

CHAPTER 6. CITY OF GRANITE FALLS ANNEX

6.1 HAZARD MITIGATION PLAN POINT OF CONTACT

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6.2 JURISDICTION PROFILE

The following is a summary of key information about the jurisdiction and its history:

- **Date of Incorporation**—1903
- **Current Population**—3,375 as of April 1, 2009.
- **Annual Population Growth Rate**—The City of Granite Falls population growth rate has averaged 5.96 percent per year since 1990.
- **Location and Description**—Granite Falls is located in the center of Snohomish County, between the South Fork of the Stillaguamish River and the Pilchuck River, at the base of Mount Pilchuck. It lies 17 miles northeast of Everett and I-5. State Route 92 meets the main thoroughfare in town and passes on to the Mountain Loop Highway, which is Snohomish County’s only access to the North Cascade Loop. Granite Falls is 360 feet above sea level.
- **Brief History**—Granite Falls is the site of former Native American fishing grounds. It later became a railroad station on the route between Monte Cristo (now a ghost town) and Everett. Granite Falls was incorporated in 1903, when lumber was the predominant industry. The town’s first timber mill was open by 1891 and a dozen mills were operating by 1906. Now, Granite Falls is largely a residential community whose occupants commute to other parts of Snohomish and King Counties.
- **Climate**—Granite Falls enjoys a temperate four-season climate with an average low temperature of 42°F and an average high temperature of 60°F. The average annual rain fall is 44.3 inches. The average annual snowfall accumulation is 16.7 inches.
- **Governing Body Format**—A mayor governs the City of Granite Falls, along with a city council made up of five elected members. The city council will assume responsibility for adoption of this plan. The mayor oversees department heads (city clerk, treasurer, police chief, and public works director) who conduct the day to day operations of the city.

The City of Granite Falls maintains its own police department with eight full time officers, twelve reserve officers, one code enforcement officer, one records officer and two citizen patrol officers. It also maintains a public works department, wastewater treatment plant, planning commission and zoning officials. The fire department is maintained by Snohomish County, with a full time chief, firefighters, and a volunteer staff of firefighters.

- **Development Trends**—Based on the data tracked by the Washington Office of Financial Management, Granite Falls has experienced a relatively high rate of growth with a 43.8 percent population increase since 2000. There are currently 1,257 housing units within the City averaging 2.68 persons per household. This represents a 44 percent increase in the number of households within the City since 2000. Projections estimate Granite Fall’s population will increase to 4770 by 2025.

Washington State law (RCW 36.70) requires all cities in counties that meet population criteria to adopt a comprehensive plan to guide community development. The plan must present goals, policies and implementation measures, and city actions relating to land use, annexations, zoning, subdivision, design review, redevelopment and capital improvements must be consistent with the plan. The City of Granite Falls adopted its most recent general plan in 2005, in compliance with RCW 36.70. Future development will be managed as identified in the plan. The City will review the plan annually and amend it as necessary.

6.3 JURISDICTION-SPECIFIC NATURAL HAZARD EVENT HISTORY

Table 6-1 lists all significant past occurrences of natural hazards within the jurisdiction. The City has no FEMA-identified repetitive flood loss properties.

6.4 HAZARD RISK RANKING

Table 6-2 presents the ranking of the hazards of concern.

6.5 CAPABILITY ASSESSMENT

The assessment of the jurisdiction’s legal and regulatory capabilities is presented in Table 6-3. The assessment of the jurisdiction’s administrative and technical capabilities is presented in Table 6-4. The assessment of the jurisdiction’s fiscal capabilities is presented in Table 6-5. Classifications under various community mitigation programs are presented in Table 6-6.

6.6 HAZARD MITIGATION ACTION PLAN AND EVALUATION OF RECOMMENDED INITIATIVES

Table 6-7 lists the initiatives that make up the jurisdiction’s hazard mitigation plan. Table 6-8 identifies the priority for each initiative. Table 6-9 summarizes the mitigation initiatives by hazard of concern and the six mitigation types.

6.7 STATUS OF PREVIOUS PLAN INITIATIVES

Table 6-10 summarizes the initiatives that were recommended in the previous version of the hazard mitigation plan and their implementation status at the time this update was prepared.

6.8 FUTURE NEEDS TO BETTER UNDERSTAND RISK

Identify areas of infrastructure degradation within the city’s water, sewer and stormwater systems as well as buildings to more specifically identify areas of risk/vulnerability within the city.

6.9 HAZARD AREA EXTENT AND LOCATION

Hazard area extent and location maps have been generated for the City of Granite Falls and are included at the end of this chapter. These maps are based on the best available data at the time of the preparation of this plan, and are considered to be adequate for planning purposes.

TABLE 6-1. NATURAL HAZARD EVENTS			
Type of Event	FEMA Disaster #(if applicable)	Date	Preliminary Damage Assessment
Severe Winter Storm, Record and Near Record Snow	1825-DR	3/2009	N/A
Wind Storm	N/A	3/2003	\$250,000
Earthquake (Nisqually)	1361-DR	2/2001	No information available - minor damage
Earthquake (Duvall)	N/A	5/1996	Damage to private businesses
Flood	1100-DR	2/1996	No significant damage
Flood	1079-DR	12/1995	No significant damage

TABLE 6-2. HAZARD RISK RANKING		
Rank	Hazard Type	Risk Rating Score (Probability x Impact)
1	Severe Weather	42
2	Earthquake	36
3	Wild Fire	36
4	Flood	18 ^b
5	Landslide	18
6	Avalanche	0 ^a
7	Dam Failure	0 ^a
8	Volcano/Lahar	0 ^a
9	Tsunami	0 ^a

a. No exposure = Risk rating score of 0
 b. While the City has no riverine flood exposure, it does have flood exposure from urban drainage or stormwater runoff. Therefore risk ranking has been assigned subjectively

**TABLE 6-3.
LEGAL AND REGULATORY CAPABILITY**

	Local Authority	State or Federal Prohibitions	Other Jurisdictional Authority	State Mandated	Comments
Codes, Ordinances & Requirements					
Building Code	Y	N	N	Y	Title 15, Chapter 15.02 (adopted 2007 Ord. #747). IBC (adopted 7/01/04)
Zonings	Y	N	N	Y	Title 19 (2007 by Ord. #740-07)
Subdivisions	Y	N	N	Y	Title 19 (adopted 2007 by Ord. #740-07)
Stormwater Management	Y	N	N	Y	Granite Falls has adopted the WA. Dept. Of Ecology 2005 Stormwater Management Manual for Western Washington
Post Disaster Recovery	N	N	N	N	
Real Estate Disclosure	N	N	N	N	
Growth Management	Y	N	N	Y	GMA compliant Comprehensive Plan 2005-2025; adopted in 2005 and amended annually through 2009.
Site Plan Review	Y	N	N	N	Title 19: Adopted 2007
Special Purpose (flood management, critical areas)	Y	Y	N	Y	Floodplain Regulations: Chapter 19.07 Critical Areas Regulations. Chapter 19.07 (Adopted April 2010, Ord. #799-10)- <i>State law prohibits residential construction in designated floodway.</i>
Planning Documents					
General or Comprehensive Plan	Y	N	N	Y	GMA compliant Comprehensive Plan 2005-2025; adopted in 2005 and amended annually through 2009.
Floodplain or Basin Plan	N	N	N	N	
Stormwater Plan	N	N	N	N	
Capital Improvement Plan	Y	N	N	N	Included in Comprehensive Plan
Habitat Conservation Plan	N	N	N	N	The City does have critical areas regulations that's purpose is to protect critical habitat as mandated by State GMA.
Economic Development Plan	Y	N	N	Y	This is an element of the Comp plan.
Emergency Response Plan	Y	N	N	N	Currently has one
Shoreline Management Plan	Y	N	N	Y	Title 19 Section 19.7.030, adopted in 2007
Post Disaster Recovery Plan	N	N	N	N	

