The Grant County All-Hazards Mitigation Plan

2006

Grant County Department of Emergency Management

Introduction ... 3
Plan Adoption ... 6
Plan Development Process ... 8
Plan Maintenance ... 12
EXECUTIVE SUMMARY ... 18
Summary of Comprehensive Plans ... 21
How to Use This Plan ... 27
ACKNOWLEDGEMENTS ... 28
Hazard Profiles ... 34
Hazard Rating Process ... 35
Profile of Grant County ... 38
Civil Disturbance ... 46
Drought ... 50
Earthquake ... 55
Fire ... 59
Flood ... 64
Hazardous Materials ... 68
Land Movement ... 72
Radiological ... 75
Severe Storms ... 78
Special Hazards ... 83
Transportation ... 85
Utilities ... 91
Volcanic Activity ... 96
Mitigation Goals and Initiatives ... 106
Grant County ... 112
Quincy-George Region ... 135
Southwest Region ... 169
Ephrata-Soap Lake Region ... 199
Moses Lake-Warden Region ... 233
Northeast Region ... 260
APPENDIX A: Population Analysis ... 303
APPENDIX B: Resolutions Adopting the Plan ... 305
APPENDIX C: Maps ... 306
APPENDIX D: Record of Changes ... 307

Introduction

Throughout history, the residents of Grant County have dealt with the various hazards affecting the area. Photographs, journal entries, and newspapers from the mid to late 1800's to the present show that the residents of the area have dealt with the affects from flooding, severe windstorms, winter storms, and some volcanic activity. Although there were fewer people in the area many years ago, the hazards did at times, adversely affect the lives of those who depended on the land and climate conditions for food and welfare. As the population of the county increased, the exposure to hazards created a greater risk than experienced historically. With an ever-continuing growth in population and the development of natural lands, the impact of these hazards will continue to escalate.

Grant County's rural setting combined with its mild climate, and proximity to the Columbia River and other large recreational lakes, create an ideal locale that continues to draw people to the area. The area is extensively interconnected by a web of waterways, coulees, canals, lakes, and the Columbia River.

Flooding has been reduced by the controlled release of water that is closely monitored by the Federal Bureau of Reclamation, the Grant County Public Utility District (PUD), and the various irrigation districts that regulate water flow through the region.

The PUD operates two dams on the Columbia River, Wanapum and Priest Rapids. The Federal Bureau of Reclamation operates five dams within or bordering the county; Grand Coulee, North Dam, Dry Falls Dam, Pinto Ridge Dam, and O'Sullivan Dam. The Moses Lake Irrigation District operates and manages two outlet dams on Moses Lake.

Of all the natural hazards, Grant County is most vulnerable to drought, severe storms, windstorms, and lightning and to a lesser extent, landslides, floods, wildfire, urban fire, hail, and volcanic activity. Grant County is more vulnerable to technological hazards as a result of a natural event than by the technological hazard events themselves.

Technological hazards, or human-caused hazards may include utility shortages or failure, hazardous material spills or releases, transportation accidents and local or 'special hazards' unique to a particular community such as grain elevator accidents.

It is impossible to predict exactly when or even which of these disasters will occur, or the extent to which they will affect the county, but one or more of these hazards will happen. Because the county is most vulnerable to weather related hazards, virtually every square mile can be affected. However, with careful planning and collaboration among public agencies, private sector organizations, as well as citizens and businesses within the community, it is possible to minimize the losses that may result from these disasters.

What is hazard mitigation?
Hazard mitigation is the development and implementation of activities designed to reduce or eliminate losses resulting from hazards.

Why develop a hazards mitigation strategy?
Developing a mitigation strategy for Grant County completes the process of planning that began with the Grant County Comprehensive Emergency Management Plan (CEMP.) This plan serves to establish a foundation for coordination and collaboration among local agencies, jurisdictions, and the citizens of Grant County in addition to identifying mitigation strategies and future mitigation projects.

The rising cost of responding to and recovering from disasters has led to identifying effective ways to reduce the vulnerability to hazards. Hazard mitigation plans assist communities in identifying the hazards that could impact them, determine the vulnerability of the community, and identify mitigation strategies to prevent or reduce impacts to the community through a coordinated, multi-jurisdictional approach.

What are the benefits of hazard mitigation?

- **Save lives and property** – communities can save lives and reduce property damage from hazards through mitigation actions, such as moving families and their homes out of harm's way or by limiting development and/or regulating the type of construction or structures allowed in hazard areas.

- **Reduce vulnerability to future hazards** – by having a mitigation strategy in place, communities are better prepared to take the proper steps that will reduce the risk of future losses.

- **Improve recovery operations** – by developing a mitigation strategy, communities can identify disaster mitigation opportunities in advance of a disaster.

- **Demonstrate a commitment to improving community health and safety** – developing a mitigation strategy demonstrates a community's commitment to safeguarding its citizens and protecting its economic and environmental well-being.

Who does the hazards mitigation plan benefit?

The Grant County All- Hazards Mitigation Plan was developed, written, and adopted as a multi-jurisdictional, hazard mitigation plan for the benefit of the incorporated municipalities, various special purpose districts as well as the unincorporated rural areas of Grant County. It is anticipated that a large number of county special purpose districts will also adopt this plan in order to benefit from future hazard mitigation planning. The information contained in this plan serves to provide the framework for hazard mitigation

within Grant County, applicable county-wide. Much has already been gained in developing this plan and establishing the basic mitigation strategies that have been incorporated into this document. It is hoped that the spirit of inter-jurisdictional cooperation will continue in the years to come.

Land use policy in Washington

Mitigation planning for hazards in Washington has taken shape over the past 30 years beginning with the State Environmental Policy Act (1971) and the Shorelines Management Act (1971), and followed by the State Building Code Act (1974, 1985) and the Growth Management Act (1991). It is an integral element of Washington's statewide land use planning program which focuses on appropriate land use controls in critical areas that are prone to disasters, along with keeping up with the latest technology in construction methods to mitigate potential disasters.

Support for hazard mitigation

The primary responsibility for the development and implementation of mitigation strategies and policies lies within each jurisdiction. However, local jurisdictions are not alone; various partners and resources exist at the local, state and federal levels to assist in the development of mitigation strategies and plans. Within Grant County, Grant County Emergency Management is the lead coordinating agency for hazard mitigation planning assistance to local jurisdictions. This planning effort created a task force for developing a county-wide hazard mitigation plan.

Plan Adoption

Members of Grant County Emergency Management invited all jurisdictions and special purpose districts to participate in the planning and development of the Grant County All-Hazards Mitigation Plan. The table below identifies the participating entities. Following the plan's completion, the participating entity's governing body formally adopted the plan.

Summary of Adopting Resolutions

Agency/Jurisdiction	Approving Entity	Resolution Number
Grant County	Board of Commissioners	06-178-CC
Grant County Hospital District #5	Hospital Board	2006-0026
Grant County Hospital District #6	Hospital Board	501
Town of Coulee City	Town Council	316
Town of Electric City	Town Council	7-2006
City of Ephrata	City Council	06-876
City of Grand Coulee	City Council	06-06
Town of George	Town Council	2006-203
Town of Hartline	Town Council	2006-02
Town of Krupp	Town Council	
City of Quincy	City Council	06-125
Town of Mattawa	Town Council	06.05.05
City of Moses Lake	City Council	
City of Soap Lake	City Council	725
City of Royal City	City Council	06-01
City of Warden	City Council	05-06
Town of Wilson Creek	Town Council	06-01
Coulee-Hartline School District	School Board	4-05-06
Grand Coulee Dam School District	School Board	05/06-02
Ephrata School District	School Board	2005-06-12
Quincy School District	School Board	7-06
Moses Lake School District	School Board	2006-2
Soap Lake School District	School Board	05-08
Wahluke School District	School Board	09-06
Wilson Creek School District	School Board	167-202
Grant County PUD	Board of Commissioners	
Port of Ephrata	Board of Commissioners	497
Port of Hartline	Board of Commissioners	
Port of Royal Slope	Board of Commissioners	2006.02
Port of Mattawa	Board of Commissioners	209
Port of Moses Lake	Board of Commissioners	1230
Port of Warden	Board of Commissioners	
Fire Protection District #3	Board of Commissioners	06-04-02

Agency/Jurisdiction	Approving Entity	Resolution Number
Fire Protection District # 4	Board of Commissioners	
Fire Protection District #6	Board of Commissioners	2006-06
Fire Protection District #7	Board of Commissioners	05-10-2006
Fire Protection District #8	Board of Commissioners	2006-03
Fire Protection District #10	Board of Commissioners	2006-01
Fire Protection District #11	Board of Commissioners	
Fire Protection District #12	Board of Commissioners	

Note: See **"Appendix B"**, in Chapter 5 for the resolutions adopting the plan.

Plan Development Process

The Disaster Mitigation Act of 2000
In the past, federal legislation has provided funding for disaster relief, recovery, and hazard mitigation planning. The Disaster Mitigation Act of 2000 is the latest legislation to improve this planning process and was put into motion on October 10, 2000, when the President of the United States signed the Act (Public Law 106-390). The new legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur.

The Disaster Mitigation Act of 2000 is intended to facilitate cooperation between state and local authorities, prompting them to work together. It encourages and rewards local and state pre-disaster planning and promotes sustainability as a strategy for disaster resistance. To implement the new Disaster Mitigation Act of 2000 requirements, the Federal Emergency Management Agency (FEMA) prepared an Interim Final Rule, published in the Federal Registry on February 26, 2002, at 44 CFR Parts 201 and 206, which establishes planning and funding criteria for state and local governments.

Grant County Mitigation Strategy:
The primary purpose of hazard mitigation is to identify community policies, actions, and tools for implementation over the long term that will result in a reduction in risk and potential for future losses county-wide. This is accomplished by using a systematic process of learning about the hazards that can affect the community, setting clear goals, identifying appropriate actions, following through with an effective strategy, and keeping the plan current.

Mitigation shall be included within current land use planning and code enforcement as a means of enhancement and creating higher standards for protection of new building or infrastructure. Examples are given within this plan such as restricting placement of structures that would allow more dense populations in areas of high risk. Another example is an initiative that addresses design and retrofit of water systems to minimize potential for disruption of services during disaster. Wind damage is rated the most damaging and recurring natural hazard of which this plan addresses initiatives: to reduce losses, through design in new buildings and retrofit of existing construction.

Local Involvement:
All of the jurisdictions included in the Grant County All-Hazards Mitigation Plan contributed to the development of the plan through the dedication of staff time to oversee the development of the plan, assist in writing the plan, and/or compile jurisdiction-specific information contained in the plan such as jurisdiction profiles and hazard risk assessments. In addition, each jurisdiction participated in reviewing and commenting on the draft of the plan through a public review process which will continue after plan approval.

The Grant County All-Hazards Mitigation Plan is the result of a grass-roots effort on the part of local jurisdictions, special purpose districts, agencies, and citizen involvement. The writing and organizing of the plan was performed by Joy Reese, current; and Randy Nichols, former Mitigation Project Coordinators of Grant County Emergency Management.

It is important to note that the development of this plan has been beneficial to the citizens of Grant County if just for the fact that such a large number of various entities have come

together to accomplish a common goal. Without the overwhelming cooperation on the part of all of the participating entities that contributed information and/or their own version of effort toward the finished product, this multi-jurisdictional plan could not have been written.

Important dates and elements in the plan development process:

Date	Task Force	Location
10/07/04	Emergency Management staff met with State Mitigation Officer, Martin Best. Received guidance from him for the project.	Moses Lake
09/29/04	Discuss and organize the Hazard Mitigation Planning Process and Determine scope of the project. Emergency management met with key leaders.	Moses Lake Emergency Management
09/29/04	The, first large multi-jurisdictional Hazard Mitigation Task Force meeting. Shared information on the goals of the planning process and the experience of other jurisdictions. Decided that the Task Force would meet once a month until data collection and hazard identification and vulnerability analysis was complete. (Eighteen attendees from municipalities, county, fire, schools, health, ports and emergency management.)	Moses Lake Fire Station #1
9/29/2004	The second multi-jurisdictional Hazard Mitigation Task Force meeting. Shared information on the past disasters that have impacted Grant County. Solicited information on historical natural disasters occurring in their jurisdictions. Divided group up into five regional planning areas comprised of the jurisdictions, schools, ports, fire industry and other organizations. Each regional group worked separately to identify, rate their own vulnerability to the various natural hazards. Set dates/times/locations for the subsequent Regional Group meetings. (Sixteen attendees)	Moses Lake Fire Station #1
12/02/04	The third multi-jurisdictional Hazard Mitigation Task Force meeting. Presentation training on characterizing mitigations initiatives. (Ten attendees)	Moses Lake Fire Station #1
07/28/05	The fourth multi-jurisdictional Hazard Mitigation Task Force meeting. Presentation on natural hazards, hazard mitigation and the all-hazards approach. Update on plan progress, discussion of future technological research and discussion. (Eight attendees)	Moses Lake Emergency Management
09/13/05	The fifth multi-jurisdictional Hazard Mitigation Task Force meeting. Presentation and discussion on technological hazards in Grant County. Instruction on jurisdiction profiling. (Twelve attendees)	Moses Lake Emergency Management
	Planning Meetings	
11/10/04	*Moses Lake/Warden Central Regional Planning Group* Regional Planning Meeting. Worked through mitigation	Moses Lake Fire Station #1

	requirements, discussed proposed initiatives, and decided on course of action for the participants. (Eight attendees)	
11/18/04	*Quincy/George Regional NW Planning Group* Regional Planning Meeting. Worked through mitigation requirements, discussed proposed initiatives, and decided on course of action for the participants. (Seven attendees)	Quincy City Hall
11/18/04	Grant County Multi-jurisdictional Coordinated Geographical Information System Meeting. Presentation about Hazard Mitigation and GIS role in Critical Facility mapping.	Port of Moses Lake
11/19/04	*Ephrata/Soap Lake/Wilson Creek N Regional Planning Meeting* Worked through mitigation requirements, discussed proposed initiatives, and decided on course of action for the participants. (Five attendees)	Ephrata City Hall
11/23/04	*Mattawa/Royal City SW Regional Planning Group* Regional Planning Meeting. Worked through mitigation requirements, discussed proposed initiatives, and decided on course of action for the participants. (Ten attendees)	Wanapum Dam Engineering
11/30/04	*Grand Coulee/Coulee City/Electric City/Coulee Dam NE Planning Group* Regional Planning Meeting. Worked through mitigation requirements, discussed proposed initiatives, and decided on course of action for the participants. (Nine attendees)	Grand Coulee City Hall
12/02/04	Town of Mattawa Council Meeting. Presentation on Hazard Mitigation Planning and its importance to the region.	Mattawa
09/27/05	Town of Coulee City Meeting. Presentation on technological hazards, discussion on critical facilities and jurisdiction profiling for technological hazards.	Coulee City Town Hall
09/28/05	Royal City Area Meeting. Presentation on technological hazards, discussion on proposed initiatives, critical facility information and profiling for technological hazards.	Royal City Fire Station District #10
12/06/06	Presentation on mitigation planning to encourage industry involvement.	EKA Chemical
03/06/06	Town of Hartline Town Council Meeting. Presented information on the plan and discussed the area's risks. Shared information on initiative development.	Hartline Town Hall
03/14/06	Town of Coulee City Meeting. Presented planning updates and led discussion on initiative development. (Five attendees)	Coulee City Town Hall
03/14/06	Presented Buffer Zone plan again to the Wheeler Corridor Community Awareness Panel meeting. This is a regular meeting for the public and industry in the Moses Lake area.	EKA Chemical
03/28/06	Presented updated information on the plan at the Ephrata School Board regular meeting. The group discussed moving their existing mitigation plan initiative to another area due to a flood hazard.	Ephrata

Public Information

11/18/04	Presentation to service club about Hazard Mitigation Planning and their role in emergency preparedness.	Moses Lake Kiwanis Meeting
11/18/04	Grant County Multi-jurisdictional Coordinated Geographical Information System Meeting. Presentation about Hazard Mitigation and GIS role in Critical Facility mapping.	Port of Moses Lake
12/02/04	Town of Mattawa Council Meeting. Presentation on Hazard Mitigation Planning and its importance to the region.	Mattawa
11/21/05	Soap Lake Revitalization Team Meeting. Presentation on Hazard Mitigation Planning in Grant County.	Soap Lake City Hall
01/25/06	Moses Lake / Warden Regional Public Review Meeting. Presentation and discussion of the plan. Public service announcement on local radio station. (2 attendees)	Moses Lake Fire Station
02/02/06	Soap Lake / Ephrata Regional Public Review Meeting. Presentation and discussion of the plan. Public service announcement on local radio station; flyers posted locally and a community notice in the Grant County Journal local newspaper.	Ephrata City Hall
02/02/06	Southwest Regional Public Review opportunity at the Mattawa Disaster Preparedness Fair. Ongoing slide show about the plan and discussion to interested viewers. Flyers posted locally.	Mattawa Intermediate School Gym
02/13/06	Northeast Regional Board of Mayors Meeting. Brief presentation on the plan to the four board members and public attendees.	Grand Coulee City Hall
02/15/06	Royal Slope Local Emergency Planning Committee Meeting. Presentation on the plan to the LEPC and other community members. Flyers posted and distributed locally.	Grant County Fire District 10 Station, Royal City
02/22/06	Quincy / George Local Emergency Planning Committee Meeting. Presentation on the plan to the LEPC and other community members.	Quincy City Hall
	Steering Committee	
11/01/04	Presentation to Grant County Department Heads, including the Grant County Commissioners, Solicited support on the project. The Commissioners signed Resolution 4-128-CC supporting and endorsing Hazard Mitigation Planning.	Ephrata
12/1/2004	Discussed Hazard Mitigation Bylaw draft document. Reviewed and endorsed two Mitigation Initiatives	Moses Lake

Two (2) copies of the promulgated Grant County Hazard Mitigation Plan were delivered to the Washington State Military Department, Emergency Management Division, and Camp Murray, Washington. NOTE: One of these copies will be forwarded to Region 10 FEMA by Washington State Military Department, Emergency Management Division staff.

Plan Maintenance

Evaluating and Updating the Plan
The Grant County All-Hazards Mitigation Plan will be reviewed on an annual basis to determine the effectiveness of mitigation programs, projects, or other related activities and to reflect changes in land development or programs that may affect mitigation priorities and/or strategies. The plan will be updated every five years. Five-year updates will be delivered to the Washington State Hazard Mitigation Program Manager for review and forwarding to the Federal Emergency Management Agency, Region X Office.

Annual Plan Review
In an effort to facilitate the annual plan review process, the task force will be retained as the Grant County Hazard Mitigation Planning Committee, becoming a semi-active group following the formal adoption of this plan and shall be charged with the responsibility of conducting an annual plan review during the months of October - December of each calendar year. The Director of Grant County's Department of Emergency Management or his/her designee will be responsible for organizing the annual plan review process with members of the Grant County Hazard Mitigation Planning Committee.

The Grant County Hazard Mitigation Planning Committee will review the current hazard mitigation strategies to determine their relevance to changing situations within Grant County as well as known changes in State or Federal policy, and to insure these mitigation strategies are addressing current and expected conditions.

Following the annual plan review process, Grant County's Department of Emergency Management will prepare a written report describing: 1) the plan review process; 2) the status of any current mitigation activities or projects; 3) any deficiencies identified as a result of the plan evaluation. Copies of this report shall be mailed to the governing body of each of the participating jurisdictions no later than February 28th of each calendar year. In addition, a copy of this report will also be mailed to the Washington State Hazard Mitigation Program Manager no later than March 30th of each calendar year.

The governing body of each of the participating jurisdictions shall approve the updated plan and a copy of the updated plan shall be submitted to the Washington State Hazard Mitigation Program Manager no later than April 30th of the update year.

PLAN EVALUATION AND UPDATE SCHEDULE 2006 – 2010

Date Required	Action to be taken
October – December 2006	Conduct plan review and public meeting
February - March 2007	Submit written report to Washington State Hazard Mitigation Officer
October – December 2007	Conduct plan review and public meeting

February – March 2008	Submit written report to Washington State Hazard Mitigation Officer
October – December 2008	Conduct plan review and public meeting
February – March 2009	Submit written report to Washington State Hazard Mitigation Officer
October – December 2009	Conduct plan review and public meeting
February – March 2010	Submit written report to Washington State Hazard Mitigation Officer
October – December 2010	Director of Grant County's Department of Emergency Management directs plan to be updated.
January 2011	Grant County Hazard Mitigation Planning Committee and Emergency Management complete the update process. Reports of all mitigation activities and/or projects from all participating jurisdictions.
February 2011	Conduct at least one public meeting regarding the plan update; receive comments from Planning Committee Members, stakeholders, and the public; make revisions as may be necessary. Updated plan approved by all participating entities by February 28th, 2011.
March 2011	Submit updated plan to Washington State Hazard Mitigation Officer and the Federal Emergency Management Agency.

The review process for the next five years will begin in the month of October, 2011.

Continued Public Involvement

All participating entities are dedicated to the continued involvement of the public in the hazard mitigation process. A public review process will be available so that citizens may express concerns, opinions, or ideas about the Grant County All-Hazards Mitigation Plan.

Copies of the Grant County All-Hazards Mitigation Plan will be kept and made available for public review at the following locations:

- Grant County Department of Emergency Management
- Grant County Planning & Building Department
- Grant County's website: www.co.grant.wa.us

A notice of the annual review process will be publicized annually during the month of October in local newspapers in Grant County. Grant County's Department of Emergency Management shall be responsible for receiving, tracking, and filing public comments regarding the Grant County All-Hazards Mitigation Plan. Contact information for Grant County's Department of Emergency Management is included in the Point of Contact information page, after the Title Page. A public meeting will be held as a part of the annual plan review process as well as the five year plan update. Additional meetings may

also be held as deemed necessary by the Director of Grant County Emergency Management.

Assessment after a Significant Disaster Event

Following a significant disaster impacting Grant County, the Mitigation Planning Committee should begin an analysis of the event to capture any "lessons learned" for the purpose of continuing development of the plan. An assessment of direct and indirect damage as well as any response and recovery costs will be determined. The committee will also assess the type and extent of the damage to determine any new mitigation initiatives that should be incorporated into the plan. The results of the assessment will be provided to those affected jurisdictions for their review and to provide information to be used when considering new mitigation initiatives. These activities should be commenced within 90 days of the event unless the recovery process warrants that additional time be allowed.

Revisions between Plan Updates

This section intends to clarify questions that have been raised during the planning process regarding an entity's ability to update, modify or amend its material in the plan between plan updates which will occur every five years.

Can a new entity become part of the county wide hazards mitigation plan between updates?

• Yes – but only with the following protocol:

1. Grant County's Department of Emergency Management, as lead agency would provide the new entity with a copy of the Grant County All-Hazards Mitigation Plan, local planning requirements, and any other pertinent data.

2. The new entity would then develop a plan that coordinates with the multi-jurisdictional plan and meets all of the planning requirements specified in 201.66 of 44 CFR of the Disaster Mitigation Act of 2000. Portions of the multi-jurisdictional plan that meet the planning requirements for that entity could be referenced in the plan eliminating the need for redundancy.

3. The new entity would then submit the completed plan to Grant County's Department of Emergency Management for review and comment to ensure conformance with the Grant County All-Hazards Mitigation Plan.

4. Grant County's Department of Emergency Management would then forward the new entity's plan to the Washington State Hazard Mitigation Program Manager for review. Subsequent to validation, the State would forward the plan to FEMA for review/approval.

5. The new entity would forward the approved plan to the Grant County's Department of Emergency Management for incorporation into the existing Multi-jurisdictional Hazard Mitigation Plan for Grant County.

6. The new entity would become part of the planning committee and would commit to participate in future plan updates and maintenance cycles.

Can an entity reprioritize their mitigation initiatives?
• Yes – but only with the following protocol:

1. Before the action is taken, the entity sends a letter of intent to the Mitigation Planning Committee and other entities who have adopted the plan.

2. The entity's decision-making body formally adopts the revised priority list following that organizations protocol for public process and notification.

3. The entity sends a copy of the revised priority list to the Mitigation Planning Committee, the entities who have adopted the plan, State Emergency Management and FEMA;

4. The entity will notify the Mitigation Planning Committee when it has received State and FEMA approval of the changes.

Can an entity adopt new mitigation initiatives or drop existing ones between plan updates?
• Yes – but only with the following protocol:

1. The entity sends a letter of intent to amend the plan to the Mitigation Planning Committee and the other entities who have adopted the plan before the action is taken;

2. The entity prepares the new mitigation initiative(s) or indicates which are being dropped using the "Mitigation Initiatives Characterization Form";

3. The entity holds a public hearing with an appropriate level of public notification regarding the new mitigation initiative(s) and the new prioritization;

4. The entity's decision-making body formally adopts the new mitigation initiative(s) or drops the existing ones, and new prioritization list;

5. Within a month of the entity's action, it sends a copy of the new mitigation initiative(s) and new prioritization to the Mitigation Planning Committee, all the other entities which have adopted the plan, the State Emergency Management, and to FEMA, and;

6. The entity will notify the Mitigation Planning Committee when it has received State and FEMA approval of the changes. Any changes or approvals, which have been

made to a governmental entity's mitigation initiatives shall be incorporated into the next county wide plan update.

Implementation through Existing Programs

Local governments will retain responsibility for implementation of mitigation planning and activities. The Grant County All-Hazards Mitigation Plan is a multi-jurisdictional plan and the mechanism for implementation will be accomplished through existing programs now in place within Grant County and fourteen cities and towns; including the GMA (Growth Management Act).

Some existing programs which mitigate risks in Grant County are:

Land Use Planning

Each local government, county, city and town has an active land use management program. Whether supported by full or part time employment, each have addressed land use requirements under State law and developed actions for the Growth Management Act (GMA). It should also be noted that each program is coordinated in concept and activities through multiple capabilities. Cities and towns share and review land management practices through their association of cities and towns. Also, cities, towns and county, as developed in the GMA planning, coordinate proposed development activities through a comprehensive review process. These activities assure compliance to GMA and land use issues and also include mitigation practices. These practices include but are not limited to; (1) incorporating flood plain management in land use zoning and a development review process for compliance, (2) prohibition of construction within identified flood ways and flood way easements and, (3) restriction of building heights within airport runway conical zones.

Building Code and Enforcement

Building Code used in Grant County is based on the International Building Code (IBC) standards. The State of Washington has adopted the IBC and this is what gives Counties the requirements. These requirements are designed to provide safety for the public and emergency responders alike. It controls such things as occupancy, ceiling height, and building access and egress. It also controls construction in a flood plain which has a requirement that the structure meets the minimum standard of one foot above the flood way. New structures are also built to seismic hazard standards which may include seismic hold-downs on the structure or shear panels to provide protection from ground movement. In order to be in compliance, all new construction must be built to code. The Building Department inspects upgrades to existing structures and new construction for compliance. Sub-areas among the Building Code are Fire Code, Plumbing Code, Mechanical Code, and Residential Code. The Fire Code used is part of the Washington State Code that was developed in 1927. Fire and other codes are also designed to provide protection to the public.

County Roads

The Grant County Public Works Department follows the current structural design standards of the county for the development of new roads and other transportation structures such as bridges and culverts. The Road Engineer prepares these design standards which help to ensure public safety and compliance with sound engineering practices. These are implemented through their appropriate guidelines including new construction and upgrades to existing structures to meeting current design standards. These design standards are provided in resolution number 85-52-CC. Construction of new structures shall be in compliance with the current edition of the Washington State Standard Specifications of Road, Bridge and Municipal Construction. Plans and special provisions are submitted to the County Road Engineer, who inspects all road construction projects. Any construction found to be deficient must be brought into compliance before final approval is given.

Public Health Programs

The Grant County Health District provides services for Environmental and Personal Health. Environmental Health Programs include: Chemical/Physical Hazards, Drinking Water and, Food Protection Programs. Personal Health Programs include: Immunization Services, Communicable Disease and, Child Care Programs among others. The Health District also provides Public Health Advisories which the Health Officer implements. The Health District provides public information through health fairs, attending public meetings and engaging in community outreach.

Special purpose districts also apply these same principles and/or participate in these programs. Many also have operational programs which are reviewed for operational planning and budgets annually.

To aid in the implementation, Grant County Emergency Management participates in land use management reviews for new projects; contacting new industry and businesses developing within the county or cities and towns. The review process provides a proactive approach to prompt developers to refer to codes, rules, and plans which attempt to control certain activities when proposed. These kinds of controls are well known and for the most part understood by the public which allows for a simple and acceptable implementation process.

Another program process available is the capital facilities plan of specific functions and services adopted by jurisdictions in specific detail not covered in the comprehensive plan. This marks those major infrastructure developments or facilities which the entity has identified as needing within a six, ten, or twenty year plan. When the capital facilities plans are updated, jurisdictions will consider the impact of the mitigation initiatives they chose for this plan and their incorporation.

EXECUTIVE SUMMARY

Grant County is threatened by a number of different types of natural and human-caused hazards. These hazards endanger the health and safety of the population of the community, jeopardize its economic vitality, and imperil the quality of its environment. Because of the importance of minimizing the vulnerabilities to these hazards, the public and private sector interests of Grant county have joined together to crate the Grant County Mitigation Task Force to undertake a comprehensive planning process that has culminated in the publication of this document: **"The Grant County All-Hazards Mitigation Plan"**. This is a multi-jurisdictional hazard mitigation plan, and the planning effort has been conducted through the coordinated, cooperative effort of local governments, industry, community groups, and other key participants.

In addition, an effort was made to solicit information from local, state and federal agencies and individuals with specific knowledge of certain hazards and past historical events, as well as recent planning decisions, zoning codes and ordinances adopted by local governments. The mitigation strategies contained within this plan are the result of a multi-jurisdictional planning process involving participating jurisdictions, special purpose districts, and a cross-section of the business community and citizens of Grant County. The framework of the Task Force was divided into two primary committees, Steering and Planning.

Establishment of the Grant County Hazard Mitigation Steering Committee

With the decision to develop a hazard mitigation plan, the steering committee was charged with the following responsibilities:

- Establish plan development goals and objectives.
- Establish a time line for completion of the plan.
- Insure that the plan meets the requirements of the Disaster Mitigation Act of 2000.
- Solicit and encourage the participation of municipalities, special purpose districts, stakeholders, and citizens in the plan development process.
- Assist local planning officials, special purpose districts and others in gathering information for inclusion in the plan.
- Organize and oversee the public involvement process.
- Gather all pertinent information to be included in the plan.
- Each member of the Steering Committee agrees to be a member of the Planning Committee.

Input from the Grant County Hazard Mitigation Planning Committee

The Planning Committee convened as a means to gather and share information, assess vulnerabilities, identify critical facilities, assist in developing mitigation strategies, and provide continuity throughout the plan development process to insure that jurisdictional-specific hazards

vulnerability information and mitigation strategies were incorporated into the plan. In addition, five regional subgroups of the Planning Committee have conducted meetings to address their own hazard vulnerability analysis and to work on area hazard mitigation strategies.

