_\_\_\_\_  
Marc S. Straub, Vice-Chair

  
\_\_\_\_\_  
Kyle Steinburg, Commissioner

ATTEST:

  
\_\_\_\_\_  
Tiana Rowland, Clerk of the Board

Approved as to form:

  
\_\_\_\_\_  
Jim Mitchell, Civil Deputy Prosecuting Attorney  
WSBA #31031

**RESOLUTION 20-09**

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BRIDGEPORT, WASHINGTON, ADOPTING DOUGLAS COUNTY HAZARD MITIGATION PLAN (HMP).**

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**WHEREAS**, the participating jurisdictions of Douglas County have worked together to develop a strategy known as the Douglas County HMP to improve disaster resistance in the planning area; and

**WHEREAS**, the Federal Disaster Mitigation Act of 2000 (DMA2000) pursuant 44 CFR Part 201 and the Federal Emergency Management Agency (FEMA) require communities to adopt an approved hazard mitigation plan in order to be eligible to receive pre-disaster and post disaster federal funding for mitigation purposes; and

**WHEREAS**, the participating jurisdiction has participated in the hazard mitigation plan by the formation of a Mitigation Planning Committee (MPC); and

**WHEREAS**, the MPC recommends the formal adoption of the Douglas County HMP by the passing of this resolution.

**NOW THEREFORE**, THE CITY COUNCIL OF THE CITY OF BRIDGEPORT< WASHINGTON, HEREBY RESOLVE AS FOLLOWS:

**Section 1.** The participating stakeholder hereby approves and adopts the hazard mitigation plan in its entirety with projects as adopted by the MPC; AND agree to be governed by the HMP attached hereto and incorporated.

**Section 2.** The participating stakeholder authorizes the appropriate participating officials to pursue funding opportunities for implementation of proposals designated therein; AND will upon receipt of such funding or other necessary resources, seek to implement the actions contained in the plan.

**Section 3.** The participating jurisdiction will continue to cooperate and participate in the hazard mitigation planning process, holding regular meetings, including reporting of progress as required by FEMA, the State of Washington and Emergency Management Division and the MPC.

**Section 4.** This Resolution shall be effective immediately upon passage by the City Council.

**RESOLVED** this 18<sup>th</sup> day of November, 2020.

**APPROVED:**

  
\_\_\_\_\_  
JANET CONKLIN, MAYOR

**ATTEST/AUTHENTICATED:**

  
\_\_\_\_\_  
JUDY BROWN, CITY CLERK/TREASURE

## City of East Wenatchee, Washington

### Resolution No. 2020-13

A Resolution of the City of East Wenatchee, Washington adopting the 2019 Douglas County Multi-Jurisdictional Hazard Mitigation Plan, repealing Resolution 2003-06, and providing an effective date.

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#### 1. Alternate format.

- 1.1. Para leer este documento en otro formato (español, Braille, leer en voz alta, etc.), póngase en contacto con el vendedor de la ciudad al [alternateformat@east-wenatchee.com](mailto:alternateformat@east-wenatchee.com), al (509) 884-9515 o al 711 (TTY).
- 1.2. To read this document in an alternate format (Spanish, Braille, read aloud, etc.), please contact the City Clerk at [alternateformat@east-wenatchee.com](mailto:alternateformat@east-wenatchee.com), at (509) 884-9515, or at 711 (TTY).

#### 2. Authority.

- 2.1. RCW 35A.11.020 and RCW 35A.12.190 authorize the City Council to organize and regulate its internal affairs and to define the powers, functions and duties of its officers and employees.

#### 3. Recitals.

- 3.1. The participating jurisdictions of Douglas County have worked together to develop a strategy known as the Douglas County Multi-Jurisdictional Hazard Mitigation Plan (HMP) to improve disaster resistance in the planning area.
- 3.2. The Federal Disaster Mitigation Act of 2000, pursuant 44 CFR Part 201, and the Federal Emergency Management Agency (FEMA) require communities to adopt an approved hazard mitigation plan in order to be eligible to receive pre-disaster and post disaster federal funding for mitigation purposes.
- 3.3. The City of East Wenatchee is vulnerable to the human and economic costs of natural, technological and societal disasters.