**TABLE 6-4.
ADMINISTRATIVE AND TECHNICAL CAPABILITY**

Staff/Personnel Resources	Available?	Department/Agency/Position
Planners or engineers with knowledge of land development and land management practices	Y	None on staff. However these are contract positions
Engineers or professionals trained in building or infrastructure construction practices	Y	None on staff. However these are contract positions
Planners or engineers with an understanding of natural hazards	Y	None on staff. However these are contract positions
Staff with training in benefit/cost analysis	Y	None on staff. However these are contract positions
Floodplain manager	Y	None on staff. However these are contract positions
Surveyors	Y	None on staff. However these are contract positions
Personnel skilled or trained in GIS applications	Y	None on staff. However there is "on-call" contract availability
Scientist familiar with natural hazards in local area	Y	Snohomish County DEM provides this service
Emergency manager	Y	No designated person is assigned this task; however individuals in each department are capable of applying for grants.
Grant writers	N	No on staff personnel have been trained in FEMA's Cost/Benefit analysis protocol. There is also expertise in this field at the County level available to assist in this process.

**TABLE 6-5.
FISCAL CAPABILITY**

Financial Resources	Accessible or Eligible to Use?
Community Development Block Grants	Yes
Capital Improvements Project Funding	Yes, Public Works Trust Fund or city funding
Authority to Levy Taxes for Specific Purposes	Yes-
User Fees for Water, Sewer, Gas or Electric Service	Yes – water, sewer, and stormwater fees, taxes collected on gas and electric service
Incur Debt through General Obligation Bonds	Yes. School, Transportation
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activity Bonds	Yes
Withhold Public Expenditures in Hazard-Prone Areas	Yes, but not likely
State Sponsored Grant Programs	No
Development Impact Fees for Homebuyers or Developers	Yes.
Other	Public Works Trust Fund, Real Estate Excise Tax.

	Participating?	Classification	Date Classified
Community Rating System	No	NA	NA
Building Code Effectiveness Grading Schedule	Yes	3/3	5/1/2010
Public Protection	Yes	5	5/1/2010
Storm Ready	No	NA	NA
Firewise	No	NA	NA

Applies to new or existing assets	Hazards Mitigated	Objectives Met	Lead Agency	Estimated Cost	Sources of Funding	Timeline	Included in Previous Plan?
Initiative #GF-1 —Determine structural vulnerability of older structures on NEHRP D and E soils and seismic retrofit.							
Existing	Earthquake	2, 4, 11, 14	City of Granite Falls: Public Works Manager	High	FEMA Mitigation Grant funding, Property Owner Contribution	Long-term, depends on funding	Yes
Initiative #GF-2 —Replace or retrofit vulnerable critical utility infrastructure.							
Existing	Earthquake, flood, landslide, severe weather, wildfire	1, 2, 5, 14	City of Granite Falls: Public Works Manager	High	CIP funding, FEMA Mitigation Grant Funding	Long-term, depends on funding	Yes
Initiative #GF-3 —Educate the public on vegetation management practices to reduce risk to homes.							
New and Existing	Severe Weather, Landslide, Wildfire	1, 2, 9, 10, 11	City of Granite Falls: Public Works Manager	Low	General Fund	Short-term	Yes
Initiative #GF-4 —Maintain and clear storm drains and culverts							
New and existing	Flood, Severe Weather	1, 2, 9, 10, 11	City of Granite Falls: Public Works Manager	Low	Stormwater Fund	Short-term, ongoing	Yes

TABLE 6-7 (continued). HAZARD MITIGATION ACTION PLAN MATRIX							
Applies to new or existing assets	Hazards Mitigated	Objectives Met	Lead Agency	Estimated Cost	Sources of Funding	Timeline	Included in Previous Plan?
Initiative #GF-5 —Promote open space uses in identified high hazard areas by use of setbacks, greenways and environmentally sensitive areas							
New and existing	All Hazards	1, 2, 3, 7, 13	City of Granite Falls: Public Works Manager	Low	General Fund	Short-term, ongoing	Yes
Initiative #GF-6 —Promote non-structural seismic retrofitting for residential structures on NEHRP D and E soils							
Existing	Earthquake	1, 2, 9, 10, 11	City of Granite Falls: Public Works Manager	High	FEMA Hazard Mitigation Grant programs, Property owner contribution for local match	Long-term, depends on funding	Yes
Initiative #GF-7 —Educate the public on fire prevention and policy by: a) Restricting hazardous activities during high risk times and b) Encouraging residents to store water on-site and clear defensible space along structures c) Manage fuel loads through Controlled burns or harvesting							
New and Existing	Wildfire	1, 2, 9, 10, 11	Department of Public Works, City Engineer	Low	General Fund, possible grant funding (post-disaster PA funding)	Short-term	Yes
Initiative #GF-8 —Consider participation in the “Firewise” program							
New and Existing	Wildfire	1, 2, 9, 10, 11	Department of Public Works, City Engineer	Low	General Fund	Long-term	No
Initiative #GF-9 —Support County-wide initiatives identified in Chapter 21 of Volume 1.							
New and Existing	All Hazards	All	City of Granite Falls	Low	General fund	Short-term, ongoing	No
Initiative #GF-10 —Continue to maintain compliance and good standing under the National Flood Insurance Program (NFIP).							
New and existing	Flood	1, 2, 9, 10, 11	City of Granite Falls: Public Works Manager	Low	General Fund	Short-term, ongoing	No

**TABLE 6-7 (continued).
HAZARD MITIGATION ACTION PLAN MATRIX**

Applies to new or existing assets	Hazards Mitigated	Objectives Met	Lead Agency	Estimated Cost	Sources of Funding	Timeline	Included in Previous Plan?
Initiative #GF-11 —Where appropriate, support retrofitting, purchase, or relocation of structures located in hazard-prone areas to protect structures from future damage, with repetitive loss and severe repetitive loss properties as priority when applicable.							
Existing	All Hazards	6,7,11,14	City of Granite Falls: Public Works Manager	High	FEMA Hazard Mitigation Grant funding with local match provided by property owner contribution	Long-term depends on funding	No
Initiative #GF-12 —Continue to support the implementation, monitoring, maintenance, and updating of this Plan, as defined in Chapter 7 of Volume 1.							
New and Existing	All Hazards	All	City of Granite Falls	Low	General Fund, FEMA Mitigation Grant Funding for 5-year update	Short-term, ongoing	No
Initiative #GF-13 —Integrate where appropriate, risk assessment information from the Snohomish County Hazard Mitigation Plan into other planning mechanisms available to the City such as; the Capital Improvements program, the Comprehensive planning process, and Shorelines Master planning.							
New and Existing	All Hazards	All	City of Granite Falls, Planning Department	Low	General Fund	Short-term ongoing	No