Three Basic Objectives

The Grant County Mitigation Task Force has conducted studies to identify the hazards threatening the jurisdictions of Grant County and to estimate the relative risks posed to the communities by those hazards. Because of the similarity in hazards that pose threats to the various communities within Grant County, a decision was made early in the plan development process that the plan should meet three basic objectives to serve the needs of the citizens of Grant County and governmental jurisdictions and agencies.

1. The plan should be multi-jurisdictional thereby satisfying the planning requirements as specified in the Disaster Mitigation Act of 2000 for participating jurisdictions in Grant County.
2. That the plan be developed following the process outlined by the Disaster Mitigation Act of 2000.
3. Development of the plan should promote intergovernmental cooperation supporting present and future emergency management efforts.

We were determined to not only meet the federal guidelines, but just as importantly, develop a framework of working relationships in the various geographical regions of Grant County. Early in the plan's development, we regionalized the planning efforts where Grant County was divided into geographical areas made up of the municipalities, port, school and fire protection districts, industry, and other community groups. Each regional group developed their own analysis of hazards in that area and developed strategies to address them through mitigation initiatives. Existing Local Emergency Planning Committees' (LEPCs) frameworks were used to develop the regional planning areas. We believed that the existing LEPCs would insure the development of a meaningful hazard mitigation document that they would be invested in maintaining and improving.

The information developed by the regional groups has been used by the Task Force to prioritize its planning efforts in order to assess the vulnerabilities of the facilities and neighborhoods of Grant County to the impacts of future disasters involving those hazards. With these vulnerabilities identified, the Task Force has worked to justify and prioritize specific proposals for projects and programs that will avoid or minimize these vulnerabilities.

These proposed projects and programs to reduce the impacts of future disaster are called "mitigation initiatives" in this document. They have been developed by the Task Force for implementation whenever the resources and opportunities to do so become available. Implementation of this plan is essentially through the implementation of the initiatives in the plan itself. With each implementation effort, the Task Force will continue to help make the participating communities more resistant to the human and economic loss of future disasters.

This document details the work of the Grant County Mitigation Task Force over the past several months to develop the planning organization, to undertake the needed technical analyses, and to coordinate the mitigation initiatives that have been proposed by the participating jurisdictions and organizations. This plan shall be submitted to the governing bodies for their adoption.

This plan will continue to be updated and expanded in the future to ensure it addresses changing conditions such as actual experiences with disasters or changes of the characteristics of the hazards as they occur. This updating process and future editions of the mitigation plan issued will also be used to continue to inform and involve the general public and other interested groups to fully participate in making the community more resistant to the impacts of future disasters.

Summary of Comprehensive Plans

Grant County Comprehensive Emergency Management Plan, 2004
Fire Mobilization Plan
Fixed Nuclear Facility Plan
Hazardous Materials Plan
Terrorism Plan
Grant County Public Utility District
Priest Rapids Hydro Electric Project Emergency Action Plan
Port of Moses Lake
Grant County International Airport Emergency Plan
Jet Aero/Port of Moses Lake Oil Spill Response Plan

This section summarizes the comprehensive plans located at the Grant County Department of Emergency Management. Many of these plans are exercised on an annual basis or more to include representatives from relevant public agencies. These exercises may be practiced at three different levels to include table-top, functional or full scale scenarios. A table-top exercise is an informal gathering in which officials, key staff and others with response duties discuss a simulated emergency situation. Participants evaluate plans, procedures and resolve questions under minimal stress. A functional exercise is one that is designed to test the operational capability of emergency management systems in an interactive manner. A functional exercise is more complex than a table-top due to time constraints, the simulation of accessing outside resources and an evaluation. In this process, no field units are used. During a full-scale exercise, operational capabilities are evaluated over a substantial period of time in a highly stressful environment. It involves the testing of a major portion of the emergency plan, organizations involved and is always formally evaluated. The Emergency Operations Center (EOC) is activated and field command posts may be established.

The Comprehensive Emergency Management Plan

This plan forms the basis for activities in the Emergency Management program in the phases of mitigation, preparedness, response and recovery. It functions to protect the people, property and the environment of Grant County from the impacts of emergencies or disasters. It outlines local government responsibilities while maintaining an EOC capable of providing communication, operations and resource coordination during an event. There are some planning assumptions which also guide the plan. It assumes that the public will use their own resources for the first three days of an emergency or disaster; that the EOC may be unable to fulfill all emergency resource requests and that local agencies will prepare for emergencies and report to the EOC by keeping it staffed and informed of damages. It demonstrates the responsibilities of an agency or department. At this time, the plan identifies 23 entities with Emergency Management

duties. The plan details the emergency support functions listed in the table below. The abbreviation G.C. represents Grant County.

FUNCTION	PRIMARY AGENCY	SUPPORT AGENCIES
Transportation	Public Works	Emergency Management G.C. Auditor Grant Transit Authority Public Schools
Communication and Warning	911 Dispatch G.C. Sheriff's Office Emergency Management	Law Enforcement Fire Emergency Medical Services Radio Amateur Communications
Public Works and Engineering	Public Works Departments	Emergency Management Building Departments Port Districts Grant County Public Utility District Private Sector Agencies (unlisted)
Firefighting	Fire Protection Districts Fire Departments	Emergency Management Law Enforcement Public Works / Engineering
Information Assessment and Planning	Emergency Management	Chief Elected Officials Local Government Agency Leaders American Red Cross
Mass Care	Emergency Management	Emergency Medical Services American Red Cross Private Sector Agencies (unlisted)
Resource Support	Emergency Management	Chief Elected Officials Local Government Agency Leaders American Red Cross Amateur Radio Volunteers
Health and Medical Services	G.C. Health District	Emergency Management Grant Mental Healthcare American Red Cross Emergency Medical Services G.C. Coroner
Search and Rescue	G.C. Search and Rescue	C.C. Sheriff's Office Emergency Management
Food and Water	Emergency Management	G.C. Health District G.C. Extension Services American Red Cross Private Sector Agency (unlisted)
Military Support to Civil Authorities	Emergency Management	G.C. Sheriff's Office Cities/Towns Police Departments
Recovery and Restoration	Emergency Management	Chief Elected Officials Local Government Agency Leaders American Red Cross

Law Enforcement	G.C. Sheriff's Office Cities/Towns Police Departments	911 Dispatch Emergency Management
Damage Assessment	Emergency Management	Chief Elected Officials Local Government Agency Leaders American Red Cross
Evacuation and Movement	Law Enforcement	Emergency Management Fire Services American Red Cross Grant Mental Healthcare Emergency Medical Services **Note:** Other support agencies may be added to the functions above, which will be determined by the hazard and scope of the disaster.

Some plans are included as part of the Comprehensive Emergency Management Plan (CEMP) which may or may not be published separately.

Fire Mobilization Plan, ESF-4B

The Mid-Columbia Regional Fire Defense Plan includes Adams, Chelan, Douglas, Grant and Okanogan Counties. Washington State Law provides for the development of regional defense plans. The purpose of the plan for the Mid-Columbia Region is to request and coordinate regional fire resources. As with many other resource allocations, local government is required to use local planning and local mutual-aid resources prior to requesting outside assistance. This plan includes fire resource plans for each county that will become the basis for regional or state fire mobilization. It identifies procedures for activation and deployment for a regional incident, a state mobilization incident, Department of Natural Resources / United States Forest Service incident and includes a section for definitions and establishes common terminology between counties. The Mid-Columbia Regional Fire Defense Plan may be activated when the county Fire Coordinator confirms that a chief, incident commander or designee makes the request and local resources are unable to gain control of the emergency. A checklist must be sent to the Mid-Columbia Region fire contact point; Douglas County Fire District #2. The Regional Fire Defense Coordinator then forwards the request to activate the State Mobilization Plan and the resources provided will be coordinated through that individual. The local Emergency Operations Center is activated to support the channeling and operations of these functions.

Fixed Nuclear Facility Plan, ESF-10B

Portions of Grant County are located within Emergency Planning Zones (EPZs). The purpose of this plan is to protect people, property and the environment in the event of a radiological or chemical incident at the Columbia Generating Station and the United States Department of Energy's Richland Operations Hanford Site. Ingestion is the largest risk for Grant County. It is possible that land, crops and gardens in the EPZs of Grant County would be affected by an accidental release at one of the sites. While it is extremely unlikely that such an incident would occur, the plan is exercised at the Grant

County Department of Emergency Management annually. The exercise is performed as a full-scale scenario, including the appropriate personnel from specified agencies in a stressful working environment while the Emergency Operations Center is activated. The earliest of precautionary measures is an issuance of an agricultural advisory when Food Control Areas are identified. Both the Columbia Generating Stations and the Hanford Site are organized to cope with an on site emergency and to make public recommendations for the protection of the general public. In order to mitigate this hazard, Grant County Emergency Management offers public education information and early notification and warnings.

Hazardous Materials Plan, ESF-10

This plan identifies hazardous materials as a hazard of high probability which emergency response agencies must handle. This plan attempts to ensure a safe response for all accidents involving hazardous materials. Some general assumptions are that business and industrial facilities in Grant County who comply with the Environmental Protection Agency or E.P.A. regulations have their own facility emergency response plans and have shared relevant information with local government and the surrounding community. These accidents can happen anywhere hazardous materials are produced, stored, transported or used at any time of the day or night. Due to the unpredictable nature of this hazard, it can also be assumed that spontaneous evacuations may occur without official notification. Protective actions will also be implemented dependent on factors such as the severity, location and urgency of the event. Local Emergency Planning Committees (LEPCs), created by a requirement of the E.P.A., will assist Grant County Emergency Management with the development and maintenance of the plan. To encourage mitigation of hazardous materials, some local industries and businesses have removed these types of products from their facilities by replacing them with safer substances or through relocating them to less densely populated areas.

Terrorism Plan, ESF-10C

The purpose of this plan is to minimize loss of life, protect property and restore order in the event of a terrorism incident. The scope of this plan addresses several consequences to terrorism including the effects upon people, their property and their local communities. Grant County will attempt to make every effort to respond in the event of a terrorism incident. Like other plans, there are some limitations and there is no guarantee implied by ESF-10C for a perfect response system. Also like other plans, there are some assumptions this function makes. The response will be determined by the material involved and by the authorities, plans and operations involved. Terrorism and civil disturbance are both addressed here, as they are same in nature of their characteristics. It is assumed that incidences of terrorism and/or civil disturbance will be treated as a crime scene in which law enforcement is responsible to suppress and control. The plan assumes that terrorist attacks may or may not be preceded with a threat or warning and are usually directed at facilities or areas that perform government, transportation or industrial services. Attacks may also occur at multiple locations or be accompanied with hazardous materials agents of chemical and/or biological origin. It is expected that the recovery process to a terrorist attack will be lengthy and may be complicated with additional

threats or physical damages that may contribute to psychological stress. Operations will be conducted using the Incident Command System.

Other plans stand alone and are not a part of the CEMP. Some of these plans may be exercised while others are not. The Grant County Department of Emergency Management keeps these plans at the Emergency Operations Center, as well as the plans listed above, for prompt access in case of an emergency.

Grant County Building Code

Grant County Building Code implements regulations relating to the design, construction, use, and occupancy of buildings within its boundaries. This also includes regulations with plumbing and mechanical aspects associated with structures. Inspections and enforcement help assure buildings are structurally sound and fire safe.

Services

The Building Department's function is to implement and enforce regulations relating to the design, construction, use and occupancy of buildings and structures located within this jurisdiction, along with the plumbing and mechanical associated with those structures.

The Fire Marshal's responsibilities include regulating pyrotechnic displays, providing information on and enforcing regulations relating to the Fire Codes and providing investigative assistance to local fire districts in determining the origin of fires.

The Office of Code Enforcement assists the public by investigating and enforcing violations of the Building and Fire Codes along with all of the Development Regulations established or regulated by the Planning Department including the Unified Development Code (UDC).

Priest Rapids Hydro Electric Project Emergency Action Plan

This plan contains information for three different hydro electric project locations within Grant County. These are Wanapum Dam, Priest Rapids Dam and the Potholes East Canal Project, which are owned and operated by the Grant County Public Utility District. Each location serves to provide energy for homes and other structures within and outside of Grant County. The goal of this plan is to minimize the loss of life and property in the event of an emergency. The plan’s purpose is to insure that populations downstream of each facility will receive adequate notification in the event of an emergency which may require evacuation in certain inundation areas. In order to achieve this, the plan distinguishes flow charts for notification procedures should a failure occur. The plan may be exercised annually or more if deemed necessary.

Port of Moses Lake Grant County International Airport Emergency Plan

This plan describes the types of incidents or accidents and their level of emergency that may happen on or near this airport. However, since not all kinds of emergencies can be anticipated, the Operational/Disaster Control Officer has the authority to change the plan within the guidelines of the Federal Aviation Administration. There are nine participating agencies identified in the plan with responsibilities to the Grant County International Airport in the case of emergencies. The plan identifies 3 different alert levels and the roles and responsibilities for all 3 levels. This plan is exercised annually and is coordinated with all participating agencies.

Jett-Aero/Port of Moses Lake Oil Spill Response Plan

This plan contains a spill response flowchart starting with the discovery of a spill and ending with restoration and reports submittal. It also contains a list of equipment, an evacuation plan, an emergency notification phone list and facility diagrams. This plan is not exercised.

Summary Conclusion:
The plans identified above are located at the Grant County Department of Emergency Management. If a plan is not mentioned above, it may be under construction, in a section of one of the plans already listed, or already referenced in this document. Some plans are exercised annually and the scenario may be presented in a table-top, functional or full scale exercise which is determined by individual grant and licensing requirements of the agencies involved. A plan's scope of work may also contribute to that determination. In order to access State or Federal resources in the event of a natural or technological disaster, local resources must be consumed first. Communities should be prepared to support themselves for approximately the first 72 hours of a disaster. The Grant County Department of Emergency Management provides public education in how to be prepared for several different types of disasters and recommends that individuals, families and businesses have their own emergency preparedness plan.

How to Use This Plan

Each section of the Grant County Hazard Mitigation Plan provides information to assist local governmental jurisdictions and agencies and the citizens of Grant County in understanding the community in which we live and work and the hazard related issues facing government, citizens, businesses, and the environment. Combined, the various sections of this plan work together to create a document that guides the mission to reduce vulnerability and minimize loss from future natural and technological or 'human-caused' hazard events. The structure of this plan enables people to use only that portion of the plan that is of interest to them and/or pertains to their needs. It also allows local government to review and update specific sections as new data becomes available. New data can be easily incorporated, resulting in a hazard mitigation plan that remains current and relevant to the needs of the citizens of Grant County.

In many cases, the word "entity" is found in the plan. For the purposes of this plan, "entity" refers to all of the various local governmental jurisdictions and special purpose districts that participated in the development of this plan.

The Grant County Hazard Mitigation Plan is organized into five chapters. Chapter 1 contains the introduction and an overview of the planning process. Chapter 2 contains information regarding the various natural and technological hazards that can affect Grant County. Chapter 3 contains the goals and objectives of this plan. Chapter 4 contains multi-jurisdictional community profile information, jurisdiction-specific vulnerability assessment information and mitigation strategies for each jurisdiction and special purpose district that has participated in the hazard mitigation planning process. Chapter 5 contains the various appendices to the plan.

ACKNOWLEDGEMENTS

The Grant County All-Hazards Mitigation Planning Committee

Municipalities

- Town of Coulee City:
  - Robert Little, Mayor
  - Alta Paulson, Clerk
  - Don Rushton, Fire Chief
    Jurisdiction Profiling, Initiative Development, Risk Assessment, Critical Facilities

- Town of Electric City:
  - Laurie Hilton, City Clerk
    Jurisdiction Profiling

- City of Ephrata:
  - Chris Jacobsen, Mayor
  - Joe Varick, Police Chief
  - Jeremy Burns, Fire Chief
  - Wes Crago, City Administrator,
  - Ron Sell, Community Development Director
    Initiative Development, Plan Review, Risk Assessment, Jurisdiction Profile, Mapping, Critical Facilities

- Town of George :
  - Wallace Bushman, Public Works Director
    Jurisdiction Profiling, Risk Assessment, Initiative Development, Plan Review

- City of Grand Coulee:
  - Tamara Byers, Mayor,
  - Sgt. John Tuff, Police Dept
    Jurisdiction Profiling, Risk Assessment

- Town of Hartline:
  - Helen Groh, City Clerk,
    Jurisdiction Profiling, Risk Assessment, Initiative Development
    Initiative Development for Fire District #6

- Town of Krupp
  - Tracey Lessor, Mayor
    Jurisdiction Profiling

- Town of Mattawa:
    - Judy Esser, Mayor
    - Patricia Gerdes, City Clerk
    - John Lasen, Public Works Director
      Jurisdiction Profile, Initiative Development, Critical Facilities, Risk Assessment

- City of Moses Lake:
    - Tom Taylor, Fire Chief
    - Dave Helms, Former Fire Chief
      Jurisdiction Profiling, Plan Review

- City of Quincy:
    - Dick Zimbelman, Mayor
    - Tim Snead, City Administrator
      Initial Plan Development, Jurisdiction Profiling

- City of Royal City:
    - Harry Yamamoto, Public Works Director
      Jurisdiction Profiling, Critical Facilities, Risk Assessment, Plan Review

- City of Soap Lake :
    - Maynard Hagen, City Councilman,
      Jurisdiction Profiling, Critical Facilities, Initiative Development, Risk Assessment, Plan Review

- City of Warden:
    - Mike Thompson, Administrator
      Jurisdiction Profiling, Critical Facilities, Risk Assessment, Plan Review

- Town of Wilson Creek:
    - Katherine Bohnet, Mayor
    - Susan James, Clerk
      Jurisdictional Profiling, Initiative Development and Plan Adoption

Grant County Government

- Grant County Emergency Management:
    - Sam Lorenz, Director
    - Michele Haughton, Senior Coordinator
      Consultation and Research, Initiative Development, Plan Review
    - Randy Nichols, Former Mitigation Project Coordinator
    - Joy Reese, Mitigation Project Coordinator

- Grant County Health District:
    - Roger Arrango, Public Health Emergencies Coordinator

- Daniel Wilson, Registered Sanitarian
  Consultation and Research, Initiative Development, Plan Review

- Grant County Public Works:
  Derek Pohle, Road Engineer
  Initiative Development

- Grant County Geographical Information Systems:
  - Megan Smith, Technical Analyst
  - Mapping

Hospital Districts

- Hospital District #5**:**
  - Debra Howey, Administrator
    Critical Facilities, Initiative Development

- Hospital District #6:
  - Greg Hanoff, Hospital Administrator
  - Penny Lewis, Staff
    Critical Facilities, Initiative Development

Industry

- E.K.A. Chemical:
  - Lind Bingham, Environment Health and Safety Manager
    Soliciting Industrial Involvement, Buffer Zone Planning

- Solar Grade Silicon:
  - Jon Mathis, Health and Safety
    Buffer Zone Planning

- Quincy Foods:
  - Bruce Miller, Safety Operations
    Consultation

- Williams Gas Pipeline-West:
  - Dorothy Peterson, Operations Technician
    Consultation, Plan Review

- Columbia Foods:
  - Bill Wagoner, Technical Services Coordinator
    Consultation

Neighboring Jurisdiction Consultations

- Dan Greer, Emergency Management, Kittitas County Sheriff's Office
- Eileen Ervin, Specialist, Chelan County Emergency Management

- Jay Weise, Emergency Management, Adams County Sheriff's Office
- Steven Williams, Program Coordinator, Franklin County Emergency Management

Port Districts

- Port of Ephrata:
  - Barbara Deycous, Former Manager
  - Mike Wren, Manager
    Jurisdiction Profiling, Initiative Development

- Port of Hartline:
  - Taffy Wright, Secretary

- Port of Mattawa, Port of Warden:
  - Mike Conley, Manager
    Initiative Development

- Port of Moses Lake
  - Robert Crozier, Fire Chief

- Port of Royal Slope:
  - Cathy Potter, Manager
    Jurisdiction Profiling, Initiative Development, Plan Review

Public At Large

- Birdie Bloxton, Moses Lake Community
  Public Review

- Gloria Ogoshi, Quincy Community
  Public Review

Public Safety

- City of Ephrata:
  - Joe Varrick, Police Chief
    Plan Review

- City of Grand Coulee:
  - John Tuft, Police Sergeant
    Jurisdiction Profile, Critical Facilities, Risk Assessment

- City of Moses Lake:
  - Dave Helms, Former Fire Chief
    Jurisdiction Profiling, Initiative Development

- City of Quincy:

- Randy Coleman, Police Sergeant

- Grant County Fire District #3:
  - Anthony Leibelt, Battalion Commander
    Jurisdiction Profiling, Critical Facilities, Initiative Development, Plan Review, Risk Assessment

- Grant County Fire District #4:
  - Bob Whitaker, Fire Chief
    Initial Plan Development

- Fire District #7:
  - Kirk Shepard, Fire Chief,
    Jurisdiction Profiling, Critical Facilities, Initiative Development

- Fire District #8:
  - Dave Hargroves, Fire Chief
    Initiative Development

- Fire District #10:
  - Bill Greenway, Fire Chief
    Initiative Development, Consultation, Plan Review

- Grant County Sheriff's Office:
  - Jon Melvin, Deputy
  - John Turley, Chief Deputy
    Consultation and Research, Initiative Development

- Port of Moses Lake:
  - Robert Crozier, Fire Chief
    Jurisdiction Profiling, Initiative Development

School Districts

- Coulee-Hartline School District:
  - Facilities Manager
    Initiative Development, Critical Facilities

- Grand Coulee Dam School District:
  - Facilities Manager
    Initiative Development, Critical Facilities

- Ephrata School District:
  - Rocke Witte, Facilities Manager
  - Bill Busse, School Principal
    Initiative Development

- Moses Lake School District:
    - Paul Clark, Facilities Manager
    - P.J. DeBenedetti, Assistant Superintendent
      Initiative Development, Plan Review, Critical Facilities

- Quincy School District:
    - Tom Harris, Facilities Manager
      Initiative Development, Critical Facilities

- Soap Lake School District:
    - Heidi Cline
      Initiative Development

- Wahluke School District:
    - Tim Schrag, Facilities Manager
      Initiative Development, Critical Facilities

- Wilson Creek School District:
    - Boh Nolan, Facilities Manager
      Initiative Development

Utility Districts

- Grant County Public Utility District:
    - John Daling, Emergency Action Plan Coordinator
    - Gary Garnant, Public Information Officer
      Initiative Development, Critical Facilities, Public Information, Consultation

Hazard Profiles

NOTE: The pages that follow discuss the hazards that have a potential to affect Grant County. The hazards profiled in this section were selected using the Mitigation 20/20 software program. More research is being conducted on the infestation/disease hazard and where it is identified in the plan, it is a general estimation. It is the Planning Committee's intent to recommend that it be included in more detail during the next regular plan update. The technological hazards (or human-caused hazards) were determined by the committee members and were adapted in the Mitigation 20/20 software program to reflect Grant County's planning needs. One of the technological hazards not discussed in detail in this plan is terrorism. This is due to concerns about the safety of the general public. Some of the document titles' names are not hazards in themselves and were titled as such for simplicity.

Hazard Rating Process

The Washington State Military Department, Emergency Management Division, provided Grant County Emergency Management with a copy of the 20/20 Hazard Mitigation software to help conduct a systematic risk assessment of each incorporated city as well as the unincorporated portions of the county. Using the scoring matrix from the 20/20 program, a risk assessment was conducted for the following hazards:

Civil disturbance
Drought
Earthquake
Flood
Hail
Hazardous materials
High winds
Infestation or disease
Land movement
Lightning
Utility shortage or failure
Major fire – urban/wild land
Radiological Hazards
Severe winter storm
Special Hazards
Transportation Hazards
Volcanic activity

To begin the risk analysis process, each jurisdiction used a subjective evaluation based on historical events by assigning numerical values for each hazard based upon the following risk categories:

- The area(s) impacted by the hazard (ranked 0 – 4)
- Probability of health and safety consequences (ranked 0 – 3)
- Probability of property damaged or destroyed (ranked 0 – 3)
- Probability of environmental damage (ranked 0 – 3)
- Probability of economic disruption (ranked 0 – 3)

In addition, a Probability or Frequency of Occurrence value was assigned to each hazard (ranked 1–5) based upon the known frequency of incidents resulting from each hazard. For each hazard, the numerical values for each risk category were totaled (with a maximum possible score of 16) and this number was then multiplied by the Probability or Frequency of Occurrence value to determine the risk rating for each natural hazard.

It was evident early on in the hazard identification and risk analysis that natural hazard events such as severe winter storms, wind, drought and volcanic activity were of the most concern of the Task Force participants. Grant County Department of Emergency Management provided each Task Force member with the historical record of the worst hazard events affecting Grant County. Then they were asked to supplement this record with events that affected their geographical area but were not listed on the material sent to them. Once these additional hazard events were added to the historical record the risk analysis was conducted.

Grant County is comprised of an extraordinary mix of taxing entities each with its own mandated authority and having too often multiple overlapping jurisdictional lines. There are 15 municipalities along with Grant County government. There are 7 hospital districts, 15 fire districts, 13 school districts, 10 port districts, and a variety of water, mosquito, park and cemetery districts. To make sense of this confusing organizational mix, many led by unpaid elected and appointed officials, a regional approach was used.

At the October 27, 2004 Hazard Mitigation Planning Task Force Meeting these taxing entities were divided into five regional area work groups. Using the supplemented historical record of hazard events each regional subgroup was tasked with performing its own “regional” hazard identification and risk analysis. Using the format provided in the 20/20 software each of these subgroups completed the hazard risk analysis for their particular area of Grant County.

By conducting the analysis regionally we accomplished two additional goals, beyond sorting out the confusing organization quilt work of the county with over half the entities not being represented at the meetings. First, the data anomalies, the extreme highs and lows, were averaged out by the consensus. Second, these regional efforts provided the participants an opportunity to plan together as a region in a multi-disciplinary way. By sharing information and experiences, from representatives with different organizational viewpoints, each added their own assessment of the same hazard events. The process elicited some promising ideas of about

sharing resources and coordinating efforts which were eventually reflected in the cooperative initiative measures that were later proposed. It was suggested that the Local Emergency Planning Committees (LEPCs) in each region would serve as an ongoing vehicle to strengthen a wide array of emergency planning efforts, including hazard mitigation.

Using the ratings developed by each of the five regional subgroups Emergency Management staff developed a "Composite" Hazard Identification and Risk Analysis for all of Grant County by averaging the regional results. Because the most pressing risk identified by every group was "weather related" (severe winter storms, wind, drought), along with the threat of volcanic activity, it is not surprising that the differences of risk between regions was very minor.

Additionally, the amount of risk experienced by these hazard events in the past and expected in the future was nearly the same regardless of the jurisdictional area. This analysis is confirmed by quantifiable historical data. The five Grant County weather reporting stations have an average annual precipitation variance between them of only a little over 3 inches. Wind can be serious risk factor in the Columbia River Gorge, but serious wind related events also occur throughout Grant County. Thunderstorms can severely impact a community, however neighboring jurisdictions no more than ten miles away may only experience a hint of the storm. As a result of the May 18, 1980 violent eruption of Mount St. Helens volcanic ash crippled neighborhoods throughout Grant County. Yet fifty miles away from the distribution pattern some communities received only a dusting of ash.

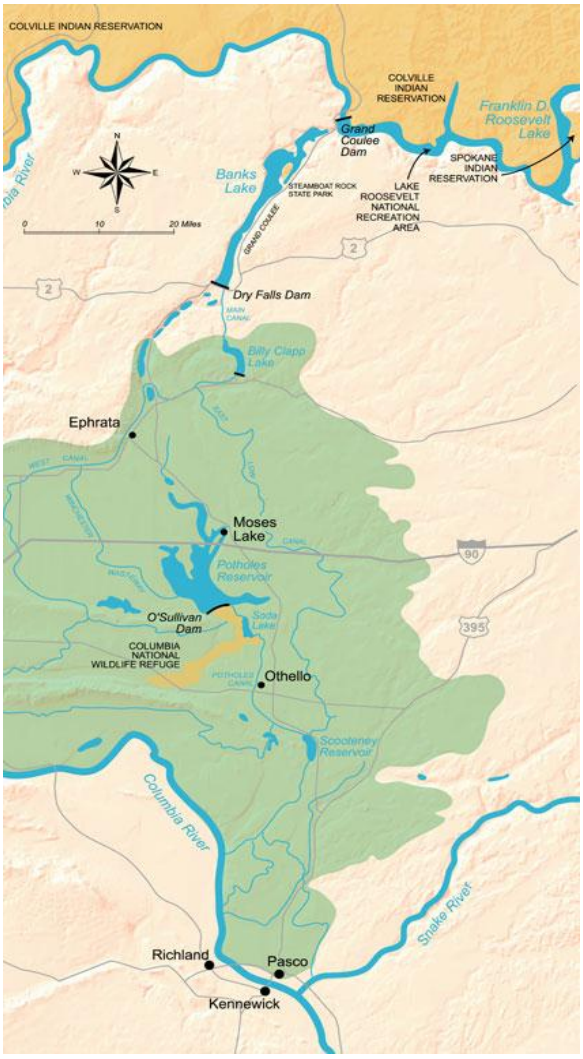
Because of this unpredictability of the future impact of these types of hazards the planning efforts were focused on the "worst case scenario" throughout 100% of the geographical area of Grant County.

Profile of Grant County

Geography

Grant County is a rural county located in the fertile Columbia Basin in the east central part of Washington State. With a geographic area of 2,660 square miles, Grant County is the fourth largest inland area within the state. Grant County is bounded on the west by the Grand Coulee, the Columbia River, and Douglas County; to the south by the Columbia River and Adams and Benton County; to the east by Lincoln and Adams Counties. Rich and fertile valleys, gentle rolling hills, and grassy plains characterize the topography of Grant County.

Columbia Basin Project



The most distinguishing characteristic of Grant County is the extensive network of waterways formed by the Columbia Basin Project.

The Columbia Basin Project is a true multi-purpose project, providing a wide range of benefits to the people of the Columbia Plateau and the Pacific Northwest. One of the main benefits derived from the project is irrigation. Although designed to supply water to more than 1,000,000 acres, the current development is limited to just over 500,000 acres. In 1992, more than 530,000 acres on more than 2,000 farm units received project water with a total crop value of over $552,300,000.

Another primary benefit of the Columbia Basin Project is power. Grand Coulee's 27 generators and 6 pump/generating units produce between 19 and 20 billion kilowatt hours (kWh) each year, making the Grand Coulee Power Complex the largest in North America. Power generated at Grand Coulee is marketed by the Bonneville Power Administration. Revenues from the sale of power generated at Grand Coulee not only help to repay the cost of the power development, but also a portion of the cost of the irrigation development on Columbia Basin Project as well as other Reclamation projects in the Northwest.

The recreational benefits provided by the Columbia

Basin Project are enormous. More than 300,000 acres of land and water are open for recreational activities within the project area.

The Columbia Basin Project is located in the central part of Washington State in the counties of Adams, Douglas, Franklin, Stevens, Okanogan, Grant, Lincoln, and Walla Walla. The primary feature of the project is Grand Coulee Dam, which is located on the main stem of the Columbia River about 90 miles west of Spokane. The project area extends southward from the dam for more than 120 miles to Pasco, Washington, where the Columbia and Snake Rivers meet. Other project features include the Grand Coulee Power Complex and pump-generating plant; Banks Lake and Feeder Canal; the Main, West, East High and East Low Canals; O ' Sullivan Dam and Potholes Reservoir; and Potholes East Canal. Construction of the East High and portions of the East Low Canals has been deferred.