City of East Wenatchee Resolution 2020-13

Page 1 of 3

Retain Resolution until no longer needed for City-business, then transfer to Washington State Archives (GS50-05A-16 Rev. 1)

- 3.4. The City Council recognizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community.

THE CITY COUNCIL OF THE CITY OF EAST WENATCHEE DO RESOLVE AS FOLLOWS:

- 4. Adoption.** The City Council adopts the 2019 Douglas County Multi-Jurisdictional Hazard Mitigation Plan (HMP) as forth in Exhibit A.
- 5. Repeal.** The City Council repeals Resolution 2003-06.
- 6. Funding.** The City Council authorizes the appropriate City officials and employees to pursue funding opportunities to implement the proposals designated in the HMP. If the City receives funding, the City will seek to implement the actions contained in the HMP.
- 7. Ongoing Participation.** The City will cooperate and participate in the hazard mitigation planning process, attend regular meetings, and report progress as required by the Federal Emergency Management Agency, by the State of Washington Emergency Management Division, and by the HMP.
- 8. Severability.** If a court of competent jurisdiction declares any provision in this resolution to be contrary to law, the other provisions of this Resolution remain valid.
- 9. Effective date.** This Resolution becomes effective immediately upon passage by the City Council.

Passed by the City Council of East Wenatchee, at a regular meeting thereof on this 5<sup>th</sup> day of May, 2020.

The City of East Wenatchee,  
Washington

By Jerrilea Crawford  
Jerrilea A. Crawford, Mayor

Attest:

Maria E. Holman  
Maria Holman, City Clerk

Approved as to form only:

Devin Poulson  
Devin Poulson, City Attorney

Filed with the City Clerk: 4.29.2020  
Passed by the City Council: 5.5.2020  
Effective Date: 5.5.2020



**RESOLUTION NO. 2020-03**

**A RESOLUTION ADOPTING THE FINALIZED  
DOUGLAS COUNTY HAZARD MITIGATION PLAN (HMP)**

**WHEREAS**, the participating jurisdictions of Douglas County have worked together to develop a strategy known as the Douglas County Hazard Mitigation Plan (HMP) to improve disaster resistance in the planning area; AND

**WHEREAS**, the Federal Disaster Mitigation Act of 2000 (DMA2000) pursuant 44 CFR Part 201 and the Federal Emergency Management Agency (FEMA) require communities to adopt an approved hazard mitigation plan in order to be eligible to receive pre-disaster and post disaster federal funding for mitigation purposes; AND

**WHEREAS**, the participating jurisdiction has participated in the hazard mitigation plan by the formation of a Mitigation Planning Committee (MPC); AND

**WHEREAS**, the MPC recommends the formal adoption of the Douglas County HMP by the passing of this resolution.

**NOW, THEREFORE, BE IT RESOLVED BY THE EASTMONT SCHOOL BOARD THAT:**

**Section 1:** The participating stakeholder hereby approves and adopts the hazard mitigation plan in its entirety with projects as adopted by the MPC; AND agree to be governed by the HMP attached hereto and incorporated.

**Section 2:** The participating stakeholder authorizes the appropriate participating officials to pursue funding opportunities for implementation of proposals designated therein; AND will upon receipt of such funding or other necessary resources, seek to implement the actions contained in the plan.

**Section 3:** The participating jurisdiction will continue to cooperate and participate in the hazard mitigation planning process, holding regular meetings, including reporting of progress as required by FEMA, the State of Washington, and Emergency Management Division and the MPC.

**ADOPTED** by the Board of Directors of Eastmont School District No. 206, Douglas County, Washington, at a regular meeting thereof, held on April 13, 2020, with the following Directors being present and voting thereon.