**TABLE 6-8.
MITIGATION STRATEGY PRIORITY SCHEDULE**

Initiative #	#of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Costs?	Is Project Grant-Eligible?	Can Project Be Funded Under Existing Programs/ Budgets?	Priority ^a
GF-1	4	High	High	Yes	Yes	No	Medium
GF-2	4	High	High	Yes	Yes	No	Medium
GF-3	5	Low	Low	Yes	No	Yes	High
GF-4	5	Medium	Low	Yes	No	Yes	High
GF-5	5	High	Low	Yes	Yes	Yes	High
GF-6	5	High	High	Yes	Yes	No	Medium
GF-7	5	Low	Low	Yes	Yes	Yes	High
GF-8	5	High	Low	Yes	No	Yes	Medium
GF-9	14	Medium	Low	Yes	No	Yes	High
GF-10	5	Medium	Low	Yes	No	Yes	High
GF-11	4	High	High	Yes	Yes	No	Medium
GF-12	14	Medium	Low	Yes	Yes	Yes	High
GF-13	14	High	Low	Yes	No	Yes	High

a. Explanation of priorities

- High Priority: Project meets multiple plan objectives, benefits exceed cost, funding is secured under existing programs, or is grant eligible, and project can be completed in 1 to 5 years (i.e., short term project) once funded.
- Medium Priority: Project meets at least 1 plan objective, benefits exceed costs, requires special funding authorization under existing programs, grant eligibility is questionable, and project can be completed in 1 to 5 years once funded.
- Low Priority: Project will mitigate the risk of a hazard, benefits exceed costs, funding has not been secured, project is not grant eligible, and time line for completion is long term (5 to 10 years).

**TABLE 6-9.
ANALYSIS OF MITIGATION INITIATIVES**

Hazard Type	Initiative Addressing Hazard, by Mitigation Type					
	1. Prevention	2. Property Protection	3. Public Education and Awareness	4. Natural Resource Protection	5. Emergency Services	6. Structural Projects
Avalanche						
Dam Failure						
Earthquake	5, 9, 12, 13	1, 2, 6, 9, 11	9, 12	5, 9	2, 9	9
Flood	4, 5, 9, 10, 12, 13	2, 9, 10, 11	9, 10, 12	5, 9, 10	2, 9, 10	4, 9, 10
Landslide	5, 9, 12, 13	2, 9, 11	3, 9, 12	5, 9	2, 9	9
Severe Weather	4, 5, 9, 12, 13	2, 9, 11	3, 9, 12	5, 9	2, 9	4, 9
Tsunami						
Volcano/ Lahar						
Wildfire	5, 8, 9, 12, 13	2, 8, 9, 11	3, 7, 8, 9, 12	5, 8, 9	2, 8, 9	9

Notes:

1. Prevention: Government, administrative or regulatory actions that influence the way land and buildings are developed to reduce hazard losses. Includes planning and zoning, floodplain laws, capital improvement programs, open space preservation, and stormwater management regulations.
2. Property Protection: Modification of buildings or structures to protect them from a hazard or removal of structures from a hazard area. Includes acquisition, elevation, relocation, structural retrofit, storm shutters, and shatter-resistant glass.
3. Public Education and Awareness: Actions to inform citizens and elected officials about hazards and ways to mitigate them. Includes outreach projects, real estate disclosure, hazard information centers, and school-age and adult education.
4. Natural Resource Protection: Actions that minimize hazard loss and preserve or restore the functions of natural systems. Includes sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
5. Emergency Services: Actions that protect people and property during and immediately after a hazard event. Includes warning systems, emergency response services, and the protection of essential facilities.
6. Structural Projects: Actions that involve the construction of structures to reduce the impact of a hazard. Includes dams, setback levees, floodwalls, retaining walls, and safe rooms.













**TABLE 6-10.
PREVIOUS ACTION PLAN IMPLEMENTATION STATUS**

Action #	Action Status			Comments
	Completed	Carry Over to Plan Update	Removed; No Longer Feasible	
GF-1		X		No action completed on this initiative during initial performance period. Act has been carried over to updated action plan (GF-1)
GF-2		X		No action completed on this initiative during initial performance period. Act has been carried over to updated action plan (GF-2)
GF-3		X		No action completed on this initiative during initial performance period. Act has been carried over to updated action plan (GF-3)
GF-4		X		Ongoing action. Has been carried over to updated action plan (GF-4)
GF-5		X		Ongoing action. Has been carried over to updated action plan (GF-5)
GF-6		X		No action completed on this initiative during initial performance period. Act has been carried over to updated action plan (GF-6)
GF-7		X		No action completed on this initiative during initial performance period. Act has been carried over to updated action plan (GF-7)

CITY OF GRANITE FALLS

Map 6-1

Critical Facilities

-  Bridge
-  Communication
-  Dam
-  Government
-  Hazmat
-  Medical
-  Power
-  Protective
-  School
-  Wastewater
-  Water
-  Other



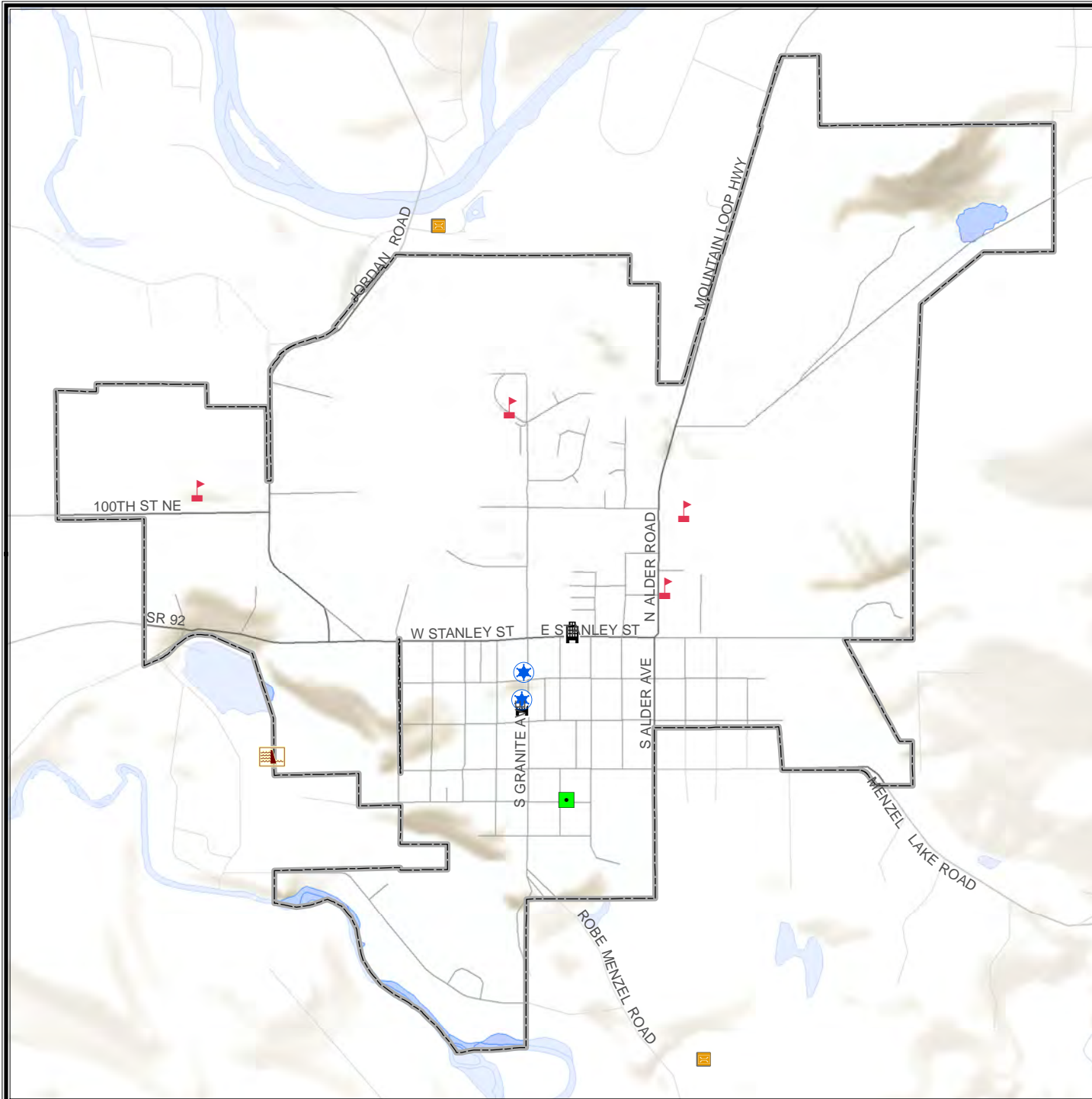
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May 2010