(Source: *U. S. Department of Interior, Bureau of Reclamation* website http://www.usbr.gov/data)

Climate

Grant County is part of the large inland basin between the Cascade and Rocky Mountains. In an easterly and northerly direction, the Rocky Mountains shield the inland basin from the winter season's cold air masses traveling southward across Canada. In a westerly direction, the Cascade Range forms a barrier to the easterly movement of moist and comparatively mild air in winter and cool air in summer. Some of the air from each of these source regions reaches this section of the State and produces a climate which has some of the characteristics of both continental and marine types. Most of the air masses and weather systems crossing eastern Washington are traveling under the influence of the prevailing westerly winds. Infrequently, dry continental air masses enter the inland basin from the north or east. In the summer season this air from over the continent results in low relative humidity and high temperatures, while in winter clear, cold weather prevails. Extremes in both summer and winter temperatures generally occur when the inland basin is under the influence of air from over the continent.

Annual precipitation ranges from 7 to 9 inches near the confluence of the Snake and Columbia Rivers, 15 to 30 inches along the eastern border and 75 to 90 inches near the summit of the Cascade Mountains. During July and August, it is not unusual for four to eight weeks to pass with only a few scattered showers. Thunderstorms can be expected on one to three days each month from April through September. Most thunderstorms in the warmest months occur as isolated cells covering only a few square miles. A few damaging hailstorms are reported each summer. Maximum rainfall intensities to expect in one out of ten years are .6 of an inch in one hour; 1.0 inch in three hours; 1.0 to 1.5 inches in six hours; and 1.2 to 2.0 inches in 12 hours.

During the coldest months, a loss of heat by radiation at night and moist air crossing the Cascades and mixing with the colder air in the inland basin results in cloudiness, and occasional

freezing drizzle. A "chinook" wind which produces a rapid rise in temperature occurs a few times each winter. Frost penetration in the soil depends to some extent on the vegetative cover, snow cover and the duration of low temperatures. In an average winter, frost in the soil can be expected to reach a depth of 10 to 20 inches. During a few of the colder winters with little or no snow cover, frost has reached a depth of 25 to 35 inches.

During most of the year, the prevailing direction of the wind is from the southwest or west. The frequency of northeasterly winds is greatest in the fall and winter. Wind velocities ranging from four to 12 m.p.h. can be expected 60 to 70 percent of the time; 13 to 24 m.p.h., 15 to 24 percent of the time; and 25 m.p.h or higher, one to two percent of the time. The highest wind velocities are from the southwest or west and are frequently associated with rapidly moving weather systems. Extreme wind velocities at 30 feet above the ground can be expected to reach 50 m.p.h. at least once in two years; 60 to 70 m.p.h. once in 50 years and 80 m.p.h. once in 100 years.

Ephrata is the county seat of Grant County and the following *Climate Summary* from the city's weather station is typical of the climate in the area:

EPHRATA, WASHINGTON (452609)

Period of Record Monthly Climate Summary

Period of Record : 1/ 1/1931 to 3/25/1971

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	34.3	42.2	54.1	65.0	74.7	81.9	90.2	88.0	79.3	64.8	46.7	37.3	63.2
Average Min. Temperature (F)	21.2	26.5	33.2	40.5	48.4	55.6	61.6	59.9	52.6	42.1	31.3	25.0	41.5
Average Total Precipitation (in.)	0.98	0.71	0.60	0.62	0.68	0.77	0.22	0.27	0.42	0.64	1.00	1.16	8.04
Average Total Snowfall (in.)	6.1	2.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.8	6.7	17.9
Average Snow Depth (in.)	3	2	0	0	0	0	0	0	0	0	0	1	0

Percent of possible observations for period of record.
Max. Temp.: 95.2% Min. Temp.: 95.2% Precipitation: 95.4% Snowfall: 95.1% Snow Depth: 93.9%

Western Regional Climate Center, wrcc@dri.edu

Economic Profile

Because of the weather, fertile soil, and abundant water provided by the Columbia Basin Project, Grant County is a diversified agricultural production powerhouse in Washington State. One out of every seven dollars of the state's agricultural production comes from Grant County.

Agricultural producers purchase services, fertilizers, seed, farm machinery, and credit within the county and deliver crops and livestock to local processors and marketers, who add considerable value to these crops before shipping them out of the county. In addition to generating income and employment for Grant County, direct and related agricultural economic activity contributes to the county's economic critical mass, making other unrelated businesses viable. For instance, without agricultural shipments, the local transportation sector (e.g., trucking & warehousing, rail transport) would be much smaller. Beyond the local area, agricultural-related traffic on the Snake-Columbia River helps support a viable waterway transport system.

Transportation

Grant County boasts a first-rate multi-model transportation network. The county is bisected by the state's major east-west interstate highway (I90) and has some of the best local roads within the state. It is also bisected by Burlington Northern/Santa Fe Railroad's main east-west line, which connects Chicago and points eastward with Seattle's major seaports and airports. The county is also served by passenger trains, AMTRAK stops in Ephrata.
In addition the county has two former military air bases (Ephrata and Moses lake), now used for commercial aviation. One of these air bases is now Grant County International Airport, operated by the Port of Moses Lake. The airport's main runway is 13,500 feet long, long enough to be used by Japan Airlines and several other air carriers for flight crew training. The U.S. Air Force and the Boeing Company also use the facility for training and testing. Commodities move by truck, rail, and jet aircraft throughout the year. In addition, some commodities are trucked outside the county for further barging on the Columbia-Snake River system to seaports.

Grant County enjoys a balanced transportation system with all modes ensuring the uninterrupted flow of commerce.

(Source: Grant County website http://www.co.grant.wa.us/planning/index.htm from *Economic Profile of Grant County* (Chase Economics & Reed Hansen Associates, September 1999)

Population and Demographics

The Grant County population from 2000 census figures was 74, 698, 13th largest among the states 39 counties. It grew more than 36 percent in the 1990s, much faster than the state as a whole (just over 21 percent). There are just over 28 persons per square mile in Grant County, making it one of the least densely populated. The population is nearly evenly split between cities and unincorporated areas. The total population in Grant County is expected to increase to 106,362 people in 2018 according to the county's Comprehensive Plan.

Moderately priced residential property costs, 300 days of sunshine a year, and some of the most reasonably priced and available electrical rates will continue to attract both industry and people to the area.

As the population continues to grow we must be aware that hazards that too often result in emergencies and/or disasters may affect special populations to a greater degree. These populations face additional risk to the same event. The ability to prepare for and recover from a disaster varies among population groups. Research on various population groups and disasters

found that it took some populations longer to recover from a disaster for a variety of reasons. These population groups include minorities, people with language barriers, the disabled, the elderly, and those with low income.

Ethnic Groups

Minority populations generally experience longer recoveries due to lower incomes, savings and insurance; their difficulty accessing insurance; and their using aid and relief organizations differently than was anticipated. Language and cultural differences can pose difficulties in some populations understanding and implementing preparedness and mitigation actions as well as accessing and using available disaster relief.

Grant County is much more diverse than the state as a whole. The region has a large Hispanic population; a majority works in the fields and orchards, picking and harvesting fruit and vegetables. The growth rate of most minority and Hispanic groups outpaced that of the non-Hispanic white population during the 1990s.

GRANT COUNTY POPULATION BY ETHNIC GROUP

	Hispanic/ Latino	Asian	African American	Native American	Total
Grant	30.1%	0.9%	1.0%	1.2%	33.2%
Washington State	7.5%	5.5%	3.2%	1.6%	17.8%

Source: U.S. Census Bureau, Census 2000.

Diversity shows in the percentage of people who do not speak English as their primary language at home and who speak English less than very well, as shown in Table 4, below.

More than one in four people in Grant County speak a language other than English at home, primarily Spanish. A smaller, but still significant percentage of the people in Grant Counties speak English less than very well. This means that a significant percentage of the population may have a language barrier that prevents them from preparing for a disaster, responding to an event, or applying for assistance after a disaster.

Grant County Primary Language Spoken at Home

	Language Other Than English	***English Less Than Very Well***	**Spanish**	***English Less Than Very Well***	**Other Indo-European**	***English Less Than Very Well***	**Asian-Pacific Islander**	***English Less Than Very Well***
Grant	**28.3%**	**15.7%**	25.2%	14.3%	2.5%	1.2%	0.5%	0.2%

WA State	**14.0%**	**6.4%**	5.8%	2.8%	3.2%	1.3%	4.4%	2.2%

Source: U.S. Census Bureau, Profile of Selected Social Characteristics: 2000

Special Population

Community preparedness activities often do not consider the needs of people with disabilities. They have complex challenges because of hearing, sight, mobility, or mental impairments. Additionally, a significant percentage of working-age people with disabilities do not work. These factors make it difficult for the disabled to prepare in advance of a disaster

The below table shows that one in five people of working age have a disability that does not require them to be institutionalized. About half have jobs. About 40 and 50 percent of retirement-age people in the region have a disability

Grant County Non-Institutionalized Disabled Population

	21 to 64 Years		**65 Years and Older**
	% of Population	**% Employed**	**% of Population**
Grant	21.1%	48.4%	43.3%
Washington State	17.7%	57.6%	42.3%

Source: U.S. Census Bureau, Profile of Selected Social Characteristics: 2000.

Elderly People

Preparedness and recovery activities may overlook the elderly; their age could lead them to have difficulty after a disaster, perhaps not qualify for loans, or become disabled because of the disaster. The table below shows the populations of retirement age people at about the same percentage as the state as a whole.

Grant County Population Over Age 65

	% of Total Population
Grant	11.5%

Washington State	11.2%

Source: U.S. Census Bureau, Census 2000

Poverty

The amount of money people have influences what type of housing they live in, whether they can engage in mitigation actions, and how long it takes to recover. Income is based on a number of factors, including the individual, the economy, availability of jobs, educational opportunity, among others. Expenses can vary by location – rural places are cheaper to live but have fewer jobs, while urban areas can be costly, even for renters.

Table 7, below, shows the greater percentage of people living in poverty than the state as a whole. Contributing to this are agriculture-based economies with abundant part-time, seasonal and low-paying jobs; even the fast growing trade and services sectors in these counties have a preponderance of low-paying jobs.

GRANT COUNTY POVERTY RATES

	% of Total Population	Children Under 18	Over Age 65
Grant	17.4%	22.3%	9.4%
Washington State	*10.6%*	*13.2%*	*7.5%*

Source: U.S. Census Bureau, Profile of Selected Economic Characteristics: 2000.

School Children

The number of children attending school is a concern because many of the school buildings they spend considerable time in each day are older and potentially more vulnerable to the effects of disaster. Table 8, below, shows the population of school-age children, it does not show the number that are in potentially vulnerable buildings.

Grant County School Enrollment – Kindergarten through High School				
	Total	**Kindergarten**	**Elementary**	**High School**
Grant	17,754	1,326	11,042	5,386
Total	**57,051**	**4,025**	**32,406**	**16,782**
Washington State	1,127,448	82,637	697,192	347,619

Source: U.S. Census Bureau, Profile of Selected Social Characteristics: 2000.

Employment and Industry

Agriculture dominates Grant County's economy providing nearly one in four jobs. Production is diverse, ranging from apples and cherries to wheat to potatoes and other vegetables.

In addition, agriculture is the force behind several other industries including food processing, trucking and warehousing, and much of the county's wholesale trade. Taken together, these industries employ more than 40 percent of the county's workers.

Manufacturing has about 20 percent of non-farm jobs in Grant County. The sector has diversified beyond food processing, although production of frozen fruits and vegetables and dehydrated fruits and vegetables remains the largest industry in the sector. Other industries produce farm machinery, publications, fabricated metals, components for computer chips, and navigational instruments.

Government is the second largest economic sector in Grant County, with more than 27 percent of non-farm employment. Nearly five of every six government jobs are in local government, primarily K-12 education, hospitals, and public utilities. This sector provides an element of stability to the economy as well as relatively high-paying jobs.

The trade sector is diverse, accounting for one of every four non-farm jobs. Farm and garden machinery account for the most jobs in wholesale durable goods. In nondurable goods, wholesale trading of farm supplies and fruits and vegetables provide the most employment. Retail trade has greater employment, particularly in eating and drinking places and grocery stores, than wholesale trade.

Summary

Grant County should continue to draw people and industry to the area because of numerous amenities such as; cheap power, affordable land, abundant sunshine, recreational and agricultural opportunities provided by the Columbia Basin Project, and finally a first-rate multi-modal transportation network both people and product.

Any hazard analysis must anticipate the Grant County population and economic base will continue to grow and change. It should also anticipate the challenges of diversity and demographics. As a living document the Multi-jurisdictional Hazard Mitigation Plan for Grant County must continue to evolve to meet changes that surely will occur.

Civil Disturbance

DEFINITIONS:
Civil disturbance – Any incident that disrupts a community where intervention is required to maintain public safety constitutes a civil disturbance. Some examples are demonstrations, riots, strikes, public nuisances, and criminal activities.[1]

BACKGROUND INFORMATION:
Civil disturbance incidences may include resistance or rejection of all different types of control and authority. They tend to occur in areas of concentrated populations including sporting, concert, cultural and conference events. Some areas subject to civil disturbances may include college communities, areas with concentrations of disparate economic status populations and government offices.[1] Some examples of criminal activities associated with civil disturbances may include looting, assault, property or environmental damage, illegal drug use or distribution, fire-setting, vandalism and violation of noise ordinances.

HISTORY:
Mattawa: Unemployment Office
During the summer of 2000, a farm labor organization took over the unemployment office in Mattawa and refused to leave for a few days. The workers in the City Hall building were scared and it was closed during regular work hours on the first day of the incident.[3]

The Gorge Amphitheatre
Some recurring criminal themes for the concert event season of 2005 were trespassing, drug-related charges and domestic violence.[2] No rioting incidences occurred during this season. The Gorge Amphitheatre has a capacity for 22,000 people per concert. There is a campground adjoining the amphitheatre on an adjacent irrigated circle. During peak campground attendance approximately half of the concert attendance camps at the campground. Back to back concerts over three day weekends will generate 20,000-30,000 people camping at the campground. The nature of the particular concert largely determines how large of a partying attitude is present in the campground. The campground becomes the largest city in the County. The Gorge schedules 14-25 concerts a season between May and September. There have been incidents in the past at the campground when crowds assaulted deputies with thrown objects and crowds attempted to roll emergency vehicles over. Vehicles have been vandalized. A one-ton bale of hay has been stolen and lit on fire within the campground. Additional security and law enforcement has been scheduled in planning to address these types of issues. The Sheriff's Office draws on other local agencies and neighboring counties when the department does not have enough manpower. The incident when a one ton bale of hay was lit on fire had the added element that the crowd would

[1] Washington State Hazard Identification and Vulnerability Assessment, 2001

[2] Grant County Sheriff's Office, George Detail Report Summaries, 2002-2005

not let fire suppression to it. That incident resulted in a Sheriff's Office wide call out and early closure of the campground. All campers were required to leave and damage was limited to the hay bale.

Incidents have occurred in past years where a suspect or two went around the campground assaulting people by hitting them over the head with a metal flashlight. In one night, more than 13 victims sought medical care from this type of assault. Concert goers suffering from overdose of alcohol and drugs substantially impact local hospitals and ambulance services.[3]

Disruptive Labor Disputes

On almost a yearly basis, the Grant County Sheriff's Department gets called to respond to labor disputes. They typically involve between 20 - 300 farm workers who may be trying to influence their employer. Physical assaults and threats are reported during these incidents. Typically victims of these assaults do not come forth. Some years, there may be several of these types of incidents during harvest season.[3]

Moses Lake Sand Dunes and other recreational destinations within Grant County

These areas are host to many recreational visitors from around the state during spring, summer and fall. Large concentrated groups of people consuming alcohol results in physical fights and injuries. This disrupts other campers and expends law enforcement resources in the process.[3]

HAZARD IDENTIFICATION:

Grant County has two college campuses and several government buildings within its boundaries. In the warmer months, the Gorge Amphitheatre is host for many concert events which draws thousands of people together at its concert and campground areas. The Sand Dunes near Moses Lake draws in large crowds of people during the warmer months for its close proximity to water and rolling, sand covered hills keeping the interest of boaters, fishers, campers and off-road vehicle driving. Many jurisdictions have annual town celebrations that bring people into concentrated areas. Grant County also hosts an annual fair which lasts for five days each summer and includes vendors, exhibits, rides and entertainment.

A large-scale civil disturbance at the Gorge Amphitheatre may be a reality in the future. Security plans and response procedures have been established for the Gorge. The nature of the gatherings at the Gorge continue to provide an atmosphere where riots or civil disobedience are likely to occur.

VULNERABILITY ASSESSMENT:

Injury and damage to people and property at these types of incidents will be the victims. Large numbers of these people may not have been part of the problem. Protection of these innocent parties falls to emergency response including law enforcement, fire suppression and emergency medical services. The potential for having to deal with these incidents impacts the ability of local emergency responders to provide service to the year-round local residents of Grant County.

---

[3] Melvin, Jon., 2006 Grant County Sheriff's Department

PROBABILITY AND RISK:
Grant County does not host global meetings nor does it have a state university. The major sports teams are located in Seattle. There are, however, many activities which bring in tourists and vacationers to the area each year. There is a **MODERATE PROBABILITY** and a **MODERATE RISK** concerning civil disturbances in Grant County. This hazard is more of a risk to certain parts of the county than others and to apply the hazard to the county as a whole may be disproportionate.

CONCLUSION:
While civil disturbance episodes are unlikely to respond to authority, they are not likely to occur as a large-scale incident in Grant County with the exception of a few locations. However, if an incident does occur, it can quickly and easily escalate, adversely affecting people, property and possibly the environment. Because of the scope of the scenario in a civil disturbance, it may create staffing shortages in response agencies therefore reducing their ability to respond to other matters. Hospital emergency rooms are substantially impacted when responding to injuries related to events at the Gorge Amphitheatre.

REFERENCES:

Grant County Sheriff's Department, 2002 – 2005., Gorge Detail Report Summaries; all.

Melvin, John. Grant County Sheriff's Department, 2006., Written Synopsis; all.

Washington State Military Department, Emergency Management Division., 2001, Washington State 2001 Hazard Identification and Vulnerability Assessment.

Drought

DEFINITIONS:
Drought – an extended period of abnormally low precipitation; a condition of climate dryness that is severe enough to reduce soil moisture as well as water and snow levels below the minimum necessary for sustaining plant, animal, and economic systems.

BACKGROUND INFORMATION:
While drought originates from a deficiency of precipitation over an extended period of time, usually a season or more; drought is also related to the timing and the intensity or number of rainfall events. Other climactic factors such as high temperature, high wind, and low relative humidity are associated with drought in many regions of the world and can significantly aggravate the severity of a drought. Drought differs from aridity, a permanent climactic feature common to regions with low rainfall.

In 1989, the Washington State Legislature gave permanent drought relief authority to the Department of Ecology and enabled them to issue orders declaring drought emergencies. (RCW 43.83B.400-430 and Chapter 173-166 WAC) In Washington State, the statutory criteria for drought is a water supply below 75% of normal and a shortage expected to create undue hardship for some water users.

HISTORY:
Even in the Evergreen State, droughts are a natural part of the climate cycle. In the last century, there have been a number of drought episodes, including several that have lasted for more than a single season, such as the dry periods between 1928-1932 and 1992-1994. Severe drought episodes occurred in 1977 and 2001. The 1977 event set records for low precipitation, snow-pack, and stream flow totals that still stand today. The 2001 event was the second-worst drought year in state recorded history.

Washington State usually experiences drought during a regional climate event characterized by a period of below-normal precipitation. While Grant County has experienced some periods of drought in the past, these events are typically low to moderate in severity and relatively short in duration. The agricultural industry usually experiences the greatest impact from a drought event in Grant County.

Rainfall for eastern Washington during the 2001 water year was approximately 30% below normal. On March 14, 2001, after several months of record low precipitation, Governor Gary Locke authorized the Department of Ecology (Ecology) to declare a statewide drought emergency. Washington was the first Northwest state to make a drought declaration. Due to above-average precipitation in the final two months of the year, the drought emergency formally expired on December 31, 2001. The National Weather Service reported that the winter of 2000-01 was the driest since 1976-1977. It was also one of the five driest in the past 100 years.

Washington State Drought Occurrences

(Information obtained from Washington State Military Department, Emergency Management Division)

Date	**Occurrence**
July-August 1921	Drought in all agricultural sections.
June-August 1922	The statewide precipitation averaged .10 inches.
March-August 1924	Lack of soil moisture retarded germination of spring wheat.
July 1925	Drought occurred in Washington.
July 21-Aug 25, 1926	Little or no rainfall was reported.
June 1928-March 1929	Most stations averaged less than 20 percent of normal rainfall for August and September and less than 60 percent for nine months.
July-August 1930	Drought affected the entire state. Most weather stations averaged 10 percent or less of normal precipitation.
April 1934-March 1937	The longest drought in the region's history – the driest periods were April-August 1934, September-December 1935, and July-January 1936-1937.
1944	Water shortages in Spokane.
Spring, 1966	The entire state was dry.
June-August 1967	Drought occurred in Washington.
January-August 1973	Dry in the Cascades.
October 1976 - September 1977	Below normal precipitation in Olympia, Seattle, and Yakima. Crop yields were below normal and ski resorts closed for much of the 1976-77 ski season.
October 1991 – September 1994	Water supply in Yakima River Basin was 65 percent of normal.
2000 - 2001	Governor Gary Locke authorized the Department of Ecology (Ecology) to declare a statewide drought emergency. National Weather Service reported that the winter of 2000-01 was the driest since 1976-1977. It was also one of the five driest in the past 100 years.

HAZARD IDENTIFICATION:

When a drought begins, the agricultural sector that depends heavily on water that is stored in the soil, such as dry land wheat farmers, are usually the first sector to experience the effects of a drought. Soil water can be rapidly depleted during extended dry periods. If precipitation deficiencies continue, then people dependent on other sources of water will begin to feel the effects of the shortage. Those who rely on surface water (reservoirs and lakes) and subsurface water (ground water), for example, are usually the last to be affected. A short-term drought that persists for 3 to 6 months may have little impact on these sectors, depending on the characteristics of the hydrologic system and water use requirements.

When precipitation returns to normal and meteorological drought conditions have abated, the sequence is repeated for the recovery of surface and subsurface water supplies. Soil water reserves are replenished first, followed by stream-flow, reservoirs and lakes, and ground water. Drought impacts may diminish rapidly in the agricultural sector because of its reliance on soil water, but linger for months or even years in other sectors dependent on stored surface or

subsurface supplies. Ground water users, often the last to be affected by drought during its onset, may be last to experience a return to normal water levels. The length of the recovery period is a function of the intensity of the drought, its duration, and the quantity of precipitation received as the episode terminates.

The following list is a compilation of comments and suggestions made by various stakeholders and the public regarding possible problems that could result from a drought.

In addition to a possible shortage of water in some areas of the county as well as likely damage to agricultural crops, a drought in Grant County could potentially result in the following:

- Inadequate river flow volumes to support fish.
- Long-term burn bans throughout the county.
- An increase in the potential risk of wildland fires, wildland-urban interface fires, and cropland fires from a variety of natural and human-caused sources including the discharge of fireworks.
- Increased energy and food costs.

VULNERABILITY ASSESSMENT:

The agricultural industry is the most vulnerable to the impacts of a drought event in Grant County. The agricultural industry relies on a consistent and ample water supply. Annual crops may be damaged or lost in a single growing season but usually rebound with normal precipitation amounts the following year. Farmers and orchardists that use irrigation water from the Columbia Basin irrigation project are less susceptible to the early affects of a short-term drought. However, they may start to experience drought affects if the dry period extends much past six months. In order to make up for water shortages, some farmers, orchardists, and even municipal water systems have backup wells or have the ability to pump water directly from the Columbia River or through irrigation canals.

A severe drought may result in a moderate number of wells going dry. The potable water supply for much of Grant County cities comes from municipal water systems. Moses Lake, for example, has a number of deep wells that have been driven through the basalt to depths of more than one thousand feet. These deep wells are replenished by the Columbia River and less susceptible to drought. The remaining people in Grant County receive their potable water from private or community wells that tend to be shallower and are replenished by runoff. They are more susceptible to drought, although because of the large geographical area supplied with irrigation water from the Columbia Basin project this is less so than other areas of Eastern Washington with less irrigated farm land, canals and waterways. The effects of an extreme, long-term drought could result in less aquifer discharge thereby resulting in the implementation of strict water conservation measures for those dependent on wells. This is something that the majority of the population of Grant County is not familiar with.

A drought lasting for more than one season would most likely reduce the annual snow-pack normally accumulated in the Canadian mountains thereby reducing normal river flows in the Columbia River and hence the Columbia Basin Irrigation Project footprint. A substantial reduction in river flow could severely impact the generation of electricity from the hydro-electric

dams located on the Columbia River. A reduction in hydro-electric generation would likely result in increased electricity rates for all residents, farms, and businesses in the area. In addition to the elevated electricity rates, reduced hydro-electric power generation will result in increased non-hydro power generation which will drive the price of diesel and natural gas sharply upward. The higher energy prices mean higher costs for transport of farm product, increased costs for processing and storage as well as higher fertilizer prices. Besides the higher costs for agriculture, we can expect a higher number of job losses, too.

According to the Washington State Hazard Identification and Vulnerability Assessment (HIVA), three energy curtailments during drought periods prior to 1977 caused temporary increase in the unemployment rate. Due to a drastic increase in electricity rates in 2001, several large manufacturing plants in some Washington counties closed their businesses and laid off many employees. A severe, long-term drought would no doubt have the same effect on large business and industry that rely on large amounts of electrical power and/or water to operate.

A severe drought could cause reduced river flows thereby creating a major impact on local salmon runs due to potentially warmer waters and low water levels. Recreational use of the lakes and rivers in Grant County would suffer as well. In addition, rural settlements and residential areas bordering wildland could be at risk from wildfires ignited by lightening or intentional human actions.

According to the Washington State Hazard Mitigation Plan – Drought Hazard profile (March 2004, draft #3), Grant County is one of the ten counties most at-risk and vulnerable to drought. This rating was based on the history of drought in our county, the demand for water resources (agricultural and potable), and an inability to endure the economic challenges associated with a drought. Currently the county has the most land under irrigation in the State of Washington at about 500,000 acres, and is second (14th nationally) in market value for all crops irrigated and not, yet it is defined in 2003 as "economically distressed" (because its unemployment rate was 20 percent greater than the state average from January 2000 through December 2002).

This same document estimates from 1895 to 1995 Grant County has endured "serious or extreme" drought approximately 10-15% of the time.

PROBABILITY and RISK:

Based on historical evidence, there is a **HIGH PROBABILITY** of a drought occurring in Grant County but a **MODERATE RISK** associated with such an event due to the typical duration of the historical droughts and the susceptibility of the agricultural community to the direct and indirect effects of a drought in Grant County.

CONCLUSION:

Rainfall amounts are fairly consistent within Grant County. According to the Western Regional Climate Center, reporting stations document precipitation at fairly consistent amounts. In north Grant County, Coulee Dam receives an average annual precipitation of 10.58 inches; Ephrata, which is the north central area, receives 7.61 inches; Moses Lake, which is the center, receives

8.01 inches; Quincy, which is in northwestern Grant county receives 7.89 inches, and finally Smyrna, in the extreme south area receives 7.93 inches a year. The majority of annual precipitation occurs during November through March with the months of June through September being the driest. Grant County potable water supplies, for the most part, are relatively resistant to short-term drought episodes.

Should a severe, long-term drought occur, it will be vital that local elected officials and governmental agencies work cooperatively with the Washington State Department of Health, the Washington State Department of Agriculture and the Washington State Department of Ecology to help insure efforts are make to protect public water supplies, aid agriculture and local industry, and safeguard fish and river flows.

Earthquake

DEFINITIONS:
Earthquake – A sudden slip on a fault and the resulting ground shaking and radiated seismic energy caused by the slip; or by volcanic or magmatic activity; or other sudden stress changes in the earth.

Epicenter – The point on the earth's surface vertically above the focus, the point in the crust where a seismic rupture begins.

Focus – The point within the earth where an earthquake rupture starts.

Liquefaction – A process by which water-saturated sediment temporarily loses strength and acts like quicksand.

Seiche – The sloshing action of an enclosed body or partially enclosed body of water from earthquake shaking.

BACKGROUND INFORMATION:
Washington ranks second in the nation (after California) among states susceptible to earthquake loss according to a Federal Emergency Management Agency (FEMA) study. More than 1,000 earthquakes are recorded in the state annually, the vast majority of these occurring west of the Cascade Mountains. Most of these earthquakes are so small that only very sensitive instruments can detect them – a small number of these earthquakes cause shaking and occasional damage. Depending upon the magnitude and depth of an earthquake, the effects of an earthquake can be felt over large geographical areas. Large oceanic and continental tectonic plates move over the surface of the earth at a rate of a few centimeters each year. Where these plates collide stresses build up eventually releasing energy as earthquakes.

HISTORY:
Eastern Washington has experienced damaging earthquakes in the past, however, very few are large enough to cause ground shaking and property damage. Since 1872, there have only been two significant earthquakes (magnitude 5); the Lake Chelan (magnitude 7.2) in 1872 and the Stateline (magnitude 6.1) earthquake near Walla Walla in 1936. Geologists have discovered evidence that large earthquakes have occurred repeatedly in the past. The interval between these large earthquakes is estimated to range from hundreds to thousands of years.[1]

In 1918, the Corfu earthquake caused ground shaking. It is estimated that this earthquake was a magnitude 4.4 and several aftershock quakes were felt after the main incident. The Corfu area is located among the Saddle Mountains in the Southeast region of Grant County. However, since 1997, there have been 19 notable (greater than magnitude 3) earthquakes in eastern Washington.

[1] Washington Public Power Supply System, 1981.

HAZARD IDENTIFICATION:
In recent years, scientists have greatly expanded their knowledge concerning the seismic vulnerability of the Pacific Northwest region. Seismologists have identified three distinct sources of earthquakes.

Shallow (crustal zone) earthquakes that occur along near surface faults and fractures within the Earth's crust at depths less than 30 Kilometers. These are the type of earthquake that eastern Washington would experience. Shallow earthquakes with magnitudes of up to 7 on the Richter scale can happen anywhere in southeastern Washington. Fortunately, great crustal earthquakes are quite rare and occur perhaps only once every 1,000 years. **Deep (intraplate) earthquakes** that occur from faulting in the subducting (Juan de Fuca) plate, usually at depths between 50 and 70 kilometers of the Earth's surface. Deep or intraplate earthquakes with magnitudes ranging from 6 to 7 (or greater) on the Richter scale are of concern in western Washington. **Subduction (Subduction Zone) earthquakes** are caused by the release of the friction and stresses generated as two converging tectonic plates slide past one another. The world's greatest earthquakes are observed at subduction zone boundaries. Subduction earthquakes have the potential of being large quakes (with magnitudes exceeding 8 on the Richter scale) that may affect a large geographical area and may be accompanied by tsunamis and large aftershocks. Subduction zone earthquakes are a major concern to the greater Puget Sound region but not to eastern Washington.