**ATTEST:**

  
\_\_\_\_\_  
Garn Christensen, Secretary to the Board

4/13/20  
Date

**BOARD OF DIRECTORS**

  
\_\_\_\_\_  
Dave Piepel, Board President

  
\_\_\_\_\_  
Annette Eggers, Board Vice President

  
\_\_\_\_\_  
Meaghan Vibbert, Board Member

  
\_\_\_\_\_  
Whitney Smith, Board Member

  
\_\_\_\_\_  
Cindy Wright, Board Member

**FOSTER CREEK CONSERVATION DISTRICT  
RESOLUTION NO. 2020-02**

Foster Creek Conservation District Board meeting : **May 13, 2020.**

Resolution of the Board of Supervisors for the finalized Douglas County Hazard Mitigation Plan (HMP); Providing and effective date; and for other purposes:

**WHEREAS**, The participating jurisdictions of Douglas County have worked together to develop a strategy known as the Douglas County HMP to improve disaster resistance in the planning area; AND

**WHEREAS**, the Federal Disaster Mitigation Act of 2000 (DMA2000) pursuant 44 CFR Part 201 and the Federal Emergency Management Agency (FEMA) require communities to adopt an approved hazard mitigation plan in order to be eligible to receive pre-disaster and post disaster federal funding for mitigation purposes; AND

**WHEREAS**, the participating jurisdiction has participated in the hazard mitigation plan by the formation of a Mitigation Planning Committee (MPC); AND

**WHEREAS**, the MPC recommends the formal adoption of the Douglas County HMP by the passing of this resolution.

Therefore, be it resolved by the Foster Creek Conservation District Board of Supervisors that:

**Section 1:** The participating stakeholder hereby approves and adopts the hazard mitigation plan in its entirety with projects as adopted by the MPC; AND agree to be governed by the HMP attached hereto and incorporated.

**Section 2:** The participating stakeholder authorizes the appropriate participating officials to pursue funding opportunities for implementation of proposals designated therein; AND will upon receipt of such funding or other necessary resources, seek to implement the actions contained in the plan.

**Section 3:** The participating jurisdiction will continue to cooperate and participate in the hazard mitigation planning process, holding regular meetings, including reporting of progress as required by FEMA, the State of Washington and Emergency Management Division and the MPC.

The resolution was offered for adoption by : **John McLean**

The motion to adopt was seconded by : **Douglas Poole**

Motion successfully voted on by the Foster Creek Conservation District Board of Supervisors:

**John McLean, Board Chair**

**Lee Hemmer, Board Vice-chair**

**Douglas Poole, Board Auditor**

**Wade Troutman, Supervisor**

**Kelsey Tanneberg, Supervisor.**

**Dated : May 13, 2020**

*(by Zoom virtual meeting, due to Covid-19 shut-down)*

# Appendix I – FEMA Approval Letter

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U.S. Department of Homeland Security  
FEMA Region 10  
130 228th Street, SW  
Bothell, WA 98021-8627



## FEMA

March 26, 2021

The Honorable Dan Sutton  
Board of Douglas County Commissioners  
203 South Rainier Street  
P.O. Box 747  
Waterville, Washington 98858-0747

Dear Chair Sutton:

On July 14, 2020, the United States Department of Homeland Security’s Federal Emergency Management Agency (FEMA) Region 10, approved the Douglas County Natural Hazards 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 through July 13, 2025, through your state.

|                                    |                        |                          |
|------------------------------------|------------------------|--------------------------|
| Douglas County                     | City of East Wenatchee | Eastmont School District |
| Foster Creek Conservation District | City of Mansfield      | City of Bridgeport       |

The updated list of approved jurisdictions includes the City of Bridgeport that recently adopted the City of Bridgeport Addendum to the Douglas County Natural Hazards Mitigation Plan. 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, Kevin Zerbe, State Mitigation Strategist with Washington Emergency Management Division, at (253) 512-7467, who coordinates and administers these efforts for local entities.

Sincerely,

JOHN A GRAVES Digitally signed by JOHN A GRAVES Date: 2021.03.30 05:56:43 -07'00' for

Kristen Meyers, Director  
Mitigation Division

cc: Tim Cook, Washington Emergency Management Division

Enclosure

JM:vl

[www.fema.gov](http://www.fema.gov)