Data Sources:
Snohomish County
Project Planning Partners
Washington State Department of
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CITY OF GRANITE FALLS

Map 6-2

Earthquake Peak Ground Acceleration 100-year Probabilistic Scenario

Mercalli Scale, Potential Damage

- IV, None
- V, Very Light
- VI, Light
- VII, Moderate
- VIII, Moderate-Heavy
- IX, Heavy



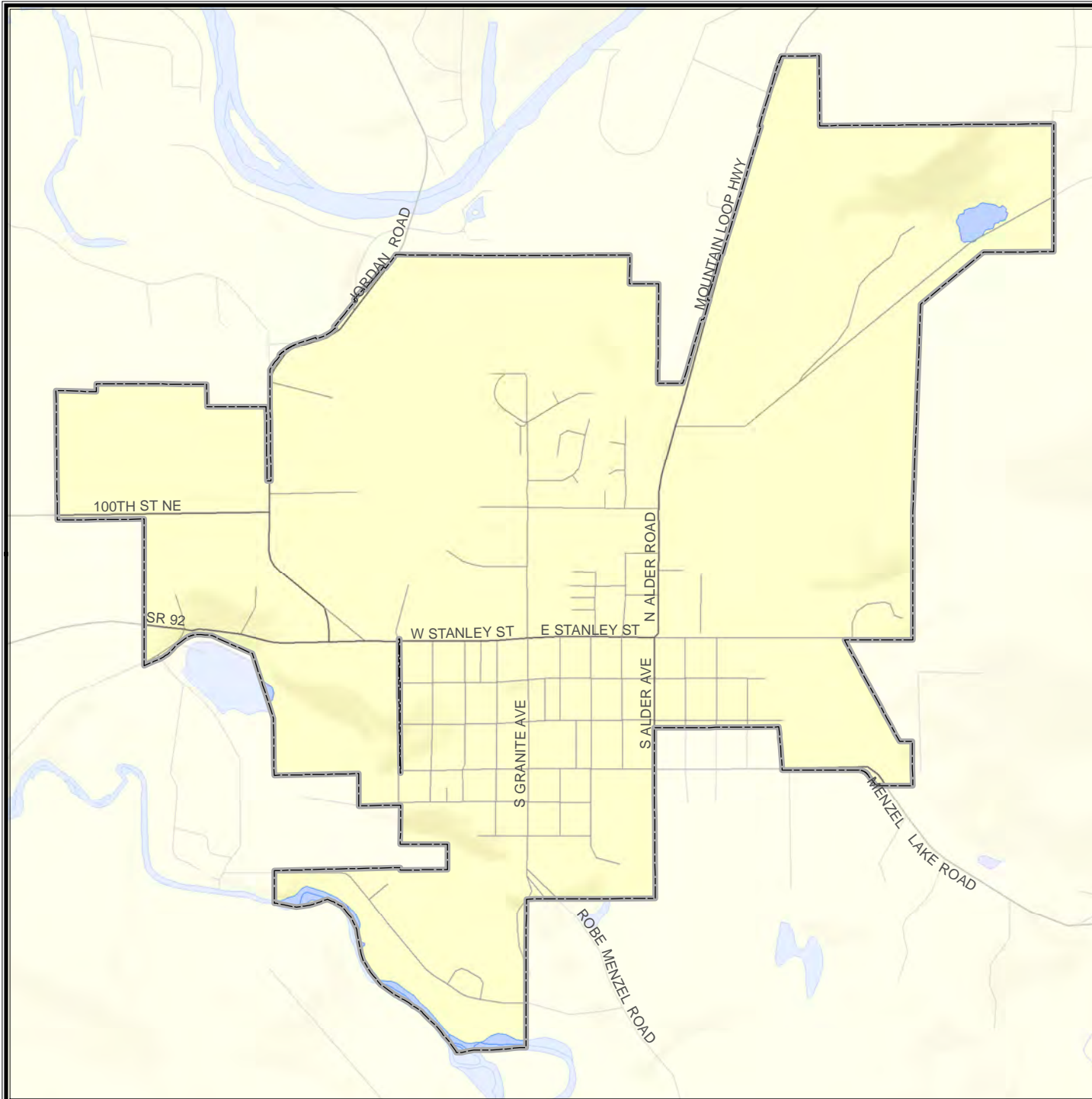
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Data Sources:
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HAZUS-MH MR4 Output,
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CITY OF GRANITE FALLS

Map 6-3

Earthquake Peak Ground Acceleration 500-year Probabilistic Scenario

Mercalli Scale, Potential Damage

- IV, None
- V, Very Light
- VI, Light
- VII, Moderate
- VIII, Moderate-Heavy
- IX, Heavy