Earthquakes cause damage primarily by strong ground shaking and secondarily from the effects of ground failures as well as tsunamis and seiches. One of the largest seiches ever experienced in Washington happened upstream of Grand Coulee Dam in the Roosevelt Reservoir on the Columbia River (Weaver, 2004.) A large landslide fell into the Columbia River and generated a fifty-foot wave. Ground failures caused by earthquakes include fault rupture, ground cracking, slumps, landslides, rock falls, liquefaction, uplift and subsidence.

As a rule, the severity of ground shaking generally decreases with distance from the earthquake source. Given an earthquake of a certain magnitude, the severity of ground shaking will generally lessen the farther you are located from the epicenter of the earthquake or the deeper the earthquake occurs. Also, the type of soil in the affected area is another factor in how damaging an earthquake will be. Structures sitting on stiff rock are less likely to receive damage than structures sitting on sandy soils. The National Earthquake Hazard Reduction program (NEHRP) has developed a soil classification system that is used to help determine damage susceptibility based upon how the particular soil reacts to shear wave velocities experienced during an earthquake.

VULNERABILITY ASSESSMENT:
Recent studies suggest that the entire State of Washington is at risk to earthquakes. The Nisqually Quake of 2001 with the epicenter near Olympia, Washington could be felt as far east as Spokane and as far south as Utah. Also in the Spokane area, a different type of earthquake has been identified. In 2001, the area experienced what scientists are now calling earthquake booms that can be heard by humans. Of the booms that have occurred, ground shaking has not been reported, suggesting this type of earthquake may never be detected or measured on the

Richter scale as the waves travel as scalar waves, unlike traditional electromagnetic or radio waves.

Grant County has experienced earthquakes in the past, but has not sustained widespread damage. The Nisqually Quake was felt in Grant County in different areas but there was a lack of damage reporting until it was too late to obtain financial assistance from the appropriate resources. Two well sites in Ephrata were damaged. It was discovered that the down draft tubes were broken and recovery and replacement of broken parts were estimated at twenty thousand dollars or more for each well. One well in Soap Lake was damaged when it collapsed at 304 under ground. The well was normally 450 feet deep. Due to a lack of public education, the damages were not reported in time for the claims to be included and Grant County was not accepted as a declared county in the State of Washington for this event. Although the public was advised to contact the Federal Emergency Management Agency, the county, or the Disaster Field Office in Olympia, Washington, no reply was received.[2]

Areas susceptible to liquefaction are a concern because this process can include catastrophic consequences. It can rupture pipelines and pull apart building foundations and walls, and can cause damage to roadways, bridges and railroads. Crab Creek, which bisects the southern portion of Grant County is a high risk area for this type of situation. Other areas having a high risk are: Soap Lake, Wilson Creek, Ephrata, the Rocky Coulee and the Lind Coulee Wasteways, and partially along Highway 2, northeast of the town of Coulee City. Areas of moderate risk are Quincy, George and the Frenchman Hills. Land use planners can mitigate the risk through zoning.

PROBABILITY AND RISK:
There is a **LOW PROBABILITY** and a **MODERATE RISK** associated with earthquakes in Grant County. Major earthquakes in the region occur in hundreds to thousands of years and the amount of bedrock areas in Grant County may reduce the severity of damages sustained. Land use planners may be able to mitigate the risk through zoning.

CONCLUSION:
While large earthquakes are not a frequent occurrence within Grant County, earthquakes in surrounding counties have been felt and have produced damage here. Scientists have discovered more recent earthquakes in the eastern portion of the State of Washington, having level 3 magnitude or higher on the Richter scale. There is no way to accurately predict earthquakes, but we can learn from the past and prepare for the future. Land use planners can help to mitigate earthquake risks in Grant County by implementing zoning areas for specific land uses.

[2] Grant County Dept. of Emergency Management., 2001 Nisqually Earthquake Records.

REFERENCES:

Grant County Department of Emergency Management., 2001, Nisqually Earthquake Records: Measuring Earthquake and Drought Effects.

Washington Public Power Supply System., 1981, "WPPSS Nuclear Project No. 2, Final Safety Analysis Report, Volume 1, Amendment 18.

Fire

DEFINITIONS:
Urban Fire – a fire of accidental or intentional origin that results in the uncontrolled destruction of homes, businesses, and other structures in rural, urban or suburban areas.

Wildland Fire – a fire of natural or human-caused origin that results in the uncontrolled destruction of forests, field crops and grasslands.

Wildland-Urban Interface Fire – a fire of natural or human-caused origin that occurs in or near forest or grassland areas where isolated homes, subdivisions, and small communities are also located.

NOTE: *This section consolidates the assessments for Urban Fire and Wildland Fire.*

BACKGROUND INFORMATION:
Grant County experiences three types of fire threats: structure fires, wildland fires, and wildland-urban interface fires. Structure fires do not typically pose a great threat to the community except when the fire spreads to other nearby structures and quickly expands to a size that could threaten large numbers of people and overwhelm local fire resources. Wildland fires are a natural part of the ecosystem in Washington State. However, wildfires can present a substantial hazard to resources, life and property. Statistics show that on an annual basis, an average of 905 wildland fires burn 6,488 acres resulting in a resource loss of $2,103,884 in Washington State. Most wildland fires are started by human causes including discarded smoking materials like cigarettes, the discharge of fireworks, outdoor burning and deliberate acts of arson. Many of these fires are usually extinguished in their initial stages being less than one acre in area. Depending upon weather, topography, fuels accumulation and other factors, wildland fires can spread rapidly to hundreds or thousands of acres and may require hundreds of firefighters working several weeks to extinguish.

One challenge Grant County faces regarding the wildland hazard is from the increasing number of homes being built in the urban/rural fringe (known as the wildland-urban interface.) Due to a growing population and the desire of some persons to live in rural or isolated areas or on hillsides with scenic views, development continues to expand further and further into traditional open space lands. Wildland fires occur primarily in undeveloped areas; these natural lands contain dense vegetation such as grasslands or agricultural croplands. Because of their distance from firefighting resources and personnel, these fires can be difficult to contain and can cause a great deal of destruction. Lightning and human carelessness are the primary causes of wildland fires. Fortunately, due to the availability of fire protection capabilities and our irrigated landscape, large-scale wildland fires are rare in Grant County. The potential exists for individual fires to spread and merge together to form a firestorm covering vast amounts of area. The involved area becomes so hot that all combustible materials ignite, even if they are not exposed directly to flames. As the fire becomes larger, it has the capacity to create its own local weather as superheated air and hot combustion gases rise upward over the fire zone, drawing surface winds from all sides, often at velocities approaching 50 miles per hour. In exceptionally large

events, the rising column of heated air and combustion gases carries enough soot and particulate matter into the upper atmosphere to create a locally intense thunderstorm thereby increasing the possibility of additional lightning strikes.

HISTORY:
Grant County has been fortunate in that it has not experienced any large-scale fires which have caused death, injury and loss to community infrastructure, businesses and homes. Grant County typically has wild land fires annually including the burning of great abundances of dry vegetation. During wet winters and springs, the growth of wild vegetation greatly enhances wild land fire risks when the vegetation dries out. Many wild land fires which have occurred destroyed thousands of acres of land. Some of these fires have involved crops of wheat, barley and field corn. The Fire Mobilization Plan of Grant County has been activated several times in an effort to gain control of these fires. For more information on this plan, please refer to the Summary of Comprehensive Plans in Chapter 1.

July 14, 1987 Sun Lakes State Park Fire
This wild land fire consumed 24,000 acres within a 38 square mile area threatening the Town of Coulee City. Grant County Fire Protection District #7 and Coulee City Fire Department requested mutual aid from seven neighboring jurisdictions to fight the flames driven by 20 m.p.h. wind gusts. The estimated loss in equipment owned by the fire departments, fencing, grazing lands and personnel costs totaled $296,500.00.

August 2-3, 1996 Baird Springs Fire
This wild land fire spread over 14,000 acres and required the declaration of State Fire Resource Mobilization assistance. The fire required aerial fire-fighting strategy including four United States Forest Service aircraft and two Department of Natural Resources helicopters. The American Red Cross supported fire-fighting personnel by providing meals.

HAZARD IDENTIFICATION:
Unlike other disaster events, the direct effects of even a large fire are generally limited to the immediate area where the fire occurred. However, the community's normal as well as emergency services may be affected as large numbers of agencies and individual responders focus their efforts on the fire. Adjacent fire agencies may be asked for assistance in one form or another and access to a city's business district may be restricted or closed and the influx of sightseers and media personnel can further add to the disruption. Furthermore, since most fire fighters in Grant County are volunteers, large fire events could significantly affect not only their lives but their source of employment should economic impacts continue.

Evacuation of a fire zone is one of the first tasks that may need to be undertaken by emergency responders. Depending upon the size of the fire zone, the population density of the area, and the number of persons needing emergency shelter, evacuation efforts may have a significant effect on other parts of the community. The fire season in Grant County can begin as early as mid-April and continue through October though unusually dry periods can extend the fire season. The possibility of a wildland fire depends on fuel availability, topography, the time of year, weather, and activities such as debris burning, land clearing, camping, and recreation. In Washington State, wildland fires start most often in lawns, fields or other open areas, and along transportation

routes. Due to their size and complexity, large fires can put a tremendous strain on a wide variety of agencies and jurisdictions within the area that the fire occurs and local resources could be quickly overwhelmed in dealing with the impacts of a large fire.

Those persons living or doing business in the area of a large fire could be affected in several ways. Access to the area will probably be controlled or entry may be denied entirely. If a recreational area is involved, this closure may have a severe impact on tourist industry business. In many cases, evacuations may be necessary if the fire directly threatens residential or commercial areas or in the event health issues could result from heavy volumes of smoke associated with large fires.

The following list is a compilation of comments and suggestions made by various stakeholders and the public regarding possible problems that could result from a wildland or wildland-urban interface fire.

In addition to damaging agricultural crops, homes, businesses, property, and the environment, a wildland or wildland-urban interface fire in Grant County could potentially result in the following:

- A significant area in unincorporated Grant County is particularly vulnerable to wild land fires since there is little fire service in some of the outlying areas. Property owners should take appropriate steps to ensure that their property/structures contain a buffer around them to ensure adequate defensible space. The FIREWISE Program can help property owners address this problem.

- All wild land urban interface areas and properties on the edge of the incorporated cities are susceptible to wildland or wildland-urban interface fires caused by fireworks and/or human recklessness.

VULNERABILITY ASSESSMENT:

Those persons living in interface areas are most vulnerable to wildland or wildland-urban interface fires. Within Grant County the vast majority of the land area is used for agricultural purposes. All of these areas are vulnerable to wild land or wild land-urban interface fires. The potential for large wildland fires in Grant County can be termed as moderate. Risk assessments should be accomplished by the use of the national standard NFPA-299 for standardization of the risk potential. Irrigated farmlands, improved fire spotting techniques, better equipment, and trained personnel are major factors in the fairly small number of wildland fires that have occurred in the county. Most of the land areas of Grant County receive about 8-10 inches of rainfall annually. This dry climate and the frequent occurrence of strong, dry winds can cause natural fire fuels to reach a combustible state. Additionally, high summer temperatures coupled with seasonal low rainfall amounts sometimes lead to summer drought conditions in the agricultural industry. These conditions are reached more often than most people realize. Luckily, there has been a lack of ignition during times of serious fire danger in Grant County. However, the absence of large fires coupled with reduced burning has also resulted in greater fuel loading which could lead to a catastrophic fire given the right set of conditions.

Should a wildland fire or wildland-urban interface fire occur, the impacts of the fire would vary greatly with the size and location of the fire, the weather, and time of year. It is unlikely that a major wildland or wildland- urban interface fire would seriously impact Grant County as a whole.

In the event of a large wildland or wildland-urban interface fire, additional resources could be requested through activation of the Washington State Fire Mobilization Plan in addition to other state and federal fire resources.

While there have always been a certain number of people that have built homes in open areas, in recent years, the numbers of people choosing to build in or very near wildland areas has increased significantly as city limits have expanded into previously unpopulated and agricultural areas. As the population of Grant County increases and peoples desire to live in more rural or isolated areas, development in the wildland-urban interface will continue to expand thereby increasing the potential risk to lives and property from wildland and wildland urban-interface fires.

Should a large wildland or wildland-urban interface fire occur in Grant County, the effects of such an event would not be limited to just the loss of valuable rangeland, wildlife habitat, and recreational areas. The loss of large amounts of vegetation on steep slopes of watersheds would increase the risk of landslides and mudslides during the winter months and the depositing of large amounts of mud and debris in streams, rivers, and irrigation channels could threaten valuable fish habitat and watershed usage for many years. In addition, the loss of crops and grazing land could significantly impact the agricultural industry in Grant County for a few years or more.

If a significant portion of the business area has been affected, the loss to the community can be overwhelming. Reduction of payrolls, infrastructure and long-term layoffs during recovery from a large fire could have a serious impact on the buying power of a large sector of the population. A long-term business closure could also have a large impact to the community's tax base.

The assessment of fuel hazard deals with identifying areas of like fire behavior based on fuel and topography. Protection capability assessment involves estimating the actual response times for initial attack forces and how complex the actual suppression action may be once they arrive because of access, fuel profile, existence of natural or human-made barriers to fire spread, presence of structures and predicted fire behavior. Ignition risks are those human activities or natural events which have the potential to result in an ignition. Fire history looks at the fire locations, cause, number of acres burned annually, and the average annual number of fires by cause. Catastrophic fire potential is an evaluation of fire history that reflects the potential for an event to occur. A value assessment looks at the natural or developed areas where loss or destruction by fire would be unacceptable.

PROBABILITY and RISK:

Based on historical evidence, there is a **MODERATE PROBABILITY** of a large wildland or wildland-urban interface fire occurring in Grant County and a **MODERATE RISK** to people and property as a result of a large wildland or wildland-urban interface fire.

CONCLUSION:
Grant County's dry climate and vast grassland areas make it a potential tinderbox for a major fire. While wildland and wildland urban-interface fires do occur in Grant County on a fairly regular basis during the warm summer months, these fires are typically very small and are usually extinguished with existing personnel and equipment.

The vast majority of the land in Grant County is comprised of agricultural land that is vulnerable to wildland or wildland urban-interface fires. Much of the agricultural lands are serviced by volunteer fire protection districts. Building homes or other structures in areas without adequate fire protection increases the risk of loss from fires. In the past, structures were often built with minimal awareness regarding the risks associated with wildland or wildland urban-interface fires.

Flood

DEFINITIONS:
Flood – An inundation of dry land with water caused by weather phenomena and events that deliver more precipitation to a drainage basin than can be readily adsorbed or stored within the basin.

Flood Watch – Issued by the National Weather Service when the probability of a hazardous flooding event has increased significantly but its occurrence, location, or timing is still uncertain. The public can set their plans in motion to prepare for the event. A Flood Watch is issued from 12 to 36 hours before the occurrence of the event.

Flood Warning – Issued by the National Weather Service when a hazardous flooding event is occurring, is imminent, or has a high probability of occurrence within 12 hours. A Flood Warning is issued for conditions posing a threat to life and/or property.

Flood Stage – A height at which a watercourse overtops its banks and begins to cause damage to any portion of the river valley.

Floodplain – The land area of a river valley that becomes inundated with water during a flood.

Floodway – That portion of the natural floodplain that is regularly inundated during the normal annual flood cycles of a river or stream. For most waterways, the floodway is where the water is likely to be deepest and fastest. It is the area of the floodplain that should be kept free of obstructions to allow floodwaters to move downstream.

100-Year Floodplain – That portion of the floodplain that would be inundated by water during a 100-Year Flood event.

500-Year Floodplain – that portion of the floodplain that would be inundated by water during a 500-Year Flood event.

National Flood Insurance Program (NFIP) – A Federal program enabling property owners in participating communities to purchase insurance protection against losses from flooding. This insurance is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods. Participation in the NFIP is based on an agreement between local communities and the Federal Government which states if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas, the Federal Government will make flood insurance available within the community as a financial protection against flood losses.

Community Rating System (CRS) – A voluntary program within the NFIP that encourages and recognizes community floodplain management activities that exceed the minimum NFIP standards for local mitigation, outreach, and education. Under the CRS, flood insurance rates are

adjusted to reflect the reduced flood risk resulting from community activities that reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance.

BACKGROUND INFORMATION:
Flooding occurs on rivers and streams when excessive water discharge causes river or stream channels to overflow. The Columbia River and Crab Creek are all susceptible to flooding.

The threat of flooding in Grant County is greatest in the months of December through February although flood events may occur during other months of the year. Winter flood events have the potential to produce the highest peak flows when significant snowfall is present, followed by rapidly rising temperature and/or heavy rain. In addition, increased flow rates from the hydroelectric dams further increase the potential of flooding due to their effect on river discharge flows. The Columbia River is the second largest river system in the United States behind the Mississippi River. From its source in Canada, the Columbia River flows 1,243 miles and empties into the Pacific Ocean at Astoria, Oregon. The river drains an area of approximately 250,000 square miles.

Crab Creek traverses the length of Grant County, from the far northeast corner through the communities of Wilson Creek, Moses Lake, then it parallels the Saddle Mountains finally dumping into the Columbia River at Schwana in the extreme southwest portion of county. According to the USGS, Crab Creek serves a drainage area of some 2,228 square miles.

HISTORY:
The Columbia River has a history of flood events. Floods have occurred in 1894, 1948, 1964, 1974, and 1979. However, since several dams have been erected in the Columbia River, the likelihood of river flooding occurring has been drastically reduced.
Crab Creek has a relatively minor history of flooding despite its drainage area. Often the flooding is the result of frozen soil accompanied heavy rain causing rapid snowmelt. These regular flash floods are referred to “rainflood” in the FEMA Flood Insurance Study for Grant County dated September 30, 1988. In 1948 the worst flood in the history of Ephrata occurred on the evening in May when a severe thunderstorm caused a 8-foot wall of water to roar down Dry Creek which broke through the diversion dikes flooding a 60 block area of the city.

Grant County Flood Events

1904 Quincy 12 inches in street: first flooding of Crab Creek.

1948 Flooding in from Dry Creek in Ephrata and Sagebrush Flats-no canal

1957 Largest flood in recorded history at the City of Moses Lake and Town of Wilson Creek. Inundated land adjacent to Crab Creek and virtually the entire Town of Wilson Creek. Aggravated by the failure of a private dam 2 miles upstream.

1973 Flood Developed in Dry Creek Canyon

1996-1997 Flooding along Columbia River below Priest Rapids Dam due to a large snow melt. *Federal Disaster No. 1159 was assigned*

HAZARD IDENTIFICATION:
While dikes and other flood management devices have controlled much of the flood threat to Grant County jurisdictions, these devices have also contributed to the vulnerability of the citizens and business located within these floodplains. Without the flood control management structures, minor flooding would occur on a much more frequent basis. The "inconvenience" of minor flooding would have most likely encouraged residential and commercial development to be located on higher ground and out of flood hazard areas.

With the flood control devices in place, the "inconvenience" of minor flood events has been minimized and the residents and business owners of Grant County have perhaps gained a false sense of security - they may mistakenly assume that these devices will protect them from all floods in addition to the smaller, more frequent events.

VULNERABILITY ASSESSMENT:
All persons, property, and businesses located within the floodway and the floodplain of the Columbia River are directly vulnerable to flooding. In addition, the overall economy of Grant County is directly or indirectly vulnerable to major flood events.

In the past, those mainly affected by flooding were the families that lived along the Columbia River shoreline or along Crab Creek. With the dramatic increases in population and commercial development Grant County that has occurred in recent years, the effects of a major flood event could be long-term and very difficult to overcome.

Local building codes can mitigate the future damage of flooding if followed. Grant County Uniform Development Code Section 24.16.030 outlines the following flood management goals:

1. It is the purpose of this Chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:
2. To protect human life and health;
3. To minimize expenditure of public money and costly flood control projects;
4. To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
5. To minimize prolonged business interruption;
6. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;
7. To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;

8. To ensure that potential buyers are notified that property is in an area of special flood hazard; and
9. To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.
10. It is further the purpose of this Chapter to protect the public health, safety and welfare in those areas subject to periodic inundation due to flooding, and to minimize losses due to flood conditions in the specific areas subject to this Chapter by utilizing the methods and provisions set forth herein.

PROBABLITY AND RISK:
Based upon the historical record of flooding in the Columbia River and Crab Creek the impacts flood events have had on the citizens of Grant County, there is a **MODERATE PROBABILITY** of future flooding and a **MODERATE RISK** for the people, businesses, and infrastructure located within the floodway and the floodplain of the Columbia River and Crab Creek..

CONCLUSION:
In Grant County, floods are a threat to property and the environment, and to a lesser extent, the safety of persons and livestock located within the floodway and the floodplain.
The citizens of Grant County need to have an understanding of the flood risk and of the areas in which they elect to live and do business. **Citizens need to know what the terms FLOOD WATCH and FLOOD WARNING mean**. They need to know that the existing dike system (or any other flood control device) will not protect their property from all flood events.

Those persons that choose to live and/or work in a flood hazard area need to recognize that government is not able to totally protect them from the impacts of a flood. Those people at risk need to take the necessary actions to prepare themselves, their families, and their businesses before a flood event – not after. Grant County, along with the municipalities of Coulee City, Ephrata, Moses Lake, Quincy, Warden and Wilson Creek participates in the National Flood Insurance Program. Persons buying homes in the floodway and/or the 100-year flood plain are almost always required to purchase flood insurance as a condition of financing; however, there is no requirement that all residential structures purchase flood insurance if not required by a lending institution.

Hazardous Materials

DEFINITIONS:
Circle of Influence – A circular area which identifies a planning area for assessment of a spill or release plume impact distance. Usually it is more defined using geopolitical boundaries to describe the area for public information.

Hazardous Materials – Materials that present a risk to life, health or property when released due to their chemical, physical, or biological nature. The material may be released by leaking or spilling or any other process that enables the material to escape its container. The hazard can be an array of things; explosive, flammable, combustible, corrosive, biological agent, reactive, poisonous, toxic and radioactive.

BACKGROUND INFORMATION:
Many hazardous materials are stored, utilized and transported throughout Grant County. Agrochemicals are stored, used and transported in the area to create productive farming conditions. There are several industries in the area that pose a risk to people, property and the environment including railroads, propellant facilities, pipelines, semiconductor chemicals, agrochemical facilities and others. Another concern for Grant County is the production of illegal drugs such as methamphetamine labs. As industries grow around us, the more likely we are to experience an incident involving hazardous materials. An event involving these materials could occur at any given time of the day or night. Although a chemical release may be small, it could require an enormous response and recovery effort because of the toxicity of the chemical itself. A chemical release, depending on the scope of the event, may be manageable at the local level. However, even a small release could easily reach a catastrophic level, requiring representatives of local response agencies and local and state government to be present.[1]

HISTORY:
Grant County averages approximately twenty hazardous materials spills per year. Some of the more notable events are the 1983-1986 emission events at International Titanium and Union Carbide Plants in Moses Lake. Transportation incidents involving agrochemical spills between the years 1982 and 1986 occurred on the following roads: I-90, I-293, HWY 17 and HWY 243. In 1986, transportation accidents on Hwy 243 involving radioactive waste occurred.[1] In 1998, a catastrophic release of 33,000 pounds of caustic chemicals caused several injuries and two deaths.[2] In the year 2001 alone, Grant County responded to 27 clandestine methamphetamine labs.[1] These examples only identify a small portion of hazardous materials incidents in Grant County.

HAZARD IDENTIFICATION:

---

[1] Grant County Department of Emergency Management., 2000, Hazard Identification and Vulnerability Assessment

[2] Grant County Department of Emergency Management., 1998, Hazardous Materials Event Records

All persons, property, businesses and environment located in or around a circle of influence of transportation routes, chemical storage facilities, pipelines or industrial sites are vulnerable to hazardous materials releases. The potential impact is dependent on the nature of the material, conditions of the release and the area involved.[1] Hazardous materials incidents can occur anywhere and at anytime throughout the state. The volume and distribution of hazardous materials in a community determines the probability of an incident. Transportation routes pose a major threat because of the volume and variety of hazardous materials being transported over them.[3] Response efforts may be slowed down due to concern over the exposure of emergency personnel to the source.

In the past, most of those persons affected by a hazardous material spill or release were in the direct area where the incident happened. However, for planning purposes the circle of influence may extend to specific geopolitical boundaries for further precautionary measures. As commercial development throughout the county continues to rise, implementation of land use zoning codes surrounding current and future hazardous materials facilities can mitigate hazards.

VULNERABILITY ASSESSMENT:
Response operations of hazardous materials incidents may require multi-agency and multi-disciplinary responses such as fire responders, law enforcement, environmental containment and clean-up specialists, fish and wildlife experts, emergency medical services, environmental health and others. While some incidents may not have immediate or obvious impacts on life, property and the environment, they may have more subtle, long-term consequences.[3]

All persons, property, businesses, and the environment located within or near the circle of influence of the storage, use or transportation of hazardous materials are vulnerable. At this time, Grant County does not have an organized hazardous materials response team. However, different industries often have their own team capable of responding to hazardous materials incidences.

PROBABLITY AND RISK:
Based on past incidences of hazardous materials spills and releases, there is a **HIGH PROBABILITY** for future hazardous materials accidents. Also contributing to the probability of hazardous material releases are natural disasters including but not limited to high winds, fires, seismic activity and flooding. Due to the location of transportation systems, farms and industrial facilities in close proximity to people and property, there is also a **MODERATE RISK** to those nearby, depending on the closeness of the source. As industry grows in our area, more incidences may be expected.

CONCLUSION:
In summary, hazardous materials accidents may happen at any time of the day or night and Grant County averages many of these types of accidents per year. Hazardous materials releases can occur in many different forms which may adversely affect the health and safety of people and the

---

[3] Washington State Comprehensive Emergency Management Plan., 2003, Emergency Support Function 10

environment. Hazardous materials can be released in a variety of forms and when this happens, it may present life-threatening situations.

The use of land use zoning codes may help to mitigate future hazards of this nature. People choosing to build structures next to industrial zones, pipelines, chemical storage facilities and busy transportation routes should be aware of the hazards that may pose a risk to them.

REFERENCES:

Grant County Department of Emergency Management., 2000, Hazard Identification and Vulnerability Assessment.

Grant County Department of Emergency Management., 1998, Hazardous Materials Event Records.

Washington State Comprehensive Emergency Management Plan., 2003, Emergency Support Function 10: Hazardous Materials.

Land Movement

DEFINITIONS:
Alluvial Fan – the alluvial deposit of a stream where it issues from a gorge upon a plain or of a tributary stream at its junction with the main stream.

Landslide – ground movement that may include rock falls, deep failure of slopes, and shallow debris flows.

Swale - a low-lying or depressed and often wet stretch of land.

BACKGROUND INFORMATION:
Landslides occur in every state and U.S. territory. The Appalachian Mountains, the Rocky Mountains and the Pacific Coastal Ranges and some parts of Alaska and Hawaii have severe landslide problems. Any area composed of very weak or fractured materials resting on a steep slope can and will likely experience landslides. Although the physical cause of many landslides cannot be removed, geologic investigations, good engineering practices, and effective enforcement of land-use management regulations can reduce landslide hazards.

USGS scientists continue to produce landslide susceptibility maps for many areas in the United States. In every state, USGS scientists monitor stream flow, noting changes in sediment load carried by rivers and streams that may result from landslides. Hydrologists with expertise in debris flows and mudflows are studying these hazards in volcanic regions. The force of gravity acting on a steep slope is the primary reason for a landslide. However, there are other contributing factors that may include but are not limited to:

- Erosion by rivers or streams that undercut steep slopes.
- Weakening of rock and soil slopes through saturation by heavy snowmelt or irrigation.
- Ground movement due to earthquakes.
- Ground failure due to excessive weight from the accumulation of rain or snow; stockpiling of rock, ore, or waste piles; or large man-made structures.

Deep-seated landslides are found along the slopes of the shoreline, often referred to as ancient landslides, which may become active in particularly wet conditions. These large landslides range in size from less than an acre to several acres and may extend over a mile of shoreline. **Shallow landslides** with debris avalanches are the most common type, typically occurring during prolonged periods of heavy soil saturation from rain, snowmelt or irrigation, and involve a relatively thin layer of extremely dangerous wet soil and vegetation that can travel quickly with destructive force. **Mid-slope benches** can be hazardous slide areas. These relatively level benches on an otherwise steep slope may indicate past slope movement. **Shoreline or steep inland areas** are periodically struck with very large, rapid landslides. These large slumps or slides can cut 50 or more feet into the upland and involve tens of thousands of tons of earth.

Slope material that becomes super-saturated with water may develop into a debris flow or mud flow as it moves downhill. These flows generally occur during periods of intense irrigation or rapid snowmelt. Debris flows usually start on steep hillsides as shallow landslides that liquefy and accelerate to speeds that are typically about 10 miles per hour but can exceed 35 miles per hour. The consistency of debris flow ranges from watery mud to thick, rocky mud that can carry large items such as boulders, trees, and cars. These flows continue flowing down hills and through channels, growing in volume with the addition of

water, sand, mud, boulders, trees, and other materials. When these flows reach canyon mouths or flatter ground, the debris spreads over a broad area, sometimes accumulating in thick deposits that can damage developed areas.

Columbia Basin

The Columbia Basin, also known as the Columbia Plateau, is a vast area in eastern Washington, southwestern Idaho, and northern Oregon. The physiographic province is characterized by incised rivers, extensive plateaus, and anticlinal ridges rising to 4,000 feet above sea level. The region is underlain by Miocene Columbia River Basalt Group rocks and interbedded Neogene terrestrial sediments. Data about what lies under the Columbia River basalts are sparse. Along the Idaho border south of Spokane, steptoes that once were mountain tops consist of Precambrian Belt Supergroup sedimentary rocks and metamorphosed Cretaceous granites. These mountains were enveloped by Miocene basalts so that only the summits remain above the lava flows.

During the Pliocene and the Pleistocene, gravel, sand, silt, and clay were deposited in lakes or by aggrading streams and rivers in depressions such as the Pasco Basin, where 1,000 feet of sediment lies on top of the basalt. Glacial outwash during the Pleistocene produced huge volumes of wind-blown silt called loess. It blankets much of the Columbia Basin and in places is up to 200 feet thick. The loess-rich soils of the Palouse subprovince provide ideal conditions for growing wheat, making southeast Washington one of the major grain-producing regions of the world.

HISTORY:

Grant County has some areas that exhibit steep terrain, are heavily irrigated and have an abundance of weak soils. All of these combine to make portions of the county susceptible to land movements. It is important to note that not all of the conditions listed above guarantee that a landslide will occur just like assuming that a landslide will occur only if all of the conditions above have been met. Grant County has had landslides in the past. Evidence is clearly present along the high cliffs and steep slopes of the Columbia. Additionally, inland portions of the county, particularly in the northeastern portion of the county, have some high slope areas that are susceptible to landslides. A major hillside stabilization project began in the year 2000 for the Grand Coulee area when it was determined that the hillside was failing, despite temporary mitigation measures applied to the slope in 1999. It was found that the upper layer of the hillside consisted of Nespelem Clay, a glacial lake sediment composed primarily of clay and silt. After engineering and geologic studies were completed, it was determined that if the movement of the slope were to continue, it could severely damage the Coulee Community Hospital's helicopter pad, while also destroying a city water main. The project was completed with some repair to an installed French drain. The issue was addressed and corrected.

HAZARD IDENTIFICATION:

Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly. Debris flows, sometimes referred to as mudslides, mudflows, lahars, or debris avalanches, are common types of fast moving landslides. These

flows generally occur during periods of intense rainfall or irrigation or when there is a rapid snowmelt. They usually start on steep hillsides as shallow landslides that liquefy and accelerate to speeds that are typically about 10 mph, but can exceed 35 mph. The consistency of a debris flow ranges from watery mud to thick, rocky mud that can carry large items such as boulders, trees, and cars. Debris flows from many different sources can combine in channels where their destructive power may be greatly increased. They continue flowing down hills and through channels, growing in volume with the addition of water, sand, mud, boulders, trees, and other materials. When the flows reach canyon mouths or flatter ground, the debris spreads over a broad area, sometimes accumulating in thick deposits that can wreak havoc in developed areas. **Areas that have experienced landslides in the past tend to be most susceptible to future landslides, especially during periods of rapid snowmelt or heavy irrigation**. Because these areas consist of broken materials and frequently involve disruption of ground water flow, these dormant sites can be more vulnerable to slides caused by construction activities than adjacent, undisturbed soil.

VULNERABILITY ASSESSMENT:
Areas in which landslides can pose a problem in Grant County would more often be hilly areas with soft soils or soft soils underneath a mass of rock like the basalt cliffs throughout the coulees. Land movement in this area does not normally occur spontaneously, but it is more prevalent when water is present, whether through a naturally occurring spring or drainage/runoff area, or by way of irrigation system leaks.

PROBABILITY AND RISK:
There is a **MODERATE PROBABILITY** and a **LOW RISK** associated with landslides in Grant County. While some areas experience movement following heavy rains, this type of precipitation is not as prevalent in the eastern part of the state as it is in the coastal region. Some wheat fields in the northeastern region of Grant County have problems with heavy runoff. However, these situations typically do not apply to the county as a whole.

CONCLUSION:
The movement of land can occur unexpectedly, however, it is usually the result of a contributing factor, mainly the presence of water coming into contact with soft soils. Land slides may occur due to runoff from heavy rains or snow. Irrigation throughout Grant County could contribute to land movement problems if a leak is present. However, these incidents are much more common in the coastal side of the state due to higher precipitation and topography.

Radiological

DEFINITIONS:
Fixed Nuclear Facilities – Complexes in which fissionable fuel is stored or used for such functions as electrical power generation or testing, and manufacturing fuels and materials.

Ingestion Planning Zone – Per integrated plan, it is the ingestion zone exposure pathway emergency planning zone. Ingestion exposure pathway is the potential pathway of radioactive materials to the public through consumption of radiological contaminated water, food crops or dairy products. This planning zone extends 50 miles in radius from the nuclear power plant.

Plume – Airborne material spreading from a particular source; the dispersal of particles, gases, vapors and aerosols into the atmosphere.

Radiological Hazard – The uncontrolled release of radioactive material that can harm people or damage the environment.

Sheltering – The use of a structure for radiation protection from an airborne plume and/or deposited radioactive material.

BACKGROUND INFORMATION:
Note:
Radiological items are not hazards in and of themselves, the actual hazard is the release of radiological material. This overview is labeled 'radiological' for simplicity in planning. The paragraphs that follow discuss hazards associated with some radiological events.

Accidental radiological releases can occur anywhere radioactive materials are stored, used or transported. The release is typically in the form of a "plume-cloud" and it can have a detrimental affect on the health and safety of the people and the environment to which it comes in contact. Radiation cannot be perceived by sight, sound, smell or by feeling. Certain types of radiation are harmful to humans and the risks increase in correspondence to the length of time one is exposed to the source.[3]

HISTORY:
To date, there have been no major radiological releases affecting local jurisdictions throughout Washington State from any nuclear power generating facility. There was a potential for airborne release of radiation during the May 14, 1997 explosion in the plutonium facility at Hanford, a fixed nuclear facility in southern Washington State. The U.S. Department of Energy Hanford Site manufactured nuclear materials for the nation's defense program and the waste material contaminated many areas of the site. The Hanford Site clean-up effort is the largest environmental restoration effort in the nation.[4]

[3] WA State Hazard Identification and Vulnerability Assessment, 2001
[4] River Without Waste, 2002

HAZARD IDENTIICATION:
Grant County has no nuclear power plants within its boundaries. However, Benton County does have an operational reactor on the Hanford Site which neighbors Grant County. Areas capable of releases are Energy Nothwest's Columbia Generation Station nuclear power plant, the Hanford Site, military bases, medical and research facilities, private industry and trucks, trains and aircraft carrying radiological materials.

VULNERABILITY ASSESSMENT:
An accident at the Columbia Generating Station near Richland or the Hanford site could range from no radioactive release to a release that would require the evacuation of the general population within approximately ten miles of the incident scene. The Department of Energy Hanford Site includes storage tanks for mixed hazardous waste. Radioactive materials from an accident at either of these areas could enter the human food chain through crops or dairy products extending beyond the ten mile radius. For planning purposes, Grant County is an ingestion zone county as two sectors are within the ingestions planning zone area.[5] There are emergency sirens located at these areas.

An incident at these sites could result in a radiological or chemical hazardous materials release. Radioactive materials are also sometimes transported throughout the region via trains, trucks or aircraft for military operations or for medical reasons such as the use of x-ray equipment and for medical research purposes. Transportation accidents where radioactive materials are being carried may present a threat to the health and safety of people and the environment within a circle of influence of the accident scene.

PROBABILITY AND RISK:
Based on the past, there is a **LOW PROBABILITY** of a radiological event occurring in Grant County. While the probability for such an event is low, there is a **MODERATE RISK** associated with this hazard due to the fact that parts of Grant County fall within the ingestion planning zone.

CONCLUSION:
For planning purposes, Grant County is an ingestion zone county for the Department of Energy Hanford Site and the Columbia Generating Station, radiological exposure is a threat to the people and environment within the two ingestion planning zones. People living within these sectors of the county should take the necessary sheltering action to protect people, property and the environment should a radiological release occur. However, exposure to unsafe levels of radiation may also occur via transportation accidents and other sources.

[5] Emergency Response Plan and Procedures for Grant County, WA, ESF-10-B, Chemical and Radiological Protection Plan. Revision 8, 2000

REFERNCES:

Emergency Response Plan and Procedures for Grant County, WA, ESF-10-B, Chemical and Radiological Protection Plan., 1986, Revision 8, 2000.

Oregon Office of Energy: Nuclear Safety Division., 2002, River Without Waste: Recommendations for Protecting the Columbia River from Hanford Site Nuclear Waste. Online: http://egov.oregon.gov/ENERGY/NUCSAFE/docs/RiverWithoutWaste.pdf

Washington State Military Department, Emergency Management Division., 2001, Washington State 2001 Hazard Identification and Vulnerability Assessment.

Severe Storms

DEFINITIONS:
Blizzard – sustained wind or frequent gusts to 35 mph or greater and considerable falling and /or blowing snow that frequently reduces visibility to less than one quarter-mile.

Dust Storm – a storm of dust and debris blown by wind gusts of at least 35 mph, or caused by a downburst from a dry thunderstorm that reduces visibility to less than one quarter mile.

Heavy Snow – accumulations of 4 inches or more of snow in 12 hours or 6 inches or more of snow in 24 hours in non-mountainous areas; accumulations of 8 inches or more of snow in 12 hours **or** 12 inches or more of snow in 24 hours in mountainous areas.

High Wind – sustained wind at greater than 40 miles per hour and/or gusts to greater than 58 miles per hour.

Severe Local Storm – an atmospheric disturbance manifested in strong winds, tornadoes, rain, snow, or other precipitation (hail, sleet, ice), and often accompanied by thunder or lightning.

Severe Thunderstorm – a storm that produces hail ¾ inch in diameter or larger and/or wind gusts of 58 miles per hour or more.

Thunderstorm – a local storm usually with gusty winds, heavy rain, and sometimes hail and accompanied by lightning.

Tornado – a violently rotating column of air attached to a thunderstorm and in contact with the ground.

BACKGROUND INFORMATION:
The climate of Washington State is regulated by two primary factors:

- The strength of the jet stream or the storm track.
- The degree to which the orographic effect of the Cascade Mountain influences the flow of maritime and continental air masses.

The jet stream affects the weather of Washington State much of the year, growing stronger as autumn progresses, reaching maximum strength in winter and subsiding again in spring. In summer, the jet stream is usually very weak and is displaced to the north over Canada. Rainfall in the summer is infrequent and temperatures across the region are determined by the extent of marine air mass intrusions from the coast. Typical summer rainfall consists of showers and associated thunderstorms coming up from Oregon. The amount of shower activity is dependent upon the degree to which hot air masses with monsoon moisture work their way north from the desert southwest.

The strength, position, and orientation of the jet stream can change from year to year. This is the reason some winters are mild and comparatively dry, while others are cold and wet. The semi-

permanent winter low-pressure system in the Gulf of Alaska and the jet stream are also influenced by factors such as El Nino and La Nina. Southeastern Washington receives most of it's precipitation during the winter and early spring. When the jet stream sags south of Washington State, cold, dry wintertime continental air masses can sometimes blanket the entire Columbia Basin region.

Grant County can experience all types of severe weather except hurricanes, although on occasion, windstorms exceed hurricane force winds. There have been tornado sightings in the past.

Most storms move into Grant County with a southwest to northeast airflow. On occasion however, wind and snow events move into the county from the north accompanied by cold, arctic air. Windstorms with sustained winds of 50 miles per hour or greater occur somewhat regularly and are powerful enough to cause significant damage. Most of these storms cause transportation-related problems and damage to utilities. On occasion, homes and other structures are damaged either by high winds or falling trees. Due to its geographical position, Grant County experiences all types of weather events, especially damaging wind. Furthermore, the varied topography that exists within Grant County can generate variable wind patterns and locally accelerated winds. Likewise, the northern and southern portions of Grant County, especially along the Columbia River Gorge, can also experience locally accelerated winds.

HISTORY:

While there have been many severe storms that have impacted Grant County in the past, a few of the most notable storms to affect Grant County were the 1948 Columbia River Flood, the January 1950 Blizzard, and the December 1996-January 1997 Winter Storm and Flood. A more complete listing of these events is described below.

- January 1929 – An extreme cold front moved into the Columbia Basin. Many homes damaged by broken pipes. The Columbia River froze over.
- December 1935 – Another severe cold front moved in from the Canadian Artic. Extremely cold temperatures experienced from -10˚F to -20˚F ranges for a long period of time. The Columbia River froze over again.
- May/June 1948 – Greatest Spring Snowmelt Flooding: Snowmelt flooding on the Columbia River affected Pasco and other low lying areas along the Columbia River. The flood lasted for 45 days.
- January 1949 – An "artic blast" moved down from Canada bringing extremely cold temperatures. The Columbia River froze over.
- January 13, 1950 – The January 1950 Blizzard: A massive winter storm caused blizzard conditions in much of eastern Washington. Record snow fall and a long period of subzero temperatures occurred throughout the Columbia Basin. Several dozen fatalities occurred.
- December 1996 & January 1997 – Snow & Wind: Heavy accumulations of snow fell throughout eastern Washington including Grant County. Grant County received several days' accumulation of snow followed by high winds and rain. (FEMA Disaster Declaration #1159).

Data or frequency of severe storm events was obtained from the Special Hazard Events and Losses Database for the United States (SHELDUS) developed by the Hazard Research Lab at the University of South Carolina, and from the National Climatic Data Center (NCDC) of the National Oceanic and Atmospheric Administration (NOAA.) SHELDUS uses a variety of NOAA data sources. It covered severe weather events from 1960 through 2003 that caused more than $50,000 in property and/or crop damage.

The results showed that Grant County had 79 events that met the criteria. Of the 79 events listed in SHELDUS, there were 40 high wind events, twelve thunderstorms, ten floods, eight winter weather events, one volcanic event, three hailstorm, two lightning and two winter related avalanche/landslide events.

HAZARD IDENTIFICATION:
The effects upon Grant County resulting from a severe storm such as a thunderstorm, tornado, windstorm, ice storm, or snowstorm are likely to be similar in nature. Downed trees and power lines, the interruption of transportation routes, and damage to homes, businesses, and governmental buildings are all possible. Fatalities as a result of such events are uncommon in Grant County, but they can occur. Electrical power outages are common with almost all types of severe storm events. Possible problems may be loss of heat, refrigeration, light, cooking, computers, cash registers, gasoline pumps, restaurant cooking, milking machines, chicken warmers, and green houses. In addition, persons could be electrocuted by coming in contact with downed electrical lines.

High Wind: Possible hazards or problems may be loss of power and phone lines, danger of fire and electrocution. Toppled trees, broken limbs, collapsed barns, damage to residential and commercial structures as well as damage to cars, trucks and trailers. Multiple vehicle accidents with injuries and deaths may occur from blowing dust. Extremely violent wind storms could cause damage to large areas of the agricultural lands resulting in economic losses.

Lightning: Hazard areas may be sports venues and complexes such as soccer fields, football fields, baseball fields and golf courses that are without adequate shelter for participants and spectators. Lighting may cause electrical transformers to short resulting in power outages and/or fires in trees located near power lines. Boaters and those persons working outdoors are also vulnerable to lightning strikes. Lightning can also start fires in grassland areas.

Snow and/or Ice: The majority of problems associated with heavy accumulations of snow and/or ice will most likely be transportation related. Vehicle travel on roadways may be stopped or severely limited; essential government services and businesses may be closed because employees are unable to drive to work. Special transportation may need to be provided in order to insure that hospital and emergency services personnel can report to work. There is a danger to the traveling public who may become trapped in their vehicles for an extended period of time. The weight of heavy accumulations of snow and/or ice may cause roofs to collapse and trees to fall causing damage to power lines. A rapid warming trend following large accumulations of snow and ice can lead to flooding.

Hail: The main hazard associated with hail is the damage that falling hail, particularly hail larger than ¾ inch., can inflect upon physical structures (i.e. windows, gutters, metal roofs, vehicles), farm products (livestock and crops), and people. Hail is closely associated with thunderstorms. Hazard areas are any areas that are out in the open such as outdoor sport facility, pastures, parking lots, etc.

Tornado: The primary hazard associated with a tornado is the extreme wind velocities that they produce. Wind speeds up to 300 mph are possible. The winds from a tornado are extremely destructive. Not only do they tear apart buildings and uproot trees, but the debris causes collateral damage due to the speed with which it moves. No above ground structure is immune from the effects of a tornado.

Dust Storm: The primary hazard from a dust storm is the reduced visibility that it produces especially on roads and flight paths. Other effects include respiratory distress to people and livestock, damage to crops and removal of topsoil from farmland.

The following list is a compilation of comments and suggestions made by various stakeholders and the public regarding possible problems that could result from a severe storm. In addition to damaging homes, businesses, property, and the environment, a severe storm event in Grant County could potentially result in the following:

- Disrupted and/or damaged transportation routes and systems.
- Disruption of service and/or damage to above-ground utilities. Emergency response agencies may be delayed in responding to emergency incidents due to downed trees and utility power poles and lines or unusually heavy accumulations of storm water, snow, or ice.
- Unusually heavy rainfall or rapid snowmelt may cause surface flooding in low lying areas.

VULNERABILITY ASSESSMENT:
Severe storms, especially severe wind storms are common in Grant County during the spring and fall months and *all* areas of Grant County are vulnerable to the impacts of severe storms.

Some storms are more severe and require assistance from a variety of governmental agencies or emergency responders such as: public works, fire service, emergency medical services, search and rescue, and law enforcement in addition to utility company personnel. While local electrical power outages can occur during severe storm events, the loss of power is usually only an inconvenience causing minor consequences unless the outage continues for an extended period of time or during a period of extremely cold temperature. Extended electrical power outages occurring during winter months may require the opening of emergency shelters, particularly in cold weather.

Livestock can be vulnerable to all types of winter storms although most large dairy herds have at least limited shelter available. A severe snow event followed shortly thereafter by extremely cold

temperatures can have an adverse affect on wild animals and birds due to a lack of sufficient food, water and shelter.

PROBABILITY and **RISK:**
Based on past events, there is a **HIGH PROBABILITY** of a severe storm event occurring in Grant County. While the probability of such an event is high, there is a **MODERATE RISK** associated with this hazard due to the relatively short duration and localized impacts of such events.

CONCLUSION:
Of all natural hazards, severe local storms … especially severe wind storms are very likely to affect Grant County. High winds received by far the highest score for adverse impact in the hazard identification and risk analysis completed by Task Force participants. Weather events have the ability to cause considerable destruction and can impact the lives of large numbers of people. Grant County experiences nearly every type of weather including wind, rain, snow, fog, extreme heat, extreme cold, hail and thunderstorms. When severe weather events occur, they have the ability to significantly impact Grant County posing a danger to life and property as well as possibly causing economic losses.

Due to the frequency and possible destructive nature of severe storm events, individuals, families, and businesses should be aware of the impacts of a severe local storm and take the necessary actions to prepare themselves, their families, and their businesses before such events occur – not after. Citizens and businesses can prepare for severe storm events just as they plan for any emergency. To be better prepared for severe storm events, citizens should:

- Have a plan
- Prepare an Emergency Kit with a 3-day minimum supply of food and water
- Take advantage of Community Emergency Response Team training
- Purchase and use a NOAA Tone-Alert Weather Radio or other Tone-Alert Radio
- Inquire about emergency plans at your work, schools and places that you frequent
- Practice your plan with all of your family members

Special Hazards

DEFINITIONS:
Special (or local) Hazards – Special hazards within jurisdictions that may not have a significant impact on large areas of the county.

BACKGROUND INFORMATION:
Special hazards may include, but are not limited to the following:

- Grain elevators – dust exploding in confined areas
- Explosives manufacturing and storage locations
- Contaminated firefighting runoff

HISTORY:
In historical terms, special hazard events in Grant County are similar to hazardous materials spills or releases since many of our special hazards are related to them. However, as with grain elevators, not all special hazards are chemically toxic in nature.

HAZARD IDENTIFICATION:
The effects on Grant County due to a special hazard event may vary greatly due to the fact that these hazards typically affect only the jurisdiction where the event takes place. Fatalities and injuries may occur just as with other hazards identified in this plan. Not all special hazards are chemically toxic in nature. The problem associated with grain silos, for example, is an explosion of grain dust.

VULNERABILITY ASSESSMENT:
There are a few special hazards that are common throughout Grant County, especially during the agricultural growing and harvest seasons. Approximately 71% of the county's current land use is agricultural. Many agrochemicals are stored and transported throughout the county and are used while farming the land such as with the use of fertilizing a crop or applying a pesticide or herbicide. During the twenty year planning period, 11% (approximately 4,166 people) of the county's population growth is expected to occur in rural lands.

With such vast acreage in farmland, there are many sites throughout the county like cold storage facilities, grain elevators and agrochemical locations that have their own risks. Some of these may be located on unincorporated lands while others within city limits or within close range to residential areas. The worst case scenario event at a grain elevator would be a fire coupled with an explosion. Pressure and heat accumulates in grain elevators and a result of an explosion may be a grain-dust plume that could overcome those nearby. Fires in grain elevators pose a serious risk to fire fighters because of the pressure that can build inside the structure when liquid is added to the heat source.

Cold storage facilities use the chemical anhydrous ammonia for refrigeration processes. This chemical is highly toxic and may cause injury or fatalities at these facilities should there be a

release. These sites have contingency planning and evacuation procedures for this reason. A major release could adversely affect individuals and the nearby environment.

Anhydrous ammonia is also commonly used as a fertilizer and significant amounts may be stored at agricultural facilities. There may also be locations where bulk liquid tanks of pesticides or dry fertilizers are stored or blended. Because of the nature of these compounds, chemical releases may be extremely toxic and dangerous. All of these may result in a toxic release to the environment as well. Some of the types of locations discussed in the previous paragraphs have been subject to the A.L.O.H.A. program (Arial Locations of Hazardous Atmospheres) to determine the potential release plume size. There are some factors which may intensify the situation such as an atmospheric inversion level that might keep an ammonia cloud closer to the ground for a longer period of time. Unfortunately, only general approximations can be made for the possible width and length of a plume due to factors such as weather conditions, system design, the surrounding terrain and the size of the release.

Explosives manufacturing is another special hazard within Grant County. The most alarming possible incident at this type of industrial site is a large-scale explosion of combustible material. This situation can pose a very serious threat to workers as there may not be adequate warning time, if any warning at all.

PROBABLITY AND RISK:

Because of Grant County's strong agricultural base, there is a **HIGH PROBABILITY** for special hazards to occur. While these relate to hazardous materials, special hazards pose a **LOW RISK** on the general population here due to the fact that many of these hazards are located in remote areas.

CONCLUSION:

Grant County supports the functioning of several special hazards, especially in regards to agriculture. They are often unique to a planning region or jurisdiction by itself and would not necessarily affect the entire county or even an entire region. They may, however, have an adverse affect upon the jurisdiction near the hazard and to employees or first responders at the scene.

Transportation

DEFINITIONS:
Pipelines – Transportation arteries carrying liquid and gaseous fuel and are either buried or located above ground.

Rights-of-way and easements – An agreement between a landowner and pipeline company to allow the construction, operation and maintenance of an underground pipeline.

Transportation hazard – A natural or human caused hazard which creates the opportunity for accidents, emergencies and disasters. Transportation systems in Grant County include road, rail, air and pipeline.

BACKGROUND INFORMATION:
Note:
Although transportation in general is not a hazard in itself, factors associated with the mode of transportation such as accident size or type are the actual hazards. This overview is labeled 'transportation' for simplicity in planning. The paragraphs below summarize hazards associated with transportation.

Grant County has a variety of transportation actions occurring daily within its boundaries. There are numerous types of airplanes being used to transport cargo or passengers such as military, commercial, crop-dusting or privately owned aircraft. The size of aircraft varies from small single-engine planes and gliders to large jumbo-jets. These planes fly in and out of local municipal airports or the Grant County International Airport. Japan Airlines trains at the airport and Boeing conducts airplane testing there. Burlington Northern Santa Fe operates a railroad line that supports train traffic to include passenger and freight trains through the County. The railroad is located within close range to homes, businesses, schools and critical facilities in some jurisdictions. Amtrak passenger trains make two stops daily in downtown Ephrata. The Central Washington Railroad operates to support specific industrial areas. Road systems in Grant County include but are not limited to State highways, one Interstate freeway and a total of 2,534 miles of County roads. Due to the large size of Grant County, there are some areas with limited access and egress routes in emergency situations. The roads in Grant County provide service for passenger or commercial vehicles, agricultural machinery or vehicles and emergency personnel vehicles and equipment. There is no known quantity or type of hazardous materials on board these modes of transportation throughout the county.

There are two pipelines that intersect Grant County. Williams Gas Pipeline-West, also known as Northwest Pipeline, is a high-pressure natural gas transmission pipeline. Local public utilities receive its natural gas supply from this pipeline which comes through Warden and ends in Moses Lake. The main transmission pipeline transports more volume at higher pressures than the smaller local distribution lines. The Williams Gas Pipeline-West ranges in diameter from six to eight inches, accommodating meter stations and mainline valves along the way. This system has the ability to deliver nearly two billion cubic feet per day of natural gas at pressures up to 960

pounds per square inch in Grant County.[1] There are some areas within Grant County where the Williams Gas Pipeline-West is placed above ground.

Yellowstone Pipeline/Conoco operates refined petroleum products with a pipeline system originating in Billings, Montana. Moses Lake is one end point of this pipeline. The following products are shipped on the Yellowstone Pipeline: no-lead premium gasoline, no-lead regular gasoline, commercial jet fuel, No. 1 fuel oil and No. 2 Fuel Oil. It comes through the rolling farmland between Moses Lake and Spokane where there are small drainage areas, creeks and irrigation ditches.[2]

HISTORY:

- December 1952, Larson Air Field (Grant County International Airport)
  One of the world's worst air disasters occurred approximately five miles northwest of Moses Lake when a C-124A took off from the runway, rose about 100 feet, started to turn and plummeted to the ground. The plane was shattered and 86 of the 115 passengers on board died.[3]

- May 1989, P St. NW rail crossing in Quincy
  A freight train struck an automobile which had run the crossing, causing forty cars and both engines to derail. This accident resulted in four injured individuals and one fatality. Fortunately, this train did not spill any hazardous materials.[4]

Picture courtesy of The Quincy Valley Post-Register

[1] Williams Gas Pipeline-West, 2005
[2] Yellowstone Pipeline Area 4, 2002
[3] Brown, Lynnita, 2002-2005 Korean War Educator
[4] Lindberg, Don, 1989 The Quincy Valley Post-Register

- January 1989, SR Highway 17 near McConihe Flats Road
  A fuel tanker truck overturned resulting in the closure of Highway 17 for 11 hours between the Ephrata Speedway and the west entrance to the Port of Moses Lake. The closure was the longest in eleven years and many commuters had to take alternate routes as the accident occurred at 3:12pm. Forty firefighters responded to the scene.[5]

- Although there has been no major pipeline break within Grant County, there have been a few incidences within the State of Washington. The following is one of the more notable events:
  In June of 1999, a pipeline carrying gasoline leaked and caught fire at Whatcom Falls Park in the city of Bellingham. This incident caused two 10-year-old boys to burn to death and an 18-year-old male died as fumes overcame him and he drowned in the water downstream. This incident resulted in 277,000 gallons of gas spilling into the creek bed.[6]

- Collision accidents in 2004 on the following State Route sections in Grant County:[7]

SR 283 – Entire Route (I-90 to SR 28)

#Collisions	#Fatalities	#Injuries	#Vehicles
4	0	7	14

SR 17 – Warden (SR 170) to Moses Lake (I-90) total numbers

#Collisions	#Fatalities	#Injuries	#Vehicles
19	3	24	40

SR 17 – Moses Lake (I-90) to Ephrata (SR 282)

#Collisions	#Fatalities	#Injuries	#Vehicles
65	1	48	131

SR 243 – Vernita to SR 26

#Collisions	#Fatalities	#Injuries	#Vehicles
36	3	22	51

HAZARD IDENTIFICATION:

Transportation infrastructure will likely sustain damage during a significant disaster event. The effectiveness of response and recovery efforts will depend on the extent of damages.[6] Transportation infrastructure includes roads, lighting fixtures, airport runways, terminals and railroad stations, bus stations, and road signs such as mileage and exit route signs. The effects upon Grant County resulting from transportation incidents vary in scope. Transportation

[5] Grant County Dept. of Emergency Management, 1989 Hazardous Materials event Records
[6] Washington State Hazard Identification and Vulnerability Assessment, 2001
[7] Washington State Department of Transportation, Standard Collision Summary: Year by Month, 2004
[6] Washington State Comprehensive Emergency Management Plan, 2003, Emergency Support Function 1

accidents may cause several problems to occur including but not limited to: downed power lines, hazardous materials spills, injuries and fatalities, lengthy road closures, fires, hindered airport operations, limited freight movement and possible economic loss.

A major airline crash may result in a mass casualty incident with hundreds of injuries. Accidents with planes such as crop dusters or those carrying fire retardant may result in hazardous material spills and the crash of a military aircraft with munitions or classified material on board may require explosive ordinance disposal or military security. When planes crash in remote areas, it may produce the need for extensive search and rescue operations.

The greatest risk coupled with freight train accidents is hazardous materials spills and it may require a substantial clean-up effort and the evacuation of homes and businesses in the area. If an accident with a passenger train like Amtrak occurs, it may result in a mass casualty incident. Amtrak trains transport passengers in Grant County with two stops per day in Ephrata.

Privately owned vehicles, trucks carrying various kinds of cargo and buses provide transportation to people on our highways and roads. In the event of a major accident on highways or roads throughout Grant County, the results may be catastrophic with multiple injuries, fatalities, hazardous materials spills or road closures.

Most pipelines are buried, but there are some exposed areas where a pipeline crosses creeks, drainage areas or irrigation ditches. This description is representative of the area the Yellowstone Pipeline/Conoco crosses on its way toward Moses Lake.

VULNERABILITY ASSESSMENT:

Grant County is vulnerable to several types of transportation emergencies. The worst type of accident would involve mass casualties along with a hazardous materials release and lengthy transportation route closures due to infrastructure damage and debris clearing. Hazardous materials spills may slow down response efforts to the injured due to concern about exposure of emergency personnel. Several state highways, one interstate freeway, county roads and city streets are widely used by countless people every day in Grant County. Those who use these roads are vulnerable to accidents, as are those who utilize airspace in Grant County and those who travel by rail. Severe weather conditions and other natural hazards may also contribute to the number of transportation accidents throughout the area.

Buried and exposed pipelines are vulnerable to breaks and punctures caused by earth movement, material failure, operator error, construction defects and tampering. If a pipeline shifts during land movement, it can sheer and come into contact with an ignition source, causing the fuel to explode or burn. There are however, monitoring markers to identify soil movement for potential strain on the pipe. Pipelines and rights-of-way are frequently surveyed for land movement and by law; an entire pipeline has 26 fixed wing or rotary wing aerial surveys each year. There is a moderate risk to the geopolitical areas which lie within two miles of a pipeline. However, at least annually, someone walks the pipelines and more surveys are conducted when potential problems arise, particularly after increased rainfall.[6] Williams Gas Pipeline - West completes one fixed-wing aerial patrol of their system each week and annually, one helicopter survey is

[6] Washington State Hazard Identification and Vulnerability Assessment, 2001

completed. There are some areas where this pipeline is found above ground in Grant County. Both the Williams Gas Pipeline – West and the Yellowstone/Conoco Pipeline companies have emergency contingency plans which are updated regularly. Fuel and gas shortage is addressed in this plan as a portion of transportation hazards. This includes many forms of fuel such as natural gas, diesel, unleaded gasoline, propane and butane.

PROBABLITY AND RISK:
Based on past transportation incidents in Grant County, there is a **MODERATE PROBABILITY** for future incidents. There is a **MODERATE RISK** to the safety and property of individuals involved and some risk to the environment depending on the possible spill or release of hazardous materials at the accident scene.

CONCLUSION:
Grant County supports the functioning of four modes of transportation on a daily basis to include road, rail, air and pipeline. Natural and technological hazards may create unsafe transportation conditions and present risks to those who are involved or located near the scene of an accident. A transportation accident resulting in mass casualties, a hazardous materials release and long-term transportation route closures would be the worst case scenario for a transportation incident.

REFERENCES:

Brown, Lynnita, 2002-2005 Korean War Educator 1-3.
Online: http://koreanwar-educator.org/topics/homefront/p_globemaster_crash.htm

Grant County Department of Emergency Management, 1989, Hazardous Materials Event Records.