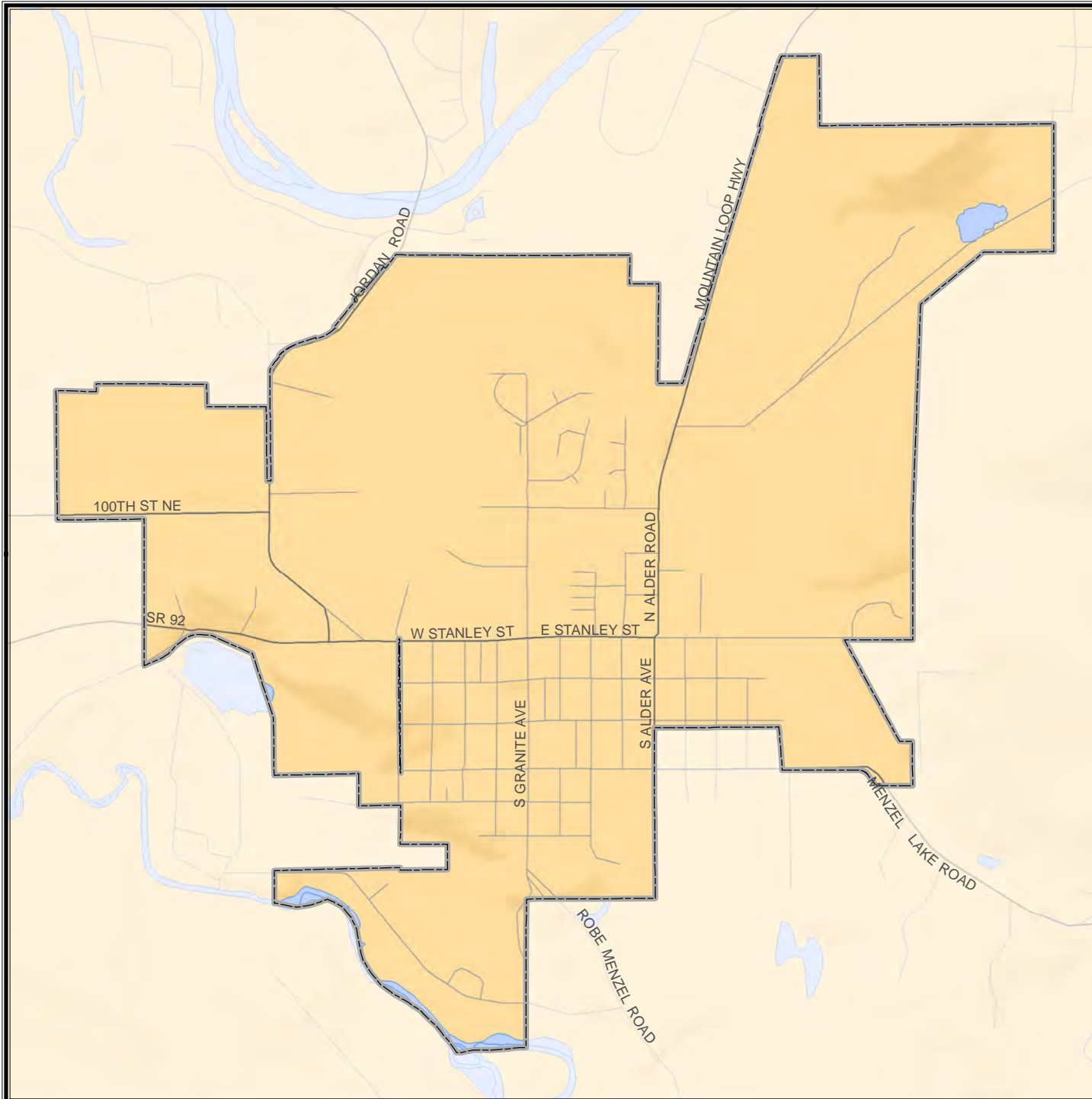
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CITY OF GRANITE FALLS

Map 6-4

Devil's Mountain Fault Peak Ground Acceleration 7.1-Magnitude Scenario Shake Map

Mercalli Scale, Potential Damage

- IV, None
- V, Very Light
- VI, Light
- VII, Moderate
- VIII, Moderate-Heavy
- IX, Heavy



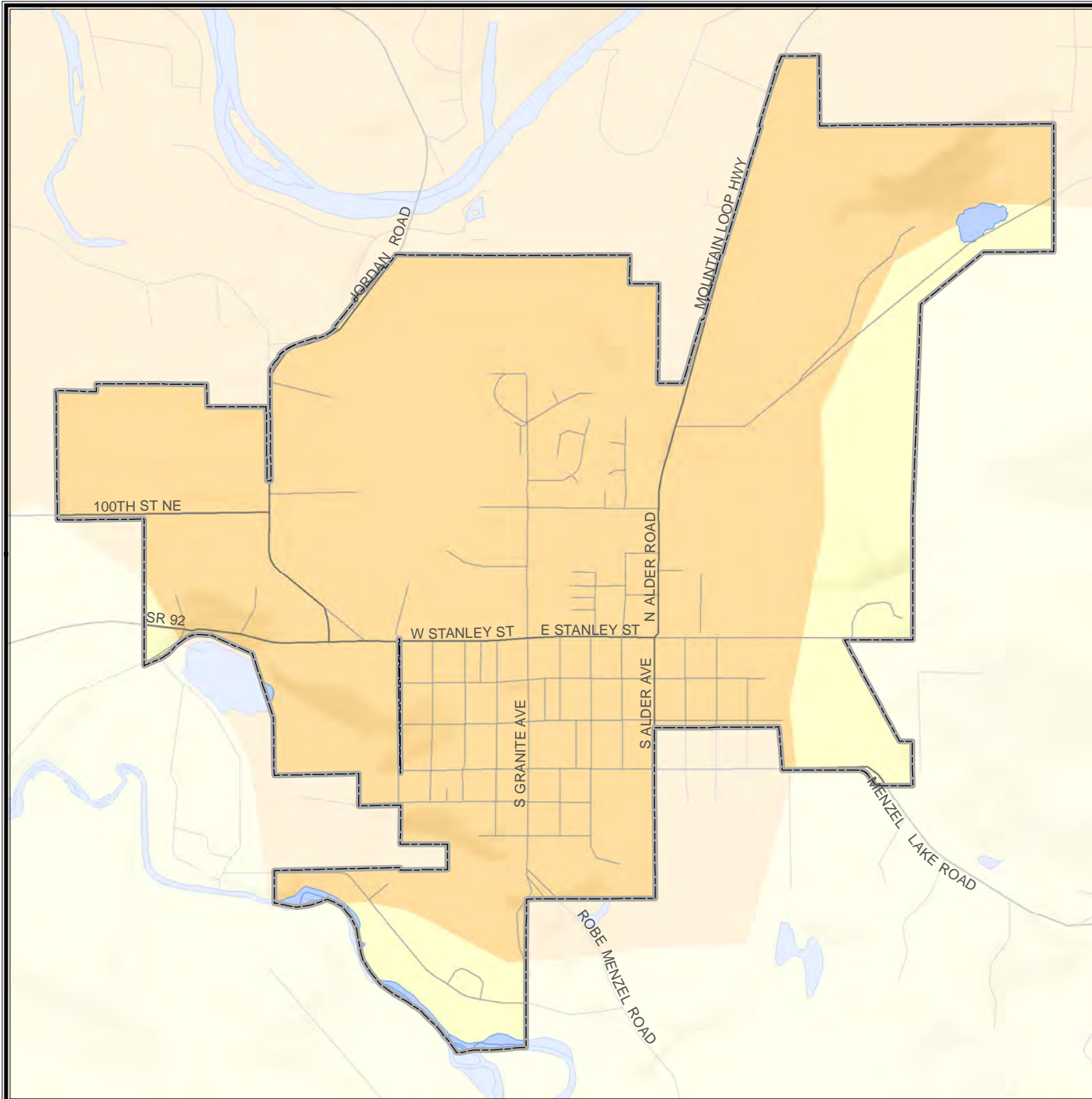
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CITY OF GRANITE FALLS