Lindberg, Don, 1989, The Quincy Valley Post-Register., May 25, 1989 Vol. 42, No. 45

Washington State Department of Transportation., 2004, Standard Collision Summary: Year by Month

Washington State Military Department, Emergency Management Division., 2001, Washington State 2001 Hazard Identification and Vulnerability Assessment.

William's Gas Pipelines – West., 2005, Public Safety Response Manual. Maps, General Information.

Yellowstone Pipeline Company Area 4., 2002, Integrated Contingency Plan. Maps, Section 5; Maps, Emergency Response Plan Area 4.

Washington State Comprehensive Emergency Management Plan, 2003, Emergency Support Function 1: Transportation.

Utilities

DEFINITIONS:
Hydroelectric power – Electric power produced by the force of moving water.

Maximum contaminant level – A contamination level in drinking water due to natural or other factors which results in public health advisories when an identified maximum contamination amount is exceeded.

BACKGROUND INFORMATION:
Note:
While utilities themselves are not a hazard, this overview describes several situations including utility shortage, breach or failure which would be the actual hazards. For simplicity, this overview is termed 'utilities' to include several different items. Often times, utilities experience damages caused by natural hazard events including but not limited to severe storms, earthquakes, drought and flooding. The paragraphs that follow give general descriptions of the utility networks comprising much of our critical infrastructure in Grant County.

Grant County is fortunate in that it has its own consumer-owned Public Utility District which supplies most of the areas' electrical power supply. The company operates two dams on the Columbia River, Priest Rapids Dam and Wanapum Dam. The Grant County Public Utility District also operates a few smaller hydroelectric stations in the area.[1] The Grant County P.U.D. is Eastern Washington's coordinator for mutual aid from one utility to another in emergency situations.[2]

Grant County is also home to the Columbia Basin Irrigation Project which started in the early 1930's. The project has the potential to irrigate over 1 million acres of Columbia Basin farmland. At this time, the project serves about 500,000 acres. Without the functioning of this system, farms would not be able to sufficiently irrigate their crops.[3]

Sewer systems in the county rely on pumps, lift stations, gravity and individual septic tanks. Water resources for human consumption within Grant County rely on wells, water towers and water treatment facilities.

There are also many forms of communication within Grant County to include television, telephone, wireless, and internet and radio service. Without a power source, most forms of communication would not be available to its users or the functioning of the service may only last for a short duration. Local jurisdictions, state, federal and other supporting agencies should develop and make available the personnel and equipment to fulfill roles in communications and warning when necessary. As a minimum, the State of Washington Military Department recommends that all agencies should expect to sustain immediate operations for 72 hours.

---

[1] Grant County Public Utility District, 2005
[2] Garnant, Gary., 2005, Grant County PUD Response to Local Disaster Involving Blizzard Conditions and Mass Power Outages.
[3] U.S. Bureau of Reclamation, 2005

HISTORY:

May 20th, 1998:

The worst communications failure in 37 years of satellite service occurred. Major problems with the satellite Galaxy IV affected 120 entities in the paging industry. Radio and other forms of broadcasts were affected by these problems. Most of the country's paging messages are relayed around the country by one satellite, even though there are more than 200 communications satellites orbiting the earth. Many of those satellites serve the United States.[4]

June 15th, 1991:

A canal breached, washing out a portion of Interstate 90 near the City of Moses Lake.

1999-2004:

Grant County had approximately twelve water boiling advisories in unincorporated and incorporated areas during this period. In some instances, the maximum contaminant level was exceeded while in others, the advisory was the result of other testing factors.[5]

HAZARD IDENTIFICATION:

Most power outages within Grant County only last for a short period of time, in fact, the average power outage time is 2.19 hours for an entire year. This electrical power provider has a 99.99 percent reliability rate.[2] While it is possible that a major power outage could occur with the entire Northwest Gridline, Grant County has the ability to separate from this gridline and function on its own using power solely from the two dams that the Public Utility District operates. It is estimated that this process would take two to three days to accomplish.

Irrigation difficulties may threaten Grant County's agriculturally based economy quite quickly. Considering its arid climate, the County depends on the Columbia Basin Irrigation Project to supply adequate water to crops. It is also possible that flooding would occur due to a significant canal breach.

Water resources for human consumption within Grant County stem from underground aquifer sources. The water passes through treatment facilities and is stored in towers. There are also many parts of the county that rely on individual wells. As a result of testing completed on water sources, some areas have had water boiling advisories in effect in the past. In some situations, contaminants in the water were above the maximum contaminant level. In other situations, people were advised to boil their water based on factors not related to the maximum contaminant level where only a precautionary advisory was given.[5]

Several areas in Grant County operate on individual septic tanks which do not rely on a community sewer system for their functioning. However, the more densely populated areas are served by a local sewer system with sewer lift stations.

---

[4] Natural Hazards Research and Applications Information Center, 1998

[5] Washington State Department of Health, 1999-2004

[2] Garnant, Gary., 2005, Grant County PUD Response to Local Disaster Involving Blizzard Conditions and Mass Power
Outages.

[5] Washington State Department of Health, 1999-2004

There are many factors that can contribute to problems with communications. Telephone lines are susceptible to wind, ice, digging accidents and in some cases even squirrels will gnaw on the lines and cause damage. Without power, television will not function to support emergency alert information which is imperative in a disaster situation, especially for those who require captioning. Radio and cellular towers are impossible to operate without a power source. Although some towers have back-up power through the use of a generator or battery, it is unlikely that it would support the functioning of those towers for more than a period of hours. Paging messages controlled by satellite may fail without any prior warning, impacting emergency response communications. Telephone service may go out during a disaster due to a large volume of calls taking place at the same time on limited systems. Emergency communication failure is one of the most urgent situations to correct in a disaster situation as without it, response efforts are limited to the information they have on scene.

A loss of gas or fuel service is unlikely; however, if communities could not rely on service stations to supply fuel for travel, it could pose some major problems. One of those problems might be the inability of people to evacuate to safety. In more rural areas, some landowners may have their own supply of fuel, but these would not be sufficient to serve the entire county. Although gas pipelines are also utilities and can serve to heat homes and other structures, they are considered primarily as transportation vessels through which different fuels are distributed. Therefore, information about gas pipelines are included in the transportation section of this chapter.

The failure, disruption or a breach at one of the major dams could pose a serious risk to people, property and the environment when considering their massive structures are built of concrete and large generators that require significant amounts of oil. The dams are staffed on a daily basis. One of the dams the P.U.D. operates is the Potholes East Canal Project, at the east end O'Sullivan Dam. It has an Emergency Action Plan for sudden failure although it is not a very expansive dam. A similar small powerplant on a local irrigation canal is the Quincy Chute Hydroelectric Project. It also has an emergency action plan. Continuing south along the Columbia River is Priest Rapids Dam and to the north is Wanapum Dam. Finally, in the northernmost section of Grant County is Grand Coulee Dam operated by the United States Bureau of Reclamation. The construction of this dam created a vast reservoir of water called Lake Roosevelt. The Grant County Department of Emergency Management has each of the Emergency Action Plans for these dams and has identified affected populations as relates to failures at these dams for emergency response and notification purposes. In all, there are 52 structures which the Washington State Department of Ecology considers dams in Grant County. Not all of these structures are large or even fully operational; they are, however, listed due to the fact that even a small amount of water can present a hazard to life safety.

VULNERABILITY ASSESSMENT:

Outages or shortages in the utilities described above make Grant County vulnerable to damages in the areas of health, safety, property and economics. Loss of communication is one of the greatest risks associated with natural and technological disasters. Without information, the public can make assumptions or take actions that are unsafe or unnecessary.

Extremes in temperature are part of life in the Columbia Basin. During the cold winter months, a loss of electrical power makes heat a critical component for survivability. The most detrimental possible outcome associated with utility outages or shortages would be a breakdown of societal functioning joined with loss of life and property damages.

PROBABILITY AND RISK:
While there is **LOW PROBABILITY** for utility shortages or failure in Grant County, there is a **HIGH RISK** to people and property when a system shortage or failure lasts more than a few hours. This is due to a high level of dependence on these resources. There are alternate resources like back-up generators and water wells, but they may function only to serve basic human sustainability.

.

CONCLUSION:
It is important to note in this document that when the public is asked to limit their phone use in a disaster situation, it is imperative to follow this instruction. First responders are an absolute priority in disasters. If they are unable to communicate, it may greatly limit their response capabilities, creating a disaster within a disaster. Grant County is privileged in one way, considering the reliability of utilities in its communities. However, it is recommended by the Grant County Department of Emergency Management and the Grant County Public Utility District to have an alternate heat source for an all-electric home and to have a family emergency supply kit with essentials to sustain 72 hours.[2]

[2] Garnant, Gary., 2005, Grant County PUD Response to Local Disaster Involving Blizzard Conditions and Mass Power Outages.

REFERENCES:

Garnant, Gary, 2005. Grant County PUD Response to Local Disaster Involving Blizzard Conditions and Mass Power Outages., September 30, 2005; 1-2.

Grant County Public Utility District, 2005.
Online: www.gcpud.org/aboutus.htm

Rubin, Claire B., 1998. What Hazards and Disasters are Likely in the 21st Century – or Sooner? Telecommunications Failures; 3.
Online: www.colorado.edu/hazards/wp/wp99.html

U.S. Bureau of Reclamation, 2005.
Online: www.usbr.gov/dataweb/html/columbia.html

Washington State Department of Health: Office of Drinking Water 1999-2004. Grant County Boil Water Advisories 1999-2004.

Volcanic Activity

DEFINITIONS:

Debris Flow or Lahar – fast-moving slurry of rock, mud, and water that looks and behaves like flowing wet concrete; similar to but coarser and less cohesive than a mudflow.

Pyroclastic Flow – a hot, fast-moving avalanche of ash, rock fragments and gas that moves down the sides of a volcano during explosive eruptions or when the steep edge of a dome breaks apart and collapses.

Tephra – fragments of rock and natural glass that is blasted from a volcano during a violent eruption and then falls to Earth.

USGS – United States Geological Survey

Volcanic Ash – small fragments of rock and natural glass that is blasted from a volcano during a violent eruption and then falls to Earth. During large events, volcanic ash can travel hundreds of miles.

Volcano – a vent in the earth's crust through which magma (molten rock), rock fragments, gases, and ashes are ejected from the earth's interior. A volcanic mountain is created over time by the accumulation of these erupted products on the earth's surface.

BACKGROUND INFORMATION:
The Cascade Range extends more than 1,000 miles forming an arc-shaped band extending from Southern British Columbia to Northern California lying roughly parallel to the Pacific coastline and includes 16 major volcanic centers. In addition to the standard volcanoes in the Cascade Range, a stretch of these volcanoes (from about Mount Rainier to Lassen Peak) is made up of a band of thousands of very small, short-lived volcanoes that have built a platform of lava and volcanic debris. Rising above this volcanic platform are a few strikingly large volcanoes that dominate the landscape. The Cascades volcanoes define the Pacific Northwest section of the "Ring of Fire", a fiery array of volcanoes that rim the Pacific Ocean. Many of these volcanoes have erupted in the recent past and will most likely be active again in the future. Given an average rate of two eruptions per century during the past 12,000 years, these disasters are not part of our everyday experience.

While there are no volcanic peaks within Grant County, we can be affected by tephra associated with a volcanic eruption from the Cascade Range volcanoes. All of the other hazards associated with volcanoes (pyroclastic flow, lahars, lateral blast, lava flow, etc.) are too remote to be considered a serious threat to Grant County. So, for the purposes of this Plan, we will only focus on the volcanic hazards associated with tephra.

Geologic evidence indicates that most of the Cascade Range volcanoes have erupted in the past 4,000 years and will no doubt erupt again in the foreseeable future. Due to the topography of the region and the prevailing weather patterns, eruption events on Glacier Peak, Mount Rainier,

Mount St. Helens, Mount Hood, and Mount Adams are the volcanoes most likely to produce conditions that would adversely impact portions of Grant County.

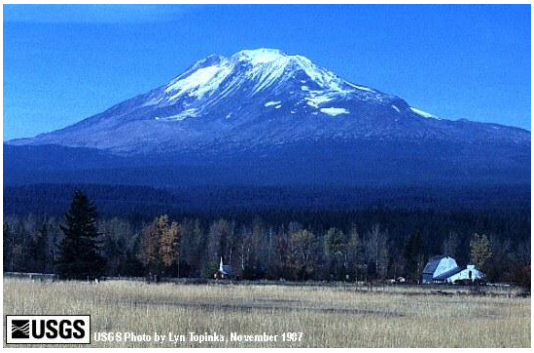
HISTORY:

Eruptions in the Cascades have occurred at an average rate of 1-2 per century during the past 4,000 years, and future eruptions are certain. Seven volcanoes in the Cascades have erupted within the past 225 years. Four of those eruptions would have caused considerable property damage and loss of life if they had occurred today without warning – the next eruption in the Cascades could affect hundreds of thousands of people. The most recent volcanic eruption events within the Cascade Range occurred at Mount St. Helens in Washington (1980-1986) and at Lassen Peak in California (1914-1917). Mount St. Helens is currently active at the time of this writing with lava-dome building and infrequent releases of small amounts of tephra.

Mount St. Helens

With an elevation of 8,364 feet, Mount St. Helens is small compared to the other Cascade Range volcanoes. Her size belies her robustness. She is the most active of all of the Cascade Range volcanoes. Mount St. Helens is the most prolific producer of tephra in the Cascade Range. As reported by the USGS, volcanoes commonly repeat past behavior.[7] So, it is quite likely that the conditions experienced during the May 1980 eruption are likely be somewhat similar again the next time Mount St. Helens erupts.

Mount Adams



As one of the largest volcanoes in the Cascade Range, Mount Adams soars 12,277 feet into the air. It dominates the skyline of south central Washington. As detailed in USGS research[8] , Mount Adams is of primary concern to Yakima, Klickitat, and Skamania counties due to the high potential of debris avalanches and lahars. While not as large a tephra producer as Mount St. Helens, Mount Adams is still a threat. During much of its history, Mount Adams has displayed a relatively limited range of eruptive styles. Highly explosive eruptions have been rare. Compared to the tens of large explosive eruptions at nearby Mount St. Helens during the past 20,000 years, eruptions of Mount Adams have been meek.[9]

---

[7] Wolfe, W.E. and Pierson T. C., 1995, USGS Open-File Report 95-497
[8] Scott, et al., 1995, USGS Open-File Report 95-492
[9] Ibid

Mount Hood

With an elevation of 11,237 feet, Mount Hood ranks as the fourth highest and middle of the pack by volume of the Cascade Range. Mount Hood is located east of Portland, Oregon and presents a majestic picture on clear days. While not the most active volcano in the Cascade Range, Mount Hood is still a hazard. The primary threat to Grant County is from tephra. Mount Hood has historically produced a relatively modest amount of tephra during past lava flow and lava-dome eruptions. Most tephra fallout was caused by clouds of sand- and silt-size particles that rose from moving pyroclastic flows produced by lava-dome collapse. Tephra was also generated by explosions driven by volcanic gases. Both types of tephra clouds probably reached altitudes of 3,000 to 50,000 feet above the volcano and were then carried away by the prevailing wind, which blows toward sectors northeast, east, or southeast of Mount Hood about 70 percent of the time[10].

Mount Rainier

At 14, 410 feet, Mount Rainier is the tallest peak in the Cascade Range. It towers over the landscape of the southern Puget Sound area and is visible from Longview to Mount Vernon. Mount Rainier is a dormant volcano whose load of glacial ice exceeds any other mountain in the conterminous United States.[11] A Mount Rainier eruption will probably produce lahars, pyroclastic flows, lava flows, debris avalanches and flows, and ballistic blasts. In terms of their potential effects, lahars from Mount Rainier constitute the greatest volcano hazard in the Cascade Range.[12] Fortunately, these volcanic hazards are not a concern to Franklin County. The only hazard that Mount Rainier poses to Franklin County is tephra fall. Mount Rainier is a moderate tephra producer relative to other Cascade volcanoes. Eleven eruptions have deposited layers of frothy tephra (pumice) near Mount Rainier in the past 10,000 years, most recently in the first half of the nineteenth century.

[10] Scott, et.al., 1997, USGS Open-File Report 97-89
[11] Hoblitt, et al, 1998, USGS Open-File Report 98-428
[12] Ibid.

Given the evidence discovered through research, it is estimated that Mount Rainier averages an eruption about once every 900 years.[13]

Glacier Peak

Glacier Peak, unlike other Cascade volcanoes in Washington, does not stand as a prominent backdrop to metropolitan centers. Glacier Peak's attractions, as well as its hazards, thus tend to be overlooked. Yet like most other Cascade volcanoes, Glacier Peak has erupted several times since the Ice Age glaciers retreated 15,000 years ago most recently around the eighteenth century. Since glacial times Glacier Peak has had larger and more explosive eruptions than any Washington volcano except Mount St. Helens. About 13,100 years ago, Glacier Peak generated a sequence of nine tephra eruptions within a period of less than a few hundred years. *The largest ejected more than five times as much tephra as the May 18, 1980, eruption of Mount St. Helens.* From these eruptions, there are tephra deposits more than a foot thick near Chelan, Washington. If similar eruptions took place today, they could place nearby communities at serious risk.

USGS Open-File Report 95-499
Mastin and Waitt, USGS 1995 Open-File Report, et.al., 1995

Mt. Baker

Mount Baker is an active volcano. Its most recent activity was in the mid-1800's at a time when permanent populations around its base were few and infrastructures, such as roads, power lines and other structures, were virtually non-existent. Although most of the area adjacent to Mount Baker is still largely unpopulated (much of the mountain is in the Mt.Baker-Snoqualmie National Forest), population patterns and infrastructure are much different than 150 years

[13] Hoblitt, et al, 1998, USGS Open-File Report 98-428

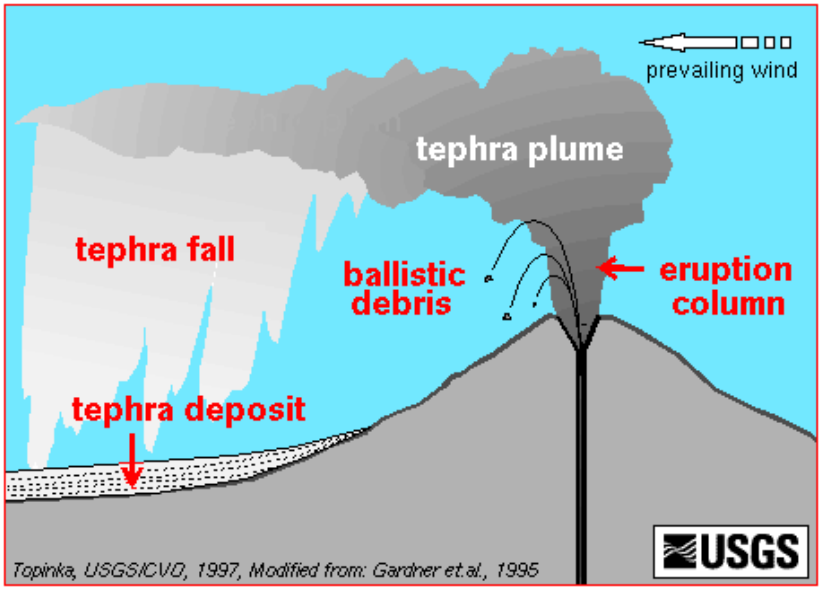
ago, and each year greater and greater numbers of people live and play in areas that could be affected by future volcanic activity. Given the evidence discovered through research, it is estimated that Mount Rainier averages an eruption about once every 900 years.[14]

HAZARD IDENTIFICATION:

We know from geological evidence that Mount Baker, Glacier Peak, Mount St. Helens, Mount Rainier, Mount Hood, and Mount Adams have produced volcanic events in the past. Several of these events, if they took place today, would place Grant County communities at risk. Volcanic hazards to Grant County from Mount Baker, Glacier Peak, Mount St. Helens, Mount Rainier, Mount Hood, and Mount Adams are limited to tephra fall. Available research conducted by the United States Geological Service includes parts or all of Grant County in the projected "footprint" of tephra fall for the above listed volcanoes.

Tephra

Tephra consists of fragments of molten or solid rock which are ejected into the atmosphere and then fall back to the earth's surface. Tephra is further divided into three classes; block (>64 mm), lapilli (2-64 mm) and ash (<2 mm.) The fragments are usually carried away from the volcano by the wind. During magmatic eruptions, a volcano blasts the fragments into the atmosphere with tremendous force, forming a vertical eruption column. Eruption columns can be enormous in size and grow rapidly, reaching tens of kilometers (miles) in height and width in 30 minutes or less. As particles in the eruption column are carried downwind they form an eruption cloud or tephra plume. Particles in the tephra plume begin to fall out of the plume almost immediately, with the larger and heavier particles (block tephra) falling out close to the volcano and progressively smaller and lighter particles falling out with increasing distance downwind. Thus, the distribution of tephra is largely controlled by the strength and direction of the wind during an eruption, whereas particle size and deposit thickness are largely controlled by how explosive the eruption is and the volume of material ejected.



[14] Hoblitt, et al, 1998, USGS Open-File Report 98-428
Gardiner, et.al., 1995, USGS Open-File Report 95-498

Tephra hazards vary from a nuisance to life-threatening. Tephra plumes pose a serious hazard to aviation because particles in plumes can damage aircraft systems and jet engines, resulting in loss of power and damage to equipment. In addition, particles in a plume can sandblast aircraft windshields such that visibility is lost. On the ground, the hazards to life from tephra vary depending upon the amount that falls and the health of individuals. In general tephra hazards diminish downwind. High concentrations of tephra, such as ash, can make breathing difficult for people and livestock. Burial by tephra can collapse roofs of buildings and other structures, break power and telephone lines, and damage or kill vegetation. Wet tephra is 2 to 3 times heavier than dry uncompacted tephra and adheres better to sloping surfaces. Ten centimeters (4 inches) of wet tephra impose a load in the range of 20 to 25 lb/ft^2, this equates to between 2,000 and 2,500 pounds for a 10' x 10' area; sufficient to cause some roofs to collapse. Minor amounts of tephra pose little threat to healthy individuals but may affect people with respiratory problems, the elderly, infants, and the infirm. Even minor tephra falls, however, can be detrimental to machinery (cars, lawn mowers, computers, etc.), can short out power transformers and electric lines, can be a nuisance to remove from roads and airports, can cause panic due to darkness during daylight hours, can cause traffic accidents because of reduced visibility, clog waterways such as municipal water system uptakes, wastewater treatment plants, irrigation ditches and machinery, and can cause respiratory and eye problems for pets and livestock.

Figure 1: Samples of ash (left two piles) and lapilli (right two piles.)

Ash can clog and/or restrict breathing passages and may cause death; however, a short period of exposure has not been found to be harmful to persons in normal health. When an ash cloud mixes with rain, sulfur dioxide combines with water to form diluted sulfuric acid that may cause minor (but painful) burns to skin, eyes, nose, throat, and mucous membranes. In addition, acid rains may also affect water supplies and agricultural products. Even fairly small concentrations of ash fall can effectively wipe out all crops in a large area for at least one season, longer if the concentrations are deep enough.

The following list is a compilation of comments and suggestions made by various stakeholders and the public regarding possible problems that could result from a volcanic event.

In addition to damaging homes, businesses, property, and the environment, a volcanic event in Grant County could potentially result in the following:

- An ash fall event could cause numerous transportation-related problems and delay first response agencies in responding to emergency situations.
- Ash fall could cause electrical power failures to critical facilities.
- Drastically increased number of respiratory patients at hospitals and clinics.

(Many of the Mitigation Task Force members recall first hand the dramatic effects the 1980 eruption of Mount St. Helens and how it affected Grant County communities, business, agriculture, the local economy, and the ability to provide essential municipal services.)

VULNERABILITY ASSESSMENT:

The degree of volcanic hazard from the volcanoes of the Cascade Range depends upon the type, size, and origin of the eruption. While the possibility of a large volcanic eruption exists, these types of events are typically separated by several hundred to a few thousand years and it is unlikely that we will see such an event in our lifetimes. The effect to Grant County from a volcanic eruption in the Cascade Range is primarily limited to tephra fallout. There is also a potential that watershed areas (Columbia River) could experience increased sediment loads. This is likely to affect fish spawning grounds and possibly municipal water and wastewater systems as well as irrigation systems within the Columbia Basin Reclamation Project.

Because of the flow direction of prevailing winds, the majority of airborne ash would most likely be carried toward the population of Grant County should an eruption occur. Grant County could receive tephra and ash from any number of Cascadian volcanoes however; Mount St. Helens, Mount Rainier, and Mount Hood are the primary volcanoes of concern. The 1980 eruption of Mount St. Helens produced enough ashfall to cover many areas of Grant County with several inches causing commerce to come to an abrupt stop and causing emergency responders, public works, and others, a multitude of problems. The figures that follow detail the probability of ash accumulation (1 cm and 10 cm) from the combined hazard of all Cascade Range volcanoes.

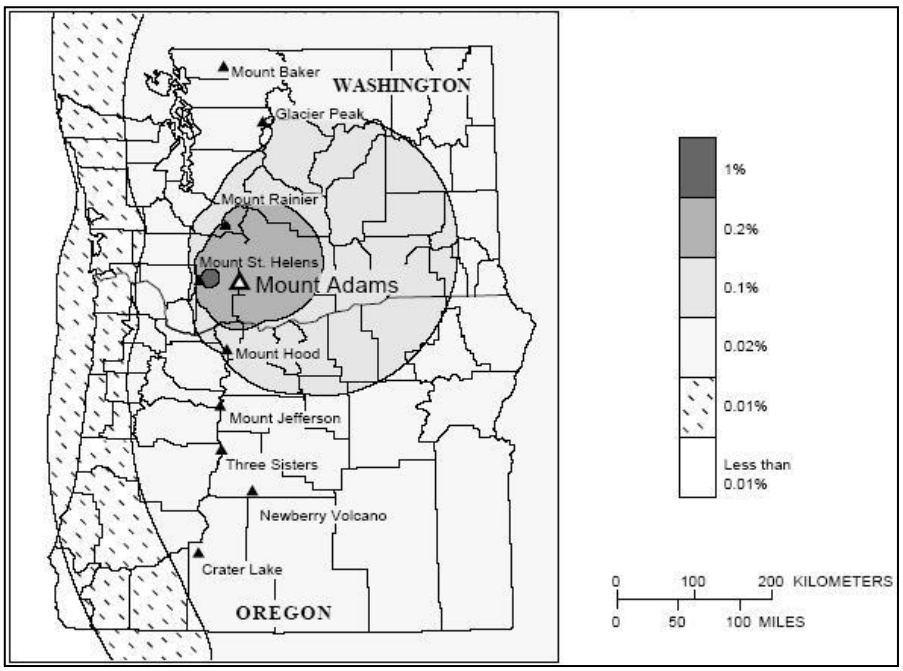


Figure 2: Annual probability of 1 cm or more of tephra accumulation in Washington and Oregon from major Cascade volcanoes.

Source: Scott, W. E., Iverson, R. M., Vallance, J. W., and Hildreth, W., 1995, Volcano Hazards in the Mount Adams Region, Washington: USGS Open-File Report 95-492, p. 9. Online: http://vulcan.wr.usgs.gov/Volcanoes/Adams/Hazards/OFR95-492/framework.html

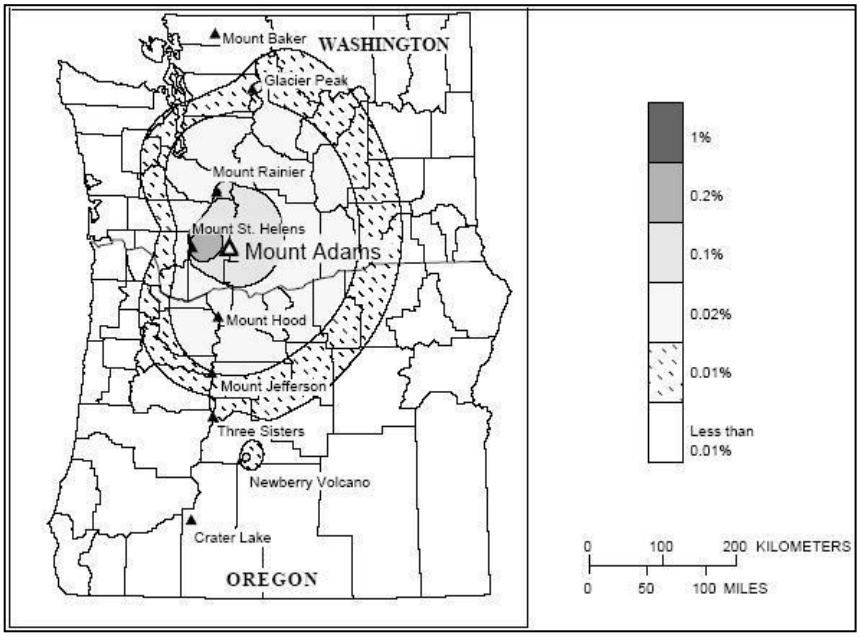


Figure 3: Annual probability of 10 cm or more of tephra accumulation in Washington and Oregon from major Cascade volcanoes.

Source: Scott, W. E., Iverson, R. M., Vallance, J. W., and Hildreth, W., 1995, Volcano Hazards in the Mount Adams Region, Washington: USGS Open-File Report 95-492, p. 9. Online: http://vulcan.wr.usgs.gov/Volcanoes/Adams/Hazards/OFR95-492/framework.html

PROBABLIITY AND RISK:

Because of the historical infrequency of such events, it is unlikely that we will see a volcanic eruption in our lifetimes. However, due to the prevailing winds within Grant County, the impacts of a major eruption from Mount Adams, Mount Hood, Mount Rainier, Glacier Peak, Mount Baker or Mount Saint Helens to persons, property, infrastructure, and the environment in Grant County would be serious though not necessarily catastrophic. Therefore, there is a **LOW PROBABILITY** of such an event occurring but a **MODERATE RISK** to persons, property, and the environment in Grant County should an eruption occur.

CONCLUSION:

Although the probability of a volcanic eruption is low, if an eruption were to occur, the greatest threat to life, property, infrastructure, and the environment in Grant County would most likely be from tephra originating from Mount Adams, Mount Hood, Mount Rainier, or Mount St. Helens. Based on past events and especially the 1980 eruption of Mount St. Helens, future eruptions from any of these volcanoes will almost certainly be preceded by an increase in seismic (earthquake) activity, and possibly by measured swelling of the volcano and emission of volcanic gases. The University of Washington - Pacific Northwest Seismograph Network, in cooperation with the USGS, monitors seismic activity of the Cascade Range volcanoes that could signal a possible future eruption. In addition, the USGS monitors gas emissions from several volcanoes to detect possible changes in the volcano's interior "plumbing system" that may be a warning of impending magma activity or an increase in hydro-volcanic activity in an effort to predict the likelihood of an eruption event. This ability to monitor seismic and other types of activity at the Cascade Range volcanoes provides a warning system of sorts for volcanic eruptions that could impact Grant County. The recent activity of Mount St. Helens in the fall of 2004 illustrates how seismic activity and the releases of certain gases correlated with the volcanoes must recent eruptions.