Map 6-5

South Whidbey Fault
Peak Ground Acceleration
7.4-Magnitude Scenario
Shake Map

Mercalli Scale, Potential Damage

- IV, None
- V, Very Light
- VI, Light
- VII, Moderate
- VIII, Moderate-Heavy
- IX, Heavy



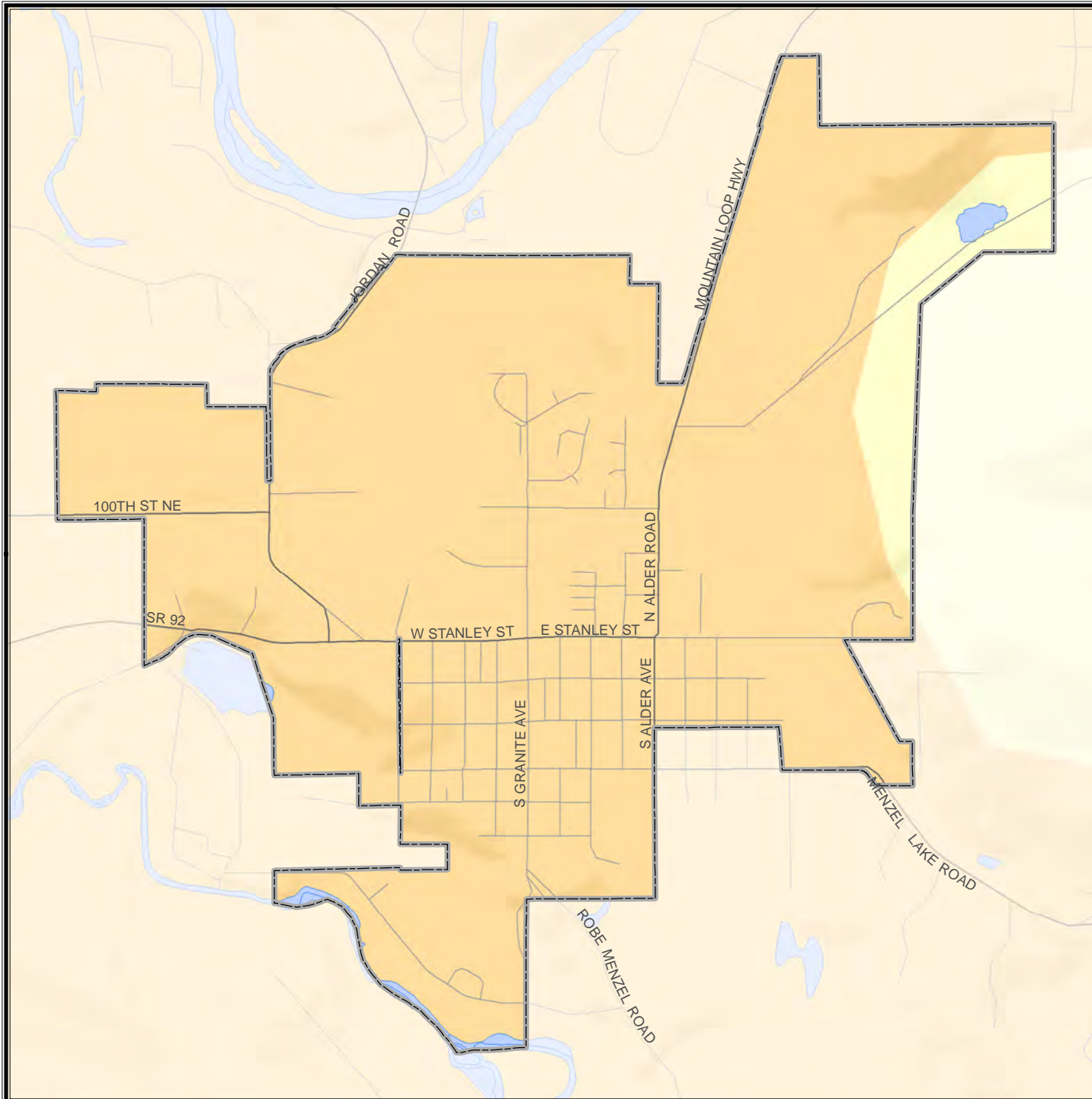
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CITY OF GRANITE FALLS

Map 6-6

National Earthquake Hazard Reduction Program (NEHRP)

Soil Site Classes

-  Site Class F - Requires site-specific investigation
-  Site Class E - Soft Soil
-  Site Class D - Stiff Soil
-  Site Class C - Very Dense Soil and Soft Rock
-  Site Class B - Rock
-  Water
-  Ice



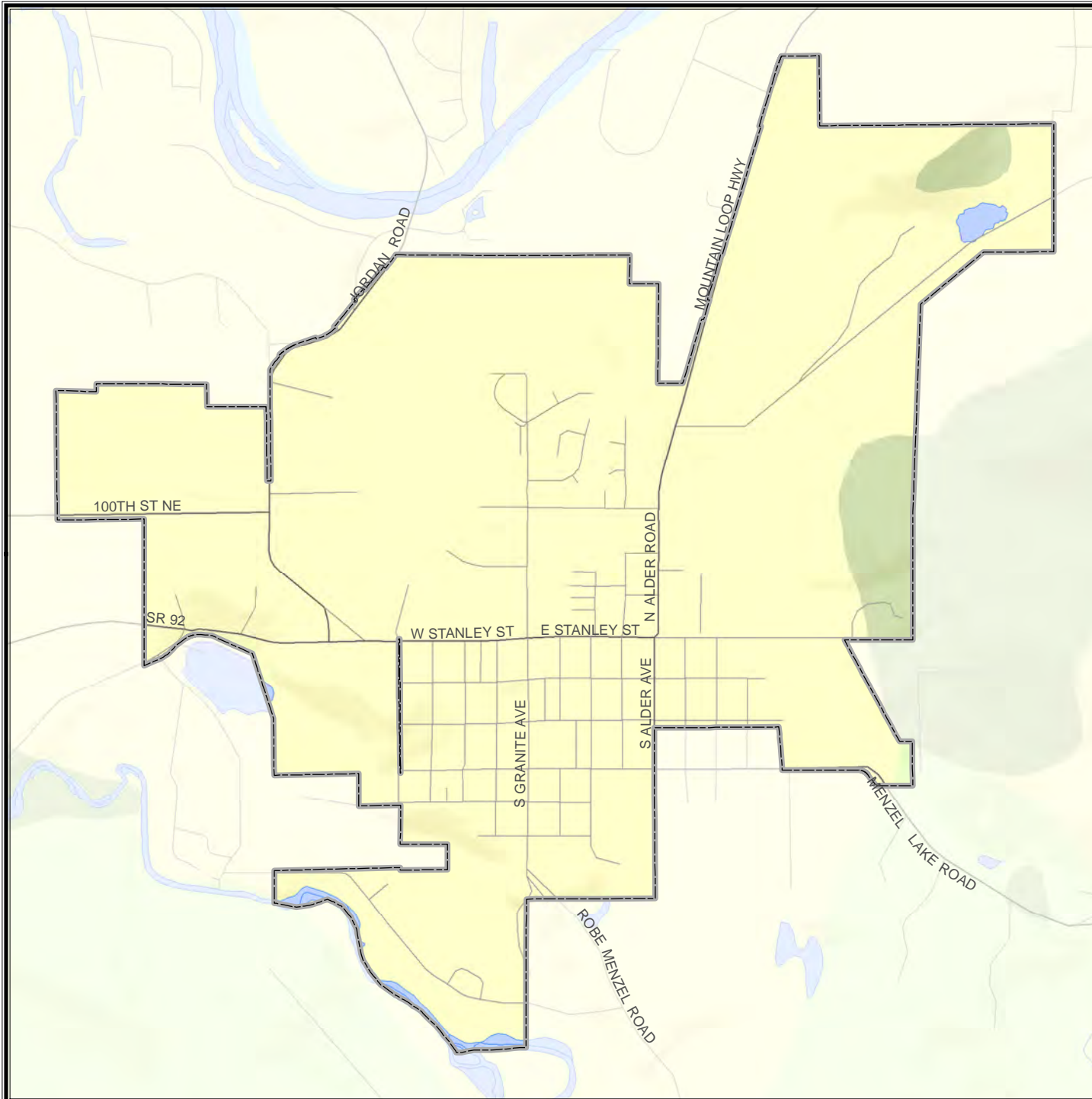
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CITY OF GRANITE FALLS