The 1980 Mount St. Helens eruption made it clear that preparing for and responding to a volcanic event must involve a wide variety of agencies and jurisdictions. Interviews were conducted with city and county officials present during the eruption. Most have stated that there were a variety of effects to city and county governments. For example, most jurisdictions took the simple precaution of checking roof loads and gutter systems, changing the air filters in city/county vehicles every few days, and minimizing the amount of driving done in city/county vehicles. Other precautions included monitoring ventilation filters, water and wastewater system quality, and air quality.

REFERENCES:

Scott, W.E., Iverson, R. M., Vallance, J. W., Hildreth, W., 1995, Volcano Hazards in the Mount Adams Region, Washington: USGS Open-File Report 95-942. Online: http://vulcan.wr.usgs.gov/Volcanoes/Adams/Hazards/OFR95-492/framework.html

Hoblitt, R.P., Walder, J.S., Driedger, C.L., Scott, K.M., Pringle, P.T., and Vallance, J.W., 1998, Volcano Hazards from Mount Rainier, Washington, Revised 1998: USGS Open-File Report 98-428. Online: http://vulcan.wr.usgs.gov/Volcanoes/Rainier/Hazards/OFR98-428/framework.html

Wolfe, E.W. and Pierson, T.C., 1995, Volcanic-Hazard Zonation for Mount St. Helens, Washington, 1995: USGS Open-File Report 95-497. Online: http://vulcan.wr.usgs.gov/Volcanoes/MSH/Hazards/OFR95-497/framework.html

Scott, W.E., Pierson, T.C., Schilling, S.P., Costa, J.E., Gardner, C.A., Vallance, J.W. and Major, J.J., 1997, Volcano Hazards in the Mount Hood Region, Oregon: USGS Open-File Report 97-89. Online: http://vulcan.wr.usgs.gov/Volcanoes/Hood/Hazards/OFR97-89/framework.html

Hoblitt, R.P., Miller, C.D., and Scott, W.E., 1987, Volcanic Hazards with Regard to Siting Nuclear-Power Plants in the Pacific Northwest: USGS Open-File Report 87-297. Online: http://vulcan.wr.usgs.gov/Hazards/NRC_Definitions/tephra.html

Further information regarding the volcanoes of the Cascade Range and the hazards associated with volcanic events can be obtained via the Internet from:

USGS Cascades Volcano Observatory
http://vulcan.wr.usgs.gov/

USGS Volcano Hazards Program
http://volcanoes.usgs.gov/

USGS Fact Sheet on Volcanic Ash Hazards
http://geopubs.wr.usgs.gov/fact-sheet/fs027-00/fs027-00.pdf

Pamphlet on Ash Hazards
http://emd.wa.gov/3-map/mit/eq-tsunami/vol-ash-english.pdf (English version)
http://emd.wa.gov/3-map/mit/eq-tsunami/vol-ash-spanish.pdf (Spanish version)

Volcanic Ash Effects and Mitigation
Report prepared in 1983 for the Air Force Office of Scientific Research and the Defense Advanced Research Projects Agency, Prepared by: John R. Labadie

Mitigation Goals and Initiatives

Mitigation Goals
The goals and objectives, which guided the development of the plan, are intended to be implemented in the community by the year 2025. Each goal statement has objectives that provide a more specific framework for actions to be taken by the planning partners. The objectives define actions or results that can be placed into measurable terms, and translated into specific assignments for implementation. They also guide the development of proposed mitigation initiatives in this section. Each mitigation initiative corresponds to a specific goal and objective which that action seeks to implement.

The following are the goals and objectives for the hazard mitigation plan:

1. Prevent loss of life and injuries
    A. Provide the highest degree of natural protection at the least cost by working with natural systems and using prevention as a first priority.
    B. Ensure there are adequate systems in place to provide emergency instructions during a disaster.
    C. Rely upon a combination of state, or federal grants and locally generated funds (for the required match) to implement most mitigation initiatives.
2. Reduce property damage
    A. Design and retrofit essential transportation facilities and systems to minimize the potential for disruption during a disaster.
    B. Design and retrofit essential water and sewer services to minimize the potential for disruption during a disaster.
    C. Encourage private sector hazards mitigation planning for the design and retrofit of energy and telecommunications infrastructure to minimize the potential for the disruption during a disaster.
    D. Support key employers in the community to implement mitigation measures for their facilities and systems.
3. Educate the public on the potential hazards, disaster preparedness, response and mitigation strategies
    A. Develop and implement education programs which explain the vulnerabilities and risks of natural hazards in Grant County, and ways to reduce their personal vulnerability to those hazards.
    B. Develop and implement education programs which explain the mitigation initiatives to be undertaken by various communities in Grant County.
    C. Develop and implement education programs for appropriate local governmental employees that explain the mitigation initiatives to be undertaken in Grant County.
4. Improve hazard assessment information and data.
    A. Provide the highest degree of natural hazards protection at the least cost by working with natural systems and using prevention as a first priority.
    B. Ensure there are adequate systems in place to provide emergency instructions during a disaster.
    C. Rely on a combination of state, or federal grants and locally generated funds (for the required match) to implement most mitigation initiatives.

5. Preserve and protect natural systems and the environment.
    A. Ensure that historical assets in the community are protected from hazard events
    B. Protect valuable waterways and aquifers to insure that communities have clean potable water
    C. Protect farmland's soils from contamination and erosion
6. Incorporate hazard mitigation initiatives into local and regional policies, plans, and regulations
    A. Integrate the mitigation initiatives from the hazard mitigation plan into local government's comprehensive plans, development regulations, and Capital Improvement Plans (CIPs).
    B. Adopt Critical Area Ordinance (CAO) regulations which prohibit the location of inappropriate land uses within areas of high risk, and require mitigation measures when structures of facilities are allowed in areas of less risk.
    C. Adopt and enforce the most recent version of the Uniform Building Code (UBC) along with its chapters as a way to address wind, fire, landslide, and earthquake hazards.
    D. Adopt land use designations, comprehensive plan policies, and development regulations which minimize new development within high hazard areas.
    E. Locate new facilities outside areas vulnerable to the impacts of natural hazards. Where this is not feasible, design these facilities so they can withstand the impacts of a disaster.
    F. Minimize the vulnerability that libraries, museums, and other institutions import to the daily lives of the community.
7. Enhance participation in the multi-jurisdictional hazard mitigation planning process.
    A. Local governmental entities are encouraged and can choose to participate in the planning process.
    B. Promote hazards mitigation planning between local government entities, the business community, and volunteer organizations.
    C. Update the hazards mitigation plan on a regular basis, and as needed after a disaster event.
    D. Alert the community to the next update cycle of the hazard mitigation plan, and how they might become involved in that planning process.
8. Support regional efforts relating to emergency preparedness, disaster response, and hazard mitigation.
    A. Maintain existing data as well as gather new data and information needed to define hazards, risk areas, and vulnerabilities in Grant County.
    B. Update the natural hazards mitigation plan on a regular basis, and as needed after a disaster event.
    C. Undertake an evaluation by 2010 (during the second planned update cycle) to determine the effectiveness of mitigation initiatives implemented in Grant County.
9. Maintain essential services, facilities, and infrastructures.
    A. Ensure that local emergency services have the capability to detect emergency situations and promptly initiate emergency response options.
    B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.

C. Ensure that utility and communications systems supporting emergency services operations can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
D. Prioritize the reopening of vehicle access routes to evacuation shelters and key health care facilities after a disaster.
E. Encourage private sector hazards mitigation planning for the design and retrofit of energy and telecommunications infrastructure to minimize the potential for disruption during a disaster.
F. Support key employers in the community to implement mitigation measures for their facilities and systems.
G. Provide the highest degree of natural hazards protection at the least cost by working with existing systems and using prevention as a first priority.
H. Ensure there are adequate systems in place to provide emergency instructions during a disaster.
I. Rely upon a combination of state, or federal grants and locally generated funds (for the required match) to implement most mitigation initiatives.

Mitigation Initiatives
Mitigation initiatives are the central piece in the Multi-jurisdictional Hazard Mitigation Plan for Grant County. It is through the implementation of these initiatives that the communities of within Grant County will truly become disaster resistant.

The term "mitigation initiative" is a relatively new addition to the lexicon of hazard management. For the purposes of this document, mitigation initiatives are defined as activities designed to reduce or eliminate losses resulting from natural hazards. These are the initiatives that the participating jurisdictions and organizations would implement when resources become available to do so.

Preparation of Mitigation Initiatives
The mitigation initiatives were prepared by the members of the Planning Committee. Each member of the committee represented their entity and was responsible for gathering and coordinating the information required for their jurisdictional initiatives. A byproduct of the regional multi-disciplinary planning group activities was the cooperative development of regional initiatives that benefited more than one area entity. In most cases, each committee member either had sufficient information to form their own initiative(s) independently or they coordinated with staff in their jurisdictions that were most familiar with the facility, system, or geographic area being addressed. For each initiative, a local mitigation initiative template was prepared.

In addition to the basic statement explaining the mitigation initiative, the template required additional information regarding rationale, estimated cost, potential funding source(s), as well as prioritization within all the mitigation initiatives from that governmental entity. The template also identified who would implement the mitigation initiative when resources become available to do so.
Many of the initiatives underwent a benefit to cost analysis using the Mitigation 20/20™ software provided by the State. A benefit to cost ratio is a comparison of financial benefits of

the initiative to its cost. It is important to identify those initiatives where it would be more cost effective to undertake the action than to continue to pay out damage claims. While it is possible to generate both a preliminary and final benefit to cost ratio using the software, only the final ratio has been listed.
Mitigation 20/20™ was also used to establish a priority score for some projects based on the availability of the data necessary to complete the analysis. "Priority score" is a term from the software that provides a long-term characterization value for each mitigation initiative based on its own merits.
Again, these factors, "cost/benefit" and "priority score", should only be considered "rough" in nature until the data used as a basis for them is better defined by a recent comprehensive analysis (as would be needed for a pre- or post-disaster mitigation project grant application). The actions should be implemented with available funding at the local level first, if funding is inadequate or unavailable, other available funds, such as government grants may be used if approved.

All of the initiatives were prioritized by staff within the participating jurisdictions/special purpose districts based upon factors relevant to their local condition. Relative risk assessment scores varying from region to region may also be used. Some priorities were pre-determined through capital facilities or comprehensive plans.

Categories of Mitigation Initiatives
The mitigation initiatives were grouped into seven general categories as follows:

- Public Information
- Plan Coordination and Implementation
- Data Collection and Mapping
- Development Regulations
- Hazard Preparedness
- Hazard Damage Reduction
- Critical Facilities Replacement/Retrofit

The term "Public Information" covers all types of educational information that would be beneficial to either avoid hazards or deal with their effects. The term "Plan Coordination and Implementation" is used for any activity that supported the planning process or relates to the implementation of the plan within that entity. The term "Data Collection and Mapping" relates to the process of gathering and analyzing new data and then mapping that information so that it can be used for risk assessment. The term "Development Regulations" relates to the preparation of local regulations to assess these hazards. "Hazard Preparedness" refers to a rather broad list of activities which would take place before an event to prepare for a disaster. This contrasts with "Hazard Damage Reduction" initiatives, which are any activity that would lessen the damage of a disaster event and which is not for a critical facility. The term "Critical Facilities Replacement/Retrofit" indicates those initiatives targeted at improving or replacing critical facilities.

Identification Number for Mitigation Initiatives

A numbering system for the initiatives was devised for use in this plan. It has incorporated abbreviations for three factors - the name of the entity, the type of hazard, and a number (1, 2, 3). For example, the second storm initiative by the City of Moses Lake would be "ML-SH 2". There is no ranking or priority associated with this number. The term "County Wide" was used for initiatives which applied to all jurisdictions and would be adopted with the plan. The term "Multi-Hazard" was used where the initiative would apply to more than one hazard type.

The following outlines the abbreviations for the planning partners:

Town of Coulee City = CC
Town of Electric City = EC
City of Ephrata = E
City of Grand Coulee = GC
Town of George = TG
Town of Hartline = TH
Town of Krupp = K
Town of Mattawa = M
City of Moses Lake = ML
City of Quincy = Q
City of Royal City = RC
City of Soap Lake = SL
City of Warden = W
Town of Wilson Creek = WC
Hospital District #5 = HD5
Hospital District #6 = HD6
Coulee-Hartline School District = CHSD
Ephrata School District = ESD
Grand Coulee Dam School District = GCSD
Moses Lake School District = MLSD
Quincy School District = QSD
Soap Lake School District = SLSD
Wahluke School District = WSD
Wilson Creek School District = WCSD

County Wide = CW
Grant County = GC
Grant County Emer. Mgmt. = GCEM
Grant County Planning Dept. = GCP
Grant County Sheriff's Office = GCSO
Grant County PUD = GCPUD
Fire Protection District #3 = FD3
Fire Protection District #4 = FD4
Fire Protection District #7 = FD7
Fire Protection District #8 = FD8
Fire Protection District #10 = FD10
Fire Protection District #12 = FD12
Fire Protection District #6 = FD6
Port of Hartline = PH
Port of Mattawa = PM
Port of Moses Lake = PML
Port of Royal Slope = PRS
Port of Warden = PW
Port of Ephrata = PE

Mitigation Initiatives by Entity

The mitigation initiatives for each entity are provided in the following section. They are grouped by jurisdiction/special purpose district beginning with the county-wide initiatives and then alphabetically by entity. Each group of initiatives lists initiatives by hazard category in the order indicated above.

The mitigation initiative templates contain detailed information for each initiative broken down as follows:

- The term "Governmental Entity" refers to jurisdiction or special purpose district which proposed the mitigation initiative. The term "County Wide" was used for initiatives which applied to all governmental entities participating in this plan.
- The field "Hazard Type" refers to earthquake, flood, landslide or storm hazards. When one or more hazards could apply, the term "Multi-Hazard" was used.

- “Category” refers to the type of initiative (e.g. Public Information, Plan Coordination and Implementation, etc.)
- “Priority” is the prioritization which the entity has chosen (1 of 10, 2 of 3, 5 of 5, etc.).
- The top shaded box contains the "Identification Number" and the complete text of the mitigation initiative.
- In the bottom shaded box is the "Rationale" for the initiative and contains important background information.
- The fields entitled “Relates to HMP (Hazard Mitigation Plan) Goals” and “HMP Objectives” denote the links between the initiative and the goals and objectives for this plan.
- The term “Implementer” is that department or section of the entity responsibility for implementing the initiative.
- Next is the “Estimated Costs” of the initiative.
- “Time Period” refers to when the entity believes it will be able to accomplish the initiative. This is usually from one to twenty years.
- The term “Funding Source” indicates how the entity plans to fund the initiative.

Some of the initiatives have been previously adopted into other plans and the following fields give information regarding where further information may be accessed on the initiative. Where there was no previous adoption of the initiative, the following three terms were eliminated from the form.

- The field “Source & Date” refers to a reference for the mitigation initiative.
- The term “Adopted Plan #” refers to the identifier of the initiative within the adopted document.
- “Reference Page” refers to the page which the initiative can be found in the adopted document.

Other important factors on each mitigation initiative were derived from the Mitigation 20/20™ software. Data is only available when the governmental entity filled out the abbreviated data entry form or completed the Mitigation 20/20™ Mitigation Initiative Characterization Form. “Priority Score” is a term from the Mitigation 20/20™ software which describes a long term characterization value, which is directly associated with each initiative based on its own merits. This value serves as a guideline of relative desirability of a specific mitigation initiative in relation to the other initiatives incorporated into the plan by the submitting entity.

A “Final Benefit to Cost Ratio” is a comparison of financial benefits of the initiative to its cost. It is important to identify those initiatives which it would be more cost effective to undertake the action than to continue to pay out damage claims. While the Mitigation 20/20™ software generates both a preliminary and a final benefit to cost ratio, only the final ratio was listed.

Grant County

Municipal Area	Participating Jurisdiction
Grant County Unincorporated	Department of Emergency Management
	Planning Department
	Public Works
	Sheriff's Office
	Port of Moses Lake

The purpose of this section of the plan is to assess the vulnerability of the unincorporated portions of Grant County in regards to the various hazards previously identified in Chapter 2 of this plan. In addition, mitigation strategies that are currently in place relating to these hazards as well as newly proposed mitigation strategies have been included in this section of the plan. To complete the vulnerability assessment process, various county staff utilized a series of forms available in the 20/20 Mitigation Software. The information collected with these forms is included in this portion of the plan.

As part of the vulnerability assessment process, Grant County officials completed an inventory of all critical facilities and have considered these critical facilities in their planning and mitigation strategy development process. *At this point, the planning process has identified over 200 critical facilities in Grant County.* However, due to post 9/11 concerns, those facilities are not listed in this document. In addition, further action will be taken to document these facilities with both photographs and Global Positioning System (GPS) coordinates in a Geographical Information Services (GIS) mapping. A list of these facilities will be made available to FEMA personnel in the event this information is required to obtain future hazard mitigation grant funding.

Representatives from Grant County government worked closely with other agencies and Grant County Emergency Management staff to develop a comprehensive, coordinated mitigation plan intended to reduce the vulnerability to hazards within the unincorporated portions of Grant County. This document presents the results of this effort to identify the specific hazards threatening Grant County and to identify current as well as proposed mitigation strategies, projects and/or programs to address identified vulnerabilities.

The assessment is based on the currently available information and data regarding the characteristics of the neighborhoods identified, the hazards that threaten the people, property, and environment of these neighborhoods as well as the impacts these neighborhoods have suffered in past disasters. This information includes, when available, United States Census data, local tax records, local and national geographic information system data, Flood Insurance Rate Map information, hazard specific analyses, and other environmental and demographic facts.

However, very often authoritative or current information simply was not available for the planning effort. In these cases, the experience, knowledge and judgment of local officials representing Grant County government were used in the planning, including assumptions and approximations that were believed to be reasonable. In addition, straight-forward, simplified technical analyses were used for tasks such as estimating property values, determining the size of populations affected, and so forth. The reliance on the judgment of knowledgeable officials and simplified analyses is considered acceptable at this stage to allow the participating organizations to complete the tasks needed to develop this multi-jurisdictional

hazard mitigation plan. As the planning continues in future years, or at the time when a proposed mitigation initiative is intended to be funded and/or implemented, the participating organizations/jurisdictions recognize that additional information and analyses may be required. Grant County government is committed to the implementation of the mitigation-related projects/programs described in this section of the plan when and if resources become available. Grant County government is also committed to continuing the mitigation planning process that has resulted in the development of this document, and to the ongoing cooperation with other agencies, organizations, and jurisdictions to make Grant County more resistant to the damages and hardships that could otherwise be the result of future disasters.

Grant County Overview

Contact Information:
Grant County
P.O. Box 37
Ephrata, Washington 98823
Telephone: (509) 754-2011
Population of Jurisdiction: 76,000 and increasing slightly
Principal Economic Base: Agricultural
Economic Characteristic: Economically disadvantaged
Current Hazard Mitigation Codes/Plans/Ordinances:

- Comprehensive Land Use Plan
- Adopted Land Use/Zoning Code
- Adopted Fire Safety Code (Universal Fire Code)
- Adopted Building Code (State-approved 1997 Uniform Building Code)
- Participation in NFIP Program

Jurisdiction-Specific Vulnerability Assessment & Mitigation Strategies

Grant County Current Land Uses and Potential for New Development

40 percent (1064 square miles) of the jurisdiction remains to be developed. This is both land that is vacant or part of a larger parcel that is partially developed.

Current Land Use Category	Percent of Jurisdiction
Agricultural	71%
Commercial	1%
Industrial	1%
Residential	13%
Vacant/unused - government ownership	13%
Other	1%

Future Land Use

The current rate of new development of vacant or unused land is occurring rapidly or somewhat faster than planned.

The current rate of expansion, reconstruction or redevelopment of existing properties is occurring in some

properties in a few locations.

Development/Redevelopment Currently Controlled By:

- A building code (1997 State-approved UBC)
- A land use plan
- A zoning code
- Hazard-specific ordinance: Floods
- Hazard-specific ordinance: Geologic Hazards
- Aquifer protection ordinance

In response to increased pressures from unprecedented population growth in Washington State, the State Legislature passed the Growth Management Act. The Growth Management Act (GMA) (RCW 36.70A) is intended to avoid the possibility of uncoordinated and unplanned growth inherent in anticipated population increases. It requires county and city governments to adopt locally-derived plans and regulations around a basic framework of issues defined by the state legislature. One of the primary intents of the GMA is to promote wise use of natural resource and protect critical areas in accommodating urban growth. Each jurisdiction must classify and designate their resource lands and critical areas, and each must adopt development regulations for their critical areas. In addition, some jurisdictions must adopt planning policies and comprehensive plans that address many aspects of urban growth and development that are expected to occur in the county, including land use, housing, utilities, transportation, and others. Subsequent amendments to the GMA require that counties and cities include the best available science in developing policies and development regulations to protect the functions and values of critical areas.

A comprehensive plan is a legal document adopted by local elected officials establishing policies that will guide the future development, growth, and land use within the counties over the next 20 years. The Plans strive to maintain the uniqueness of each area/community and enhance the existing quality of life that comes from a sense of community, customs, economic progress, open spaces, aesthetic/scenic beauty, recreational opportunities, clean air and water, abundant fish and wildlife, healthy ecosystems, historical and cultural resources, and increased access to land and water resources. In addition, the Plans provide for expansion of these opportunities, while maintaining an adequate infrastructure to accommodate this growth.
The Plans provide for the protection of critical areas, which include the following areas and ecosystems: (a) wetlands; (b) groundwater resources and aquifer recharge areas; (c) fish and wildlife habitat conservation areas; (d) frequently flooded areas known to be critical parts of the natural drainage system; and (e) geologically hazardous areas. The land use element is also required by the GMA to review, where applicable, drainage, flooding, and storm water run-off and to provide guidance for corrective actions to mitigate those discharges that pollute waters of the state.

The rate of Grant County population growth over the last decade has approximated 3% a year and that rate is expected to continue under GMA projections.

According to studies commissioned by Grant County in 1999, the total population in Grant County is expected to increase from 69,400 people in 1998 to 106,362 people in 2018, for a net increase of 36,962 people over the 20-year planning period. Of that growth, 32,796 or 89% is expected to occur in Urban Growth Areas, and 4,166 or 11% in rural lands. In 2018, the total County population of 106,362 is expected to be distributed as 77,144 people residing in UGAs and 29,218 in all rural lands combined.

Grant County Rural Land Use Analysis: Population, Housing and UGA Land Allocations (Proulx Cearns, Inc., September 1999) See Appendix A.

Comparison of Jurisdictional Relative Risk: Grant County Composite

Hazard	Probability of Occurrence	Impacted Area	Health & Safety Impacts	Property Impacts	Environmental Impacts	Economic Impacts	Total Hazard Rating
Natural	Total Natural Hazard Risk Rating: **358**						
Drought	4	4	1	1	1	2	**36**
Earthquake	4	2	1	1	0	1	**14**
Flooding	2	4	1	2	1	1	**28**
Hail	2	5	0	1	2	1	**30**
High Winds	4	5	2	2	3	2	**65**
Infestation, Disease	4	2	2	1	1	1	**18**
Landslide, Erosion	2	2	1	1	1	1	**12**
Lightning	4	5	1	1	0	1	**35**
Major Fire – Urban	1	4	1	2	1	1	**24**
Major Fire – Wildland	2	4	1	1	1	1	**24**
Severe Winter Storm	4	5	1	2	1	1	**45**
Volcano Activity	4	3	1	1	1	2	**27**
Technological	**Total Technological Hazard Risk Rating:** 106						
Civil Disturbance	3	0	1	1	0	1	**9**
Communications	1	1	2	2	0	2	**7**
Hazardous Materials	3	1	1	1	1	1	**18**
Loss of Electrical	5	1	1	0	0	1	**15**
Loss of Gas / Fuel	1	1	0	2	0	1	**4**
Loss of Sewer	1	0	0	0	0	0	**0**
Loss of Water	1	0	0	0	0	0	**0**
Radiological	1	0	1	2	0	2	**6**
Special Hazards	3	1	1	1	1	1	**15**
Transportation	4	2	2	1	1	1	**28**
Total Relative Risk: **464**							

Note: See table below for explanation of ratings.

Impact Area		*Probability of Occurrence*		*Health & Safety Impacts*	
0	No developed area impacted	1	Unknown but rare occurrence	0	No Health and Safety impact
1	Less that 25% of developed areas impacted	2	Unknown but anticipate an occurrence	1	Few injuries/illnesses
2	Less than 50% of developed area impacted	3	100 years or less occurrence	2	Few fatalities but many injuries/illnesses
3	Less than 75% of developed area	4	25 years or less occurrence	3	Numerous fatalities

	impacted				
4	Over 75% of developed area impacted	5	Once a year or more occurrence		

Property Impacts		*Environmental Impacts*		*Economic Impacts*	
0	No property damage	0	Little or no environmental damage	0	No economic impact
1	Few properties destroyed - few properties damaged	1	Resources damaged with short term recovery practical	1	Low direct and/or low indirect costs
2	Few destroyed - many damaged	2	Resources damaged with long term recovery feasible	2	High direct & low indirect costs
2	Few damaged - many destroyed	3	Resources destroyed beyond recovery	2	Low direct & high indirect costs
3	Many properties destroyed and damaged			3	High direct && high indirect costs

Property at Risk

To make jurisdiction-wide analysis of the dollar value of properties at risk for each hazard type feasible and practical for mitigation planning purposes, a simplified approach has been used. The estimate of the dollar value of properties at risk for specific hazards is accomplished in the following manner: The number of structures in a specific neighborhood and the average dollar value for those structures is estimated by local planners, based on readily available data or their best judgment in the absence of suitable data. The percentage of the specific neighborhood threatened by the identified hazard is then estimated by local planners, again based on readily available data or their best judgment. The percent of the neighborhood at risk is then used as a multiplier to determine the estimated number of structures at risk from that hazard. This number is then multiplied by the estimated average cost of the structures to derive an estimated total value of the property at risk of damage in that neighborhood from the identified hazard.

(Note: In many cases the median value was used from recent census data when the average value was not readily available. This average value of the residences in a neighborhood somewhat undervalues the property at risk.) The methodology is simplistic but conservative in that it assumes structures are uniformly distributed throughout the neighborhood in relation to the area of risk that the hazard threatens the entire value of each structure, and that structures are equally vulnerable to the impacts of the hazard. The derived estimates for the dollar value of property at risk may therefore be higher than would actually be the case, but the estimates are considered satisfactory to support the local mitigation planning process.

People at Risk

The estimated total populations for each neighborhood by jurisdiction are given in the table below which are determined by local planners through readily available data or their best judgment in the absence of suitable data. If a person wanted to determine the percentage of the population at risk in a particular neighborhood, the following method should be used: multiply the percent of structures at risk by the total estimated neighborhood population. The methodology is simplistic but conservative in that it assumes occupied structures are uniformly distributed throughout the neighborhood in relation to the area of risk, that the population is present on a 24 hour, 7 day basis, and that all individuals are equally vulnerable to the impacts of the hazard event. Therefore, an estimation of the percentage of a population at risk may be higher than is actually the case, but is considered satisfactory to support the local mitigation planning process.