Map 6-7

Liquefaction Susceptibility

Liquefaction Susceptibility

-  High
-  Moderate to High
-  Moderate
-  Low to Moderate
-  Low
-  Very Low to Low
-  Very Low

Not Susceptible to Liquefaction

-  Bedrock
-  Peat
-  Water
-  Ice



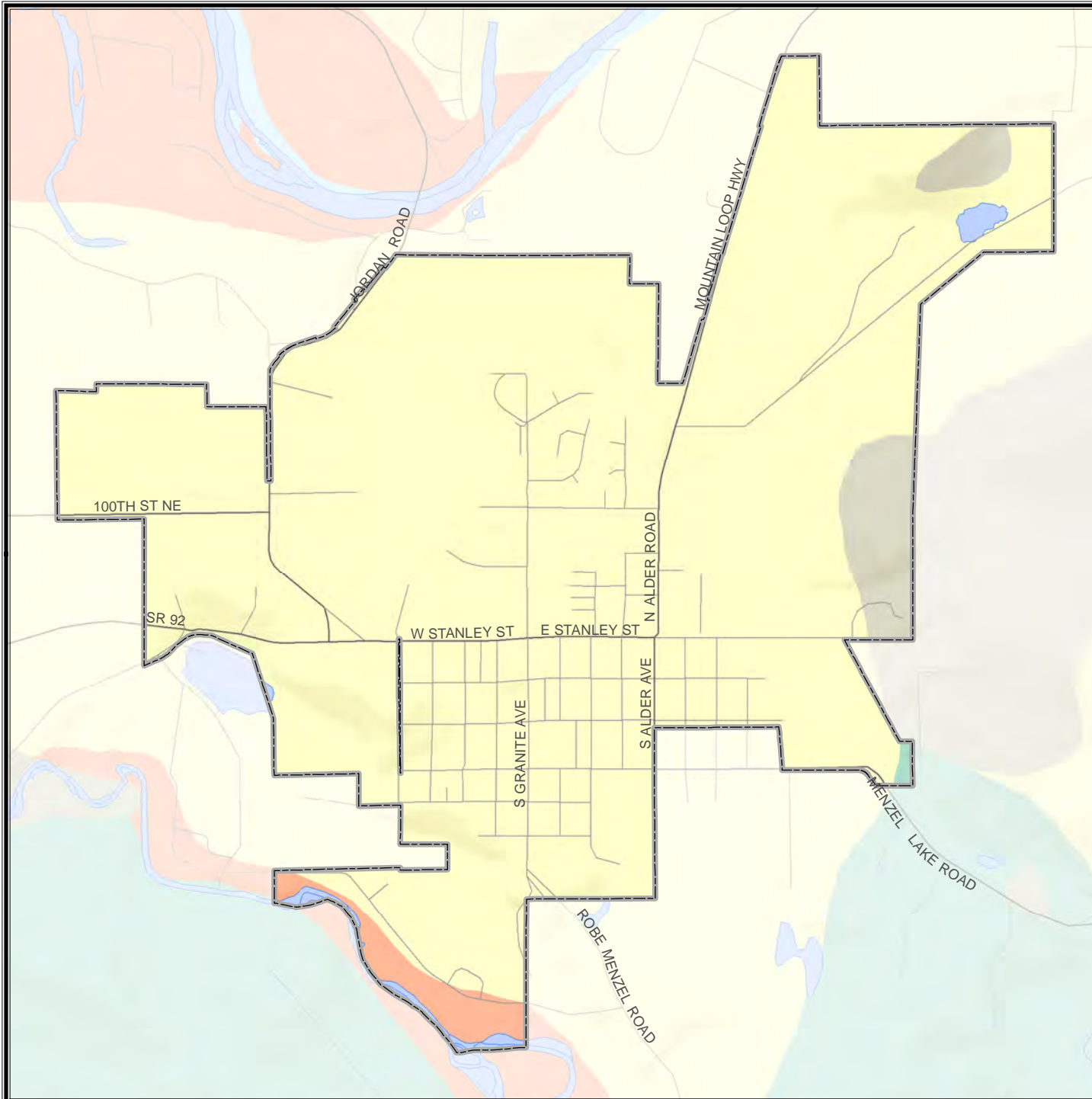
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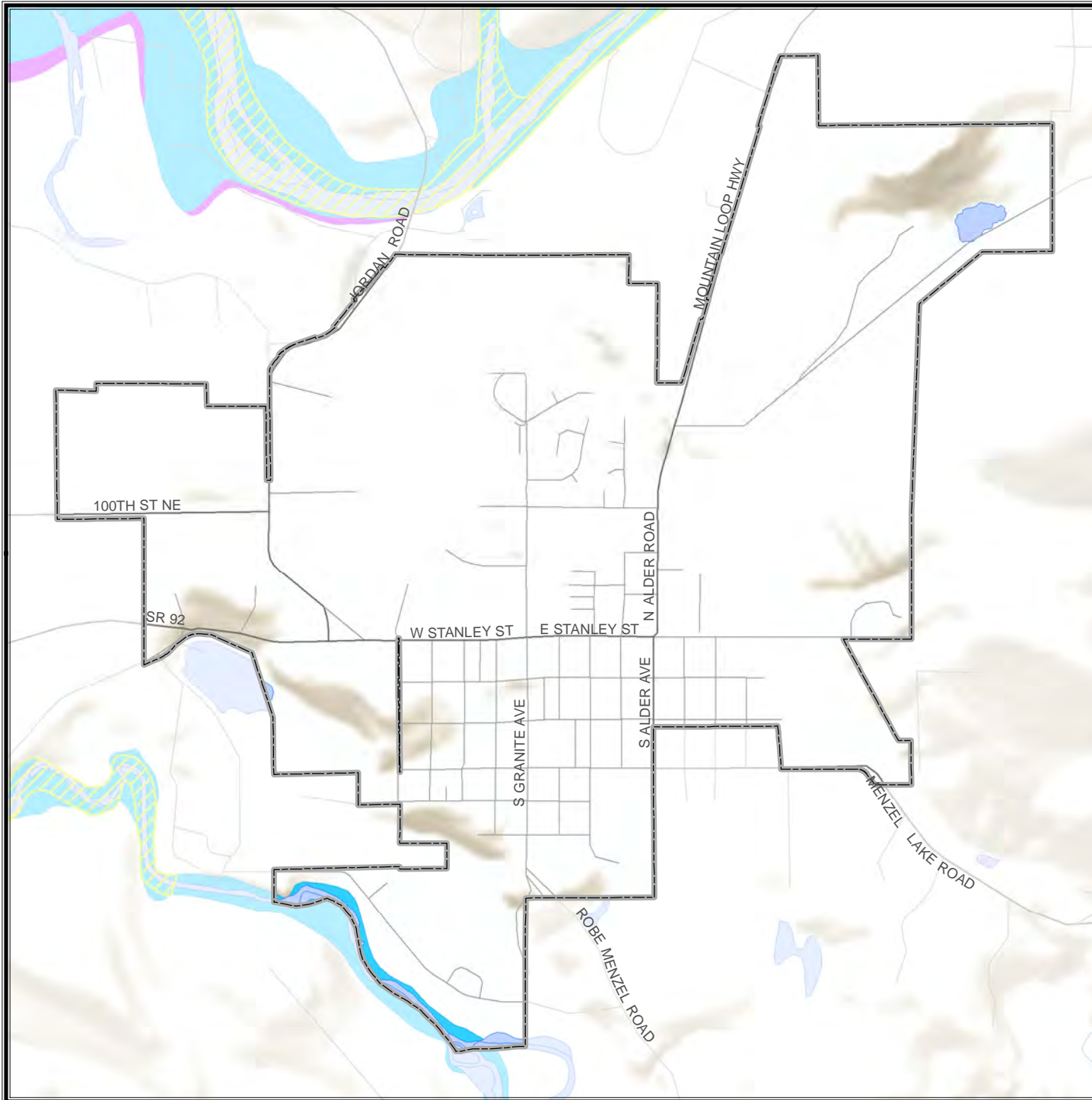
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US Geological Survey
Washington State Department of
Natural Resources, Division of Geology
and Earth Resources



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CITY OF GRANITE FALLS

Map 6-8

Flood Hazard Areas

-  Special Flood Hazard Area (100 Year)
-  Special Flood Hazard Area (500 Year)
-  Special Flood Hazard Area (Floodway)



Snohomish County

Tetra Tech, Inc.
May 2010

Data Sources:
Snohomish County
FEMA Digital Flood Insurance Rate Maps
Washington State Department of
Natural Resources, Division of Geology
and Earth Resources




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CITY OF GRANITE FALLS

Map 6-9

Landslide Hazard Areas

-  **Landslide Potential Areas**
Slope Greater than 33% and elevation change greater than or equal to 10 feet, intersecting soft and stiff soils.



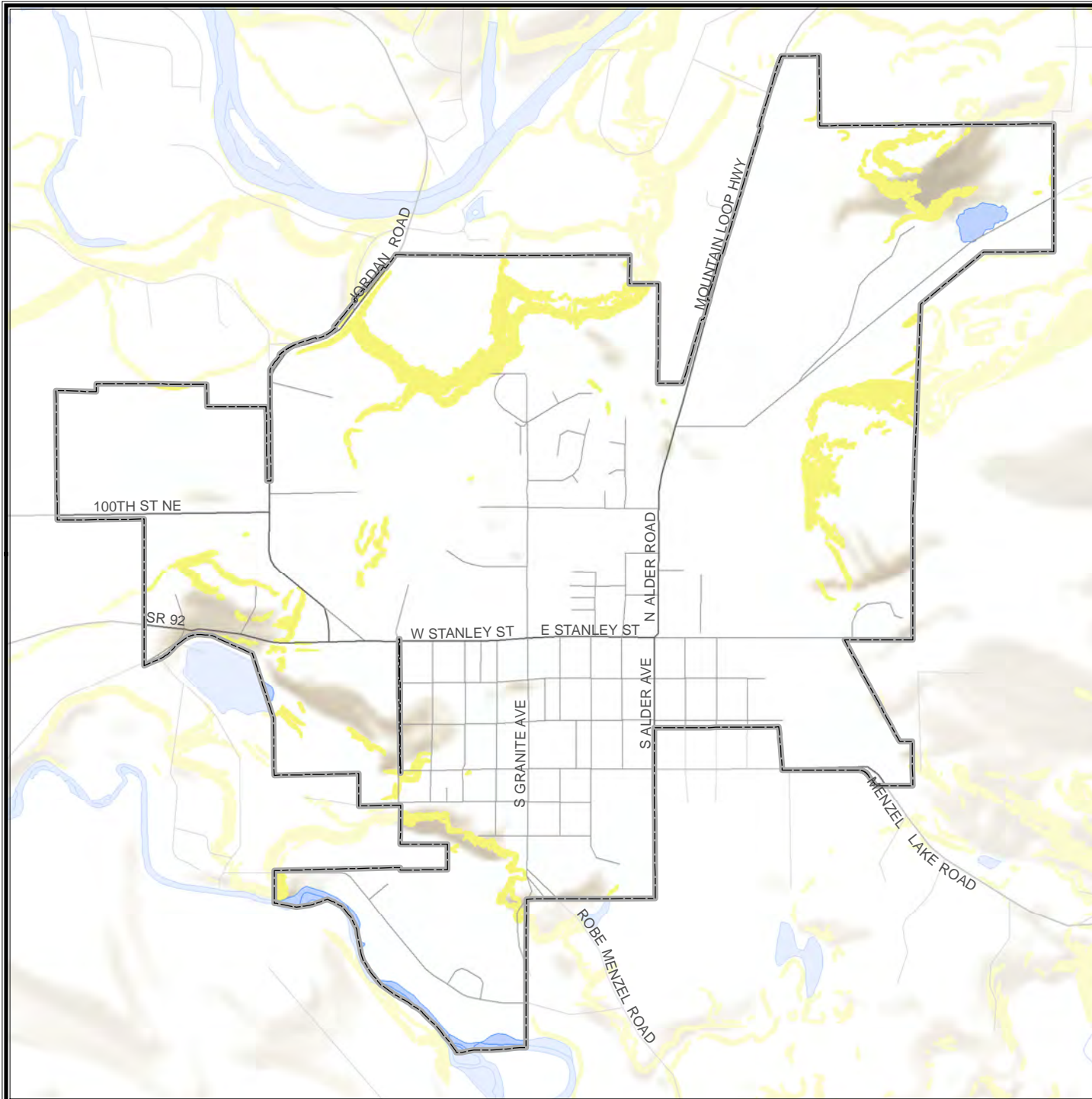
Snohomish County

Tetra Tech, Inc.
May 2010

Data Sources:
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CITY OF GRANITE FALLS

Map 6-10

Wildland Urban Interface (WUI) High Risk Communities

 DNR Wildfire Hazard -
Wildland Urban Interface (WUI)
High Risk Communities

 DNR Wildfire Hazard -
Areas updated by Snohomish
County Fire District Planning
Partners to better represent
Wildfire Risk in Snohomish
County



Snohomish County

Tetra Tech, Inc.
May 2010

Data Sources:

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