Grant County
Mitigation 20/20 Task ™
Estimated Value of Structures at Risk, by

	Use	Estimated Number Of Structures	Average Value of Each Structure	Percent of Structures at Risk	Total Estimated Value ($) of Structures at Risk
Grant County					
(Unincorporated)					
Hazard Civil Disturbance					
Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	20%	$238,800,000
Hazard Drought					
Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	100%	$1,194,000,000
Hazard Earthquake					
Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	100%	$1,194,000,000
Hazard Flooding					
Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	10%	$119,400,000
Hazard Hail					
Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	100%	$1,194,000,000
Hazard Hazardous Materials					
Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	75%	$895,500,000
Hazard High Winds					
Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	100%	$1,194,000,000
Hazard Infestation, Disease					
Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	100%	$1,194,000,000
Hazard Landslide, Erosion					
Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	5%	$59,700,000
Hazard Lightning					

Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	100%	$1,194,000,000

Hazard Loss of Electrical Service

Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	100%	$1,194,000,000

Hazard Loss of Gas Service

Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	90%	$1,074,600,000

Hazard Loss of Sewer Service

Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	10%	$119,400,000

Hazard Loss of Water Service

Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	10%	$119,400,000

Hazard Major Fire - Urban

Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	40%	$477,600,000

Hazard Major Fire -Wildland

Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	100%	$1,194,000,000

Hazard Radiological

Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	15%	$179,100,000

Hazard Severe Winter Storm

Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	100%	$1,194,000,000

Hazard Special Hazards

Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	35%	$417,900,000

Hazard Telecommunications

Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	100%	$1,194,000,000

Hazard Transportation

Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	75%	$895,500,000

Hazard Volcano Activity

Neighborhood Name					
Grant County Unincorporated	Mixed Use	12000	$99,500.00	100%	$1,194,000,0

The below list of all Taxing Districts in Grant County (Includes the value of all types of property, residential, commercial, farmland, etc.**)**

Levies for 2004 Taxes

District	Assessed Value	Levy Rate	Total Levy Rate	Levy	Total Levy
State School	4,217,333,284	2.75835		11,632,881	
State School Refund	4,217,333,284	0.00045	2.75880	1,898	11,634,779
County					
District	**Assessed Value**	**Levy Rate**	**Total Levy Rate**	**Levy**	**Total Levy**
County Current Expense	4,304,166,669	1.76375		7,591,474	
County Mental Health	4,304,166,669	0.02500		107,604	
County Veterans Relief	4,304,166,669	0.01125	1.80000	48,422	7,747,500
County Road					
District	**Assessed Value**	**Levy Rate**	**Total Levy Rate**	**Levy**	**Total Levy**
Roads	2,583,155,716	2.2500	2.2500	5,812,100	5,812,100
Library					
District	**Assessed Value**	**Levy Rate**	**Total Levy Rate**	**Levy**	**Total Levy**
Library	3,890,355,529	0.5000	0.5000	1,945,178	1,945,178
Municipalities					
District	**Assessed Value**	**Levy Rate**	**Total Levy Rate**	**Levy**	**Total Levy**
Coulee City	21,302,564	3.0393		64,745	
Coulee City Bond (Fire)	20,384,489	0.8733	3.9126	17,802	82,547
Coulee Dam	1,024,950	2.9045	2.9045	2,977	2,977

Electric City	28,441,161	2.8627	2.8627	81,419	81,419
Ephrata	266,668,363	3.2045	3.2045	854,539	854,539
George	8,748,338	1.8229		15,947	
George Refund	8,748,338	0.0043	1.8272	38	15,985
Grand Coulee	28,404,010	2.9638	2.9638	84,184	84,184
Hartline	3,410,872	3.3750	3.3750	11,512	11,512
Marlin	2,825,152	3.3750	3.3750	9,535	9,535
Mattawa	38,473,338	2.2931	2.2931	88,223	88,223
Moses Lake	867,122,847	2.9462	2.9462	2,554,717	2,554,717
Quincy	260,022,600	3.0957		804,952	
Quincy Bond (G&O)	256,716,805	0.9291		238,516	
Quincy Refund	260,022,600	0.0043	4.0291	1,118	1,044,586
Royal City	26,162,226	1.8883	1.8883	49,402	49,402
Soap Lake	48,800,343	2.3311	2.3311	113,758	113,758
Warden	114,363,002	2.4498	2.4498	280,166	280,166
Wilson Creek	5,241,187	3.3750	3.3750	17,689	17,689
Hospital Districts					
District	**Assessed Value**	**Levy Rate**	**Total Levy Rate**	**Levy**	**Total Levy**
Hospital #1	2,115,579,243	0.5000	0.5000	1,057,790	1,057,790
Hospital #2	774,882,508	0.5000		387,441	
Hospital #2 Bond (G&O)	769,197,092	0.2382		183,223	
Hospital #2 Bond (M&O)	769,197,092	1.7551	2.4933	1,350,018	1,920,682
Hospital #3	494,237,731	0.5000		247,119	
Hospital #3 Bond (G&O)	485,322,778	0.7246	1.2246	351,665	598,784
Hospital #4	259,558,008	0.5000	0.5000	129,779	129,779
Hospital #5	327,485,692	0.5000	0.5000	163,743	163,743
Hospital #6	114,605,761	0.5000		57,303	
Hospital #6 Bond (G&O)	112,340,046	0.4007	0.9007	45,015	102,318
Hospital #7	216,262,054	0.5000	0.5000	108,131	108,131
Cemetery Districts					
District	**Assessed Value**	**Levy Rate**	**Total Levy Rate**	**Levy**	**Total Levy**

Cemetery #1	715,322,542	0.0000	0.0000	0	0
Cemetery #2	25,662,326	0.0000		0	
Cemetery #2 Special	25,439,076	0.1966	0.1966	5,001	5,001
Cemetery #3	36,768,733	0.0000	0.0000	0	0
Cemetery #4	226,702,439	0.0000	0.0000	0	0
Cemetery #5	224,333,212	0.0000	0.0000	0	0
Park And Recreation Districts					
District	**Assessed Value**	**Levy Rate**	**Total Levy Rate**	**Levy**	**Total Levy**
Park & Rec #1	210,742,629	0.0000	0.0000	0	0
Park & Rec #2	40,170,110	0.0000	0.0000	0	0
Fire Districts					
District	**Assessed Value**	**Levy Rate**	**Total Levy Rate**	**Levy**	**Total Levy**
Fire #3	496,889,668	0.8500		422,356	
Fire #3 EMS	496,889,668	0.2500	1.1000	124,222	546,578
Fire #4	229,913,362	0.8500		195,426	
Fire #4 EMS	229,913,362	0.2419	1.0919	55,616	251,042
Fire #5	988,462,754	0.8500	0.8500	840,193	840,193
Fire #6	39,386,497	0.8500	0.8500	33,479	33,479
Fire #7	116,804,437	0.8500	0.8500	99,284	99,284
Fire #8	276,545,540	0.8500		235,064	
Fire #8 EMS	276,545,540	0.2216	1.0716	61,282	296,346
Fire #10	196,789,197	0.8500		167,271	
Fire #10 EMS	196,789,197	0.2308	1.0808	45,419	212,690
Fire #11	122,721,513	0.8500		104,313	
Fire #11 EMS	122,721,513	0.2254	1.0754	27,661	131,974
Fire #12	47,210,429	0.8500	0.8500	40,129	40,129
Fire #13	87,875,369	0.8500	0.8500	74,694	74,694
Fire #14	19,557,421	0.8500	0.8500	16,624	16,624
Fire #15	94,887,531	0.8500	0.8500	80,654	80,654

School Districts					
District	**Assessed Value**	**Levy Rate**	**Total Levy Rate**	**Levy**	**Total Levy**
School #73 M&O	313,746,887	3.5061		1,100,028	
School #73 Bond	313,746,887	1.4981	5.0042	470,024	1,570,052
School #144 M&O	694,974,196	2.7705		1,925,426	
School #144 Bond	694,974,196	1.9039	4.6744	1,323,161	3,248,587
School #146 M&O	222,243,581	2.4766		550,408	
School #146 Bond	222,243,581	1.4894	3.9660	331,010	881,418
School #151 M&O	93,195,700	2.6370		245,757	
School #151 Bond	93,195,700	2.1096	4.7466	196,606	442,363
School #156 M&O	112,990,849	3.5490		401,005	
School #156 Bond	112,990,849	2.0799	5.6289	235,010	636,015
School #158 M&O	8,262,270	3.3010		27,274	
School #158 Bond	8,262,270	0.0000	3.3010	0	27,274
School #160 M&O	324,741,372	1.9708		640,000	
School #160 Bond	324,741,372	1.7430	3.7138	566,024	1,206,024
School #161 M&O	1,903,128,745	3.3628		6,399,841	
School #161 Bond	1,903,128,745	1.4713	4.8341	2,800,073	9,199,914
School #163 M&O	26,453	2.6570		70	
School #163 Bond	26,453	1.5215	4.1785	40	110
School #165 M&O	454,314,192	4.7593		2,162,218	
School #165 Bond	454,314,192	0.8971	5.6564	407,565	2,569,783
School #166 M&O	10,297,095	3.3151		34,136	
School #166 Bond	10,297,095	0.5894	3.9045	6,069	40,205
School #167 M&O	38,644,703	4.0769		157,551	
School #167 Bond	38,644,703	2.3982	6.4751	92,678	250,229
School #301 M&O	74,931,880	5.2719		395,033	
School #301 Bond	74,931,880	0.0000	5.2719	0	395,033
Port Districts					
District	**Assessed Value**	**Levy Rate**	**Total Levy Rate**	**Levy**	**Total Levy**

Port #1	819,444,867	0.3391	0.3391	277,874	277,874
Port #2	316,283,618	0.3948	0.3948	124,869	124,869
Port #3	315,018,878	0.4032	0.4032	127,016	127,016
Port #4	66,486,455	0.4252	0.4252	28,270	28,270
Port #5	41,217,541	0.4500	0.4500	18,548	18,548
Port #6	62,716,274	0.4014	0.4014	25,174	25,174
Port #7	77,427,542	0.4165	0.4165	32,249	32,249
Port #8	219,452,140	0.3292	0.3292	72,244	72,244
Port #9	347,086,557	0.4396		152,579	
Port #9 Excess	347,086,557	0.0470	0.4866	16,313	168,892
Port #10	1,837,298,322	0.4303	0.4303	790,589	790,589
Mosquito Districts					
Mosquito #1	1,823,611,225	0.5027	0.5027	916,729	916,729
Mosquito #2	77,427,542	1.0000	1.0000	77,428	77,428
Mosquito #3	30,964,361	1.0500	1.0500	32,513	32,513
Water Districts					
Water District 1	9,248,892	0.0000	0.0000	0	0
Water Beverly	1,057,166	0.0000	0.0000	0	0
Water Royal	1,947,375	0.0000	0.0000	0	0
Crescent Sewer	24,053,975	0.0000	0.0000	0	0
				Total Taxes	61,273,443

Grant County Planning Department

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of the Grant County Planning Department, a natural hazard event such as drought, technological hazards such as hazardous materials are the hazards of concern for our aquifers.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
GCP-MH1	Public Education	Aquifer Protection, Hazardous Waste Management and Disposal	1 of 1	$150,000

Governmental Entity:	Grant County Planning Department
Hazard Type:	Multi-hazard
Initiative Category:	Public Education
Priority:	1 of 1

Initiative Nr: **GCP-MH1**
Increase general awareness of hazardous waste to the public, training for landfill operators, general education about the proper disposal of hazardous waste by businesses and agriculture.

Rationale:
Out urban and agricultural communities are dependent on wells that tap into the generous aquifers for both drinking water and water for crops and orchards. This water resource must be protected from harmful chemicals. Failure to protect this resource will make our communities more vulnerable to droughts that frequently impact this area.

Relates to Plan Goal(s):	5. Preserve and protect natural systems and the environment.
Relates to Plan Objective(s):	5B. Protect valuable waterways and aquifers to insure that communities have clean potable water.
Implementer:	Grant County Planning Department
Estimated Cost:	$150,000

Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	10.71: 1

Grant County Public Works Department

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of Grant County Public Works, hazard events such as severe winter storms, high winds, earthquake, transportation hazards such as road blockage and infrastructure damages preventing access and egress and radiological hazards inherent with the nuclear facilities at Hanford, have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
GCPW-MH1	Other Structural	Saddle Mountain Road Project	1 of 1	$15,500,000

Governmental Entity:	Grant County Public Works
Hazard Type:	Multi-hazard
Initiative Category:	Other structural
Priority:	1 of 1

Initiative Nr: GCPW-MH1
Plan and built additional access road over the Saddle Mountains in Southwest Grant County.

Rationale:
This project would build a new County Road alignment connecting an isolated part of southern Grant County to central Grant County by pushing an alignment over the Saddle Mountains. This would connect the fastest growing but isolated part of the Grant County to the other transportation infrastructure. Currently only one State Highway (SR 243) and no County Roads connect the area just north of the Hanford Nuclear Reservation. This would give another access route to this isolated area.

Relates to Plan Goal(s):	2. Reduce property damage
Relates to Plan Objective(s):	2A. Design and retrofit essential transportation facilities and systems to minimize the potential for disruption during a disaster.
Implementer:	Grant County Public Works
Estimated Cost:	$15,500,000
Time Period:	2006-2010
Funding Source:	Federal Highway Admin (FHWA) Funds, State and local transportation funds
Implementation Status:	New
Final Cost to Benefit Ratio:	3.85: 1

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of Grant County Sheriffs Office (GCSO), natural hazard events such as severe winter storms, high winds and lightning have been selected as the hazards of concern. Technological hazards include but are not limited to hazardous material spills from transportation accidents along the road ways which border the Multi-Agency Communication Center (MACC) and other property and facilities within the operational areas of the GCSO.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
GCSO-MH1	Structure Retrofit	Multi-Agency Com. Center(MACC) Radio Improvements	1 of 1	$7,360,000

Governmental Entity:	Grant County Sheriff's Office
Hazard Type:	Multi-hazard
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: GCSO-MH1

ADCOMM Engineering under MACC's employment reviewed the existing system and made recommendations for improvement. The proposed improvements address specific deficiencies, improve coverage, "Push to talk ID", and narrowband compliance. Deficiencies identified include inadequate grounding at all sites, lack of backup power, several radio site buildings that are not adequately protecting the housed equipment and microwave links that lack backup.

Rationale:
Any number of hazard events both natural or technological, or in combination, have the capacity of rendering the communication center partially or wholly inoperable for short or long periods of time. The communication center does have a backup power generator at the dispatch center and it is located in a location that is free of obvious vulnerabilities. There is also a limited backup facility with the Sheriff's Office. However, the ADCOMM report cites a variety of deficiencies system-wide and at the various communication towers that need to be corrected. These deficiencies may impair the ability to communicate during hazard events placing the public and emergency responders at risk.

Relates to Plan Goal(s):	9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed. 9C. Ensure that utility and communications systems supporting emergency services operations can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	MACC Board of Directors
Estimated Cost:	$7,360,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	4.02: 1

Grant County Emergency Management

Prioritization of Hazards

After a review of the hazards threatening the facilities and systems of Grant County Emergency Management (GCEM) has selected natural hazard events such as severe winter storms, high winds and lightning have been selected as the hazards of concern. The initiatives below will also address all-hazards to include those that are natural and those that are technological.
.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
GCEM-MH1	Hazard Mitigation Planning	Encourage and support LEPCs regionally in Grant County	1 of 4	$50,000
GCEM-MH2	Hazard Preparedness	Improve and maintain support and participation in the Grant County Community Emergency Response (CERT) program.	2 of 4	$2,000
GCEM-MH3	Public Education	Incorporate hazard awareness information into the GCEM public education program.	3 of 4	$2,000
GCEM-MH4	Development Regulations	Establish a buffer zone between industrial and residential properties.	4 of 4	No Cost

Governmental Entity:	Grant County Emergency Management
Hazard Type:	Multi-Hazard
Initiative Category:	Hazard Mitigation Planning
Priority:	1 of 4

Initiative Nr: GCEM-MH1
Encourage and support Local Emergency Planning Committees (LEPC) regionally in Grant County.

Rationale:
Currently there are three functioning Local Emergency Planning Committees (LEPC) within in Grant County. They are Moses Lake, Quincy and one for Grand Coulee/Okanogan/Douglas County area. Through the hazard mitigation planning process two other regions of Grant County appear interested in forming a LEPC. They are the regions around and including:

1. Mattawa/Royal City,
2. Ephrata/Soap Lake

Since the county is composed of numerous smaller regional jurisdictions who commonly work together, and would work intensely together in hazard event, it is advantages to encourage (cont.)regional preparedness, mitigation, response, and recovery planning efforts through

regional LEPCs. Further LEPCs are not only composed of the area municipalities, fire districts and other taxing entities; they are represented by employers, industry, the public, and others. They are a natural multi-disciplinary planning group that could work on neighborhood hazard issues.

Relates to Plan Goal(s):	7. Enhance participation in the multi-jurisdictional hazard mitigation planning process 8. Support regional efforts relating to emergency preparedness, disaster response, and hazard mitigation.
Relates to Plan Objective(s):	7A. Local governmental entities are encouraged and chose to participate in the planning process. 7B. Promote hazards mitigation planning between local government entities, the business community, and volunteer organizations. 7C. Update the hazards mitigation plan on a regular basis, and as needed after a disaster event. 8A. Maintain existing data as well as gather new data and information needed to define hazards, risk areas, and vulnerabilities in Grant County.
Implementer:	Grant County Emergency Management
Estimated Cost:	$50,000
Time Period:	Two years once funding secured
Funding Source:	Local budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	307 : 1

Governmental Entity:	Grant County Emergency Management
Hazard Type:	Multi-Hazard
Initiative Category:	Hazard Preparedness
Priority:	2 of 4

Initiative Nr: GCEM-MH2

Improve and maintain support and participation in the Grant County CERT program.

Rationale:

A major disaster is likely to severely impact the ability of emergency response organizations to handle all of the urgent needs of the people in the affected area. An organization like CERT trains neighbors to help neighbors until professional emergency services personnel can arrive thereby reducing the number of serious injuries and deaths that might occur waiting for emergency responders to arrive.

Relates to Plan Goal(s):	1. Prevent loss of life and injuries 3. Educate the public on the potential hazards, disaster preparedness, response, and mitigation strategies
Relates to Plan Objective(s):	1B. Ensure there are adequate systems in place to provide emergency instructions during a disaster. 3A. Develop and implement education programs which explain the vulnerabilities and risks of natural hazards in Grant County, and ways to reduce their personal vulnerability to those hazards.
Implementer:	Grant County Emergency Management
Estimated Cost:	$2000/year
Time Period:	One year once funding secured
Funding Source:	Local funding
Implementation Status:	New
Final Cost to Benefit Ratio:	571 : 1

Governmental Entity:	Grant County Emergency Management
Hazard Type:	Multi-Hazard
Initiative Category:	Public Education
Priority:	3 of 4

Initiative Nr: GCEM-MH3

Incorporate hazard awareness information into the GCEM public education program.

Rationale:

The more knowledge that residents have about the hazards that face them the more likely they are to take action to safeguard themselves and their property from the affects of these hazards.

Relates to Plan Goal(s):	3. Educate the public on the potential hazards, disaster preparedness, response, and mitigation strategies
Relates to Plan Objective(s):	3A. Develop and implement education programs which explain the vulnerabilities and risks of natural hazards in Grant County, and ways to reduce their personal vulnerability to those hazards. 3B. Develop and implement education programs which explain the mitigation initiatives to be undertaken by various communities in Grant County.
Implementer:	Grant County Emergency Management
Estimated Cost:	$2,000/year
Time Period:	Immediately, ongoing
Funding Source:	Local budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	571:1

Governmental Entity:	Grant County Emergency Management
Hazard Type:	Hazardous Materials
Initiative Category:	Public Education
Priority:	4 of 4

Initiative Nr: GCEM-MH4-Amended July 2007
Improve the hazard awareness and personal protection of citizens within the Wheeler Road corridor planning zone through public education and corporate sponsorship for early warning of hazardous events from the facilities of the Wheeler Road industrial group.

Rationale:
As the City of Moses Lake grows and new industries continue to move to the area, there is a need to protect both the public and the industries that employ many residents from the impacts of hazardous materials incidences.

Relates to Plan Goal(s):	3. Educate the public on the potential hazards, disaster preparedness, response, and mitigation strategies.
Relates to Plan Objective(s):	3A.Develop and implement education programs which explain the vulnerabilities and risks of natural hazards in Grant County, and ways to reduce their personal vulnerability to those hazards. 3B. Develop and implement education programs which explain the mitigation initiatives to be undertaken by various communities in Grant County.
Implementer:	Grant County Emergency Management
Estimated Cost:	No estimated cost at this time
Time Period:	Immediately, ongoing
Funding Source:	Local budget or grants if necessary
Implementation Status:	New
Final Cost to Benefit Ratio:	N/A

Quincy-George Region

Municipal Area	Participating Jurisdiction
Quincy	City of Quincy
	Quincy Schools District #144
	Fire Protection District #3
George	City of George
	Quincy Schools District #144
	George Battalion, Fire Protection District #3

Grant County consists of over sixty taxing districts, including municipalities, port districts, fire districts, and others led, in most cases, by volunteers or part-time officials. These diverse entities, with overlapping jurisdictions, often work regionally to address challenges including those caused by natural and manmade hazards. In the palling process we used regional approaches to identify an area's particular hazards and to assess their regional vulnerability to them. The following Hazard Identification and Vulnerability matrix was developed by the Hazard Mitigation Task Force members from the Quincy-George Region.

The purpose of this section of the plan is to assess the vulnerability to the Quincy-George Region of Grant County in regards to the various hazards previously identified in Chapter 2. In addition, mitigation strategies that are currently in place relating to these hazards as well as newly proposed mitigation strategies have been included in this section of the plan. To complete the vulnerability assessment process, various county staff utilized a series of forms available in the 20/20 Mitigation Software. The information collected with these forms is included in this portion of the plan.

As part of the vulnerability assessment process, officials completed an inventory of all critical facilities and have considered these critical facilities in their planning and mitigation strategy development process. *At this point, the planning process has identified over 200 critical facilities in Grant County.* However, due to post 9/11 concerns, those facilities are not listed in this document. In addition, further action will be taken to document these facilities with both photographs and Global Positioning System (GPS) coordinates in a Geographical Information Services (GIS) mapping. A list of these facilities will be made available to FEMA personnel in the event this information is required to obtain future hazard mitigation grant funding.

Representatives from local government worked closely with other agencies and Grant County Emergency Management staff to develop a comprehensive, coordinated mitigation plan intended to reduce the vulnerability to hazards within the Quincy-George Region of Grant County. This document presents the results of this effort to identify the specific hazards threatening the Quincy-George Region and to identify current as well as proposed mitigation strategies, projects and/or programs to address identified vulnerabilities.

The assessment is based on the best currently available information and data regarding the characteristics of the neighborhoods identified, the hazards that threaten the people, property, and environment of these neighborhoods as well as the impacts these neighborhoods have suffered in past disasters. This information includes, when available, United States Census data, local tax records, local and national

geographic information system data, Flood Insurance Rate Maps, hazard specific analyses, and other environmental and demographic facts.

However, very often authoritative or current information simply was not available for the planning effort. In these cases, the experience, knowledge and judgment of local officials were used in the planning, including assumptions and approximations that were believed to be reasonable. In addition, straight-forward, simplified technical analyses were used for tasks such as estimating property values, determining the size of populations affected, and so forth. The reliance on the judgment of knowledgeable officials and simplified analyses is considered acceptable at this stage to allow the participating organizations to complete the tasks needed to develop this multi-jurisdictional hazard mitigation plan. As the planning continues in future years, or at the time when a proposed mitigation initiative is intended to be funded and/or implemented, the participating organizations/jurisdictions recognize that additional information and analyses may be required. Local government is committed to the implementation of the mitigation-related projects/programs described in this section of the plan when and if resources become available. Local government is also committed to continuing the mitigation planning process that has resulted in the development of this document, and to the ongoing cooperation with other agencies, organizations, and jurisdictions to make Grant County more resistant to the damages and hardships that could otherwise be the result of future disasters.

Quincy-George Overview

City of Quincy

Contact Information:
Dick Zimbelman, Mayor
P.O. Box 338
Quincy, Washington 98848
Telephone: (509) 787-3523
Population of Jurisdiction: 5,255 and increasing slightly
Principal Economic Base: Agricultural
Economic Characteristic: Economically disadvantaged

Jurisdiction-Specific Vulnerability Assessment & Mitigation Strategies

Current Hazard Mitigation Codes/Plans/Ordinances:

- Adopted Land Use/Zoning Code
- Adopted Building Code (International Building Code)
- Washington Survey and Rating Bureau (WSRB) 6

Quincy Current Land Uses and Potential for New Development

Current Land Use Category	Percent of Jurisdiction
Commercial	10 %
Industrial	40 %
Institutional	10 %
Parks/restricted wild land/wildlife refuge	5 %

Residential 35 %

35% of the City of Quincy is still open to development. Development of vacant/unused land is occurring rapidly or somewhat faster than planned and the expansion, development or construction of existing properties is occurring to some properties in a few locations.

City of George

Contact Information:
Elliott Kooy, Mayor
P.O. Box 5277
George, WA 98824
Telephone: (509) 785-5081
Population of Jurisdiction: 540 and increasing slightly
Principal Economic Base: Agricultural
Economic Characteristic: Economically disadvantaged

Jurisdiction-Specific Vulnerability Assessment & Mitigation Strategies

Current Hazard Mitigation Codes/Plans/Ordinances:

- Comprehensive Land Use Plan
- Adopted Land Use/Zoning Code
- Adopted Building Code (BC 2004)
- Adopted fire or other life safety code

60% of the City of George is still open to development. Little or no development is occurring and expansion, development or construction of existing properties is occurring to very few or no properties.

For future growth trends see **"Appendix A"**

Comparison of Jurisdictional Relative Risk: Quincy-George Region

Hazard	Probability of Occurrence	Impacted Area	Health & Safety Impacts	Property Impacts	Environmental Impacts	Economic Impacts	Total Hazard Rating
Natural	Total Natural Hazard Risk Rating: **286**						
Drought	3	4	0	1	2	2	**32**
Earthquake	3	2	0	1	0	1	**10**
Flooding	2	3	1	1	1	1	**18**
Hail	2	5	0	1	2	1	**30**
High Winds	3	5	2	2	1	2	**50**
Infestation, Disease	2	1	1	0	3	2	**8**

Hazard	Probability of Occurrence	Impacted Area	Health & Safety Impacts	Property Impacts	Environmental Impacts	Economic Impacts	Total Hazard Rating
Landslide, Erosion	0	1	0	1	0	1	**2**
Lightning	1	5	1	1	0	1	**20**
Major Fire – Urban	2	2	2	2	1	1	**16**
Major Fire – Wildland	1	5	1	1	1	1	**25**
Severe Winter Storm	4	5	1	1	1	2	**45**
Volcano Activity	0	1	0	0	0	0	0
Technological	**Total Technological Hazard Risk Rating:** 235						
Civil Disturbance	3	1	1	1	0	1	**12**
Communications	4	4	0	1	0	1	**20**
Hazardous Materials	4	2	1	1	1	2	**28**
Loss of Electrical	5	4	1	0	0	1	**30**
Loss of Gas / Fuel	2	3	0	0	0	1	**8**
Loss of Sewer	4	4	1	1	1	1	**32**
Loss of Water	4	4	1	1	0	1	**28**
Radiological	3	2	2	2	2	3	**33**
Special Hazards	4	1	1	1	0	2	**20**
Transportation	3	4	1	1	1	1	**24**
Total Relative Risk: **521**							

Note: See table on next page for explanation of ratings.

Impact Area		*Probability of Occurrence*		*Health & Safety Impacts*	
0	No developed area impacted	1	Unknown but rare occurrence	0	No Health and Safety impact
1	Less that 25% of developed areas impacted	2	Unknown but anticipate an occurrence	1	Few injuries/illnesses
2	Less than 50% of developed area impacted	3	100 years or less occurrence	2	Few fatalities but many injuries/illnesses
3	Less than 75% of developed area impacted	4	25 years or less occurrence	3	Numerous fatalities
4	Over 75% of developed area impacted	5	Once a year or more occurrence		

Property Impacts		*Environmental Impacts*		*Economic Impacts*	
0	No property damage	0	Little or no environmental damage	0	No economic impact
1	Few properties destroyed - few properties damaged	1	Resources damaged with short term recovery practical	1	Low direct and/or low indirect costs
2	Few destroyed - many damaged	2	Resources damaged with long term recovery feasible	2	High direct & low indirect costs
2	Few damaged - many destroyed	3	Resources destroyed beyond recovery	2	Low direct & high indirect costs
3	Many properties destroyed and damaged			3	High direct && high indirect costs

Property at Risk

To make jurisdiction-wide analysis of the dollar value of properties at risk for each hazard type feasible and practical for mitigation planning purposes, a simplified approach has been used. The estimate of the dollar value of properties at risk for specific hazards is accomplished in the following manner: The number of structures in a specific neighborhood and the average dollar value for those structures is

estimated by local planners, based on readily available data or their best judgment in the absence of suitable data.
(Note: In many cases the median value was used from recent census data when the average value was not readily available. This average value of the residences in a neighborhood somewhat undervalues the property at risk.) The percentage of the specific neighborhood threatened by the identified hazard is then estimated by local planners, again based on readily available data or their best judgment. The percent of the neighborhood at risk is then used as a multiplier to determine the estimated number of structures at risk from that hazard. This number is then multiplied by the estimated average cost of the structures to derive an estimated total value of the property at risk of damage in that neighborhood from the identified hazard. The methodology is simplistic but conservative in that it assumes structures are uniformly distributed throughout the neighborhood in relation to the area of risk that the hazard threatens the entire value of each structure, and that structures are equally vulnerable to the impacts of the hazard. The derived estimates for the dollar value of property at risk may therefore be higher than would actually be the case, but the estimates are considered satisfactory to support the local mitigation planning process.

People at Risk

The estimated total populations for each neighborhood by jurisdiction are given in the table below which are determined by local planners through readily available data or their best judgment in the absence of suitable data. If a person wanted to determine the percentage of the population at risk in a particular neighborhood, the following method should be used: multiply the percent of structures at risk by the total estimated neighborhood population. The methodology is simplistic but conservative in that it assumes occupied structures are uniformly distributed throughout the neighborhood in relation to the area of risk, that the population is present on a 24 hour, 7 day basis, and that all individuals are equally vulnerable to the impacts of the hazard event. Therefore, an estimation of the percentage of a population at risk may be higher than is actually the case, but is considered satisfactory to support the local mitigation planning process.

Grant County
Mitigation 20/20 Task ™
Estimated Value of Structures at Risk, by

	Use	Estimated Number Of Structures	Average Value of Each Structure	Percent of Structures at Risk	Total Estimated Value ($) of Structures at Risk
Quincy					
Hazard Civil Disturbance					
Neighborhood Name					
Crescent Bar	Residential	60	$200,000.00	25%	$3,000,000
Irrigation Block 71/Station 33	Other	253	$125,000.00	5%	$1,581,250
Low Gap/Station 34	Other	49	$125,000.00	5%	$306,250
Quincy Rural Station 31	Mixed Use	911	$150,000.00	10%	$13,665,000
Quincy Station #30	Mixed Use	1613	$175,000.00	25%	$70,568,750
Sunland Estates	Residential	291	$200,000.00	10%	$5,820,000
Winchester	Other	336	$125,000.00	5%	$2,100,000
Hazard Drought					
Neighborhood Name					
Crescent Bar	Residential	60	$200,000.00	5%	$600,000
Irrigation Block 71/Station 33	Other	253	$125,000.00	25%	$7,906,250
Low Gap/Station 34	Other	49	$125,000.00	100%	$6,125,000
Quincy Rural Station 31	Mixed Use	911	$150,000.00	50%	$68,325,000
Quincy Station #30	Mixed Use	1613	$175,000.00	5%	$14,113,750
Sunland Estates	Residential	291	$200,000.00	5%	$2,910,000
Winchester	Other	336	$125,000.00	100%	$42,000,000
Hazard Earthquake					
Neighborhood Name					
Crescent Bar	Residential	60	$200,000.00	10%	$1,200,000
Irrigation Block 71/Station 33	Other	253	$125,000.00	5%	$1,581,250
Low Gap/Station 34	Other	49	$125,000.00	25%	$1,531,250
Quincy Rural Station 31	Mixed Use	911	$150,000.00	5%	$6,832,500
Sunland Estates	Residential	291	$200,000.00	5%	$2,910,000

Winchester	Other	336	$125,000.00	5%	$2,100,000

Hazard Flooding

Neighborhood Name					
Crescent Bar	Residential	60	$200,000.00	100%	$12,000,000
Irrigation Block 71/Station 33	Other	253	$125,000.00	5%	$1,581,250
Low Gap/Station 34	Other	49	$125,000.00	20%	$1,225,000
Quincy Rural Station 31	Mixed Use	911	$150,000.00	5%	$6,832,500
Quincy Station #30	Mixed Use	1613	$175,000.00	5%	$14,113,750
Sunland Estates	Residential	291	$200,000.00	100%	$58,200,000
Winchester	Other	336	$125,000.00	5%	$2,100,000

Hazard Hail

Neighborhood Name					
Crescent Bar	Residential	60	$200,000.00	5%	$600,000
Irrigation Block 71/Station 33	Other	253	$125,000.00	25%	$7,906,250
Low Gap/Station 34	Other	49	$125,000.00	50%	$3,062,500
Quincy Station #30	Mixed Use	1613	$175,000.00	10%	$28,227,500
Sunland Estates	Residential	291	$200,000.00	5%	$2,910,000
Winchester	Other	336	$125,000.00	25%	$10,500,000

Hazard Hazardous Materials

Neighborhood Name					
Irrigation Block 71/Station 33	Other	253	$125,000.00	5%	$1,581,250
Low Gap/Station 34	Other	49	$125,000.00	5%	$306,250
Quincy Rural Station 31	Mixed Use	911	$150,000.00	10%	$13,665,000
Quincy Station #30	Mixed Use	1613	$175,000.00	100%	$282,275,000
Sunland Estates	Residential	291	$200,000.00	1%	$582,000
Winchester	Other	336	$125,000.00	10%	$4,200,000

Hazard High Winds

Neighborhood Name					
Crescent Bar	Residential	60	$200,000.00	50%	$6,000,000
Irrigation Block 71/Station 33	Other	253	$125,000.00	50%	$15,812,500
Low Gap/Station 34	Other	49	$125,000.00	100%	$6,125,000
Quincy Rural Station 31	Mixed Use	911	$150,000.00	100%	$136,650,000
Quincy Station #30	Mixed Use	1613	$175,000.00	50%	$141,137,500
Sunland Estates	Residential	291	$200,000.00	100%	$58,200,000
Winchester	Other	336	$125,000.00	100%	$42,000,000

Hazard Infestation, Disease

Neighborhood Name					
Crescent Bar	Residential	60	$200,000.00	10%	$1,200,000
Irrigation Block 71/Station 33	Other	253	$125,000.00	25%	$7,906,250
Low Gap/Station 34	Other	49	$125,000.00	25%	$1,531,250
Quincy Rural Station 31	Mixed Use	911	$150,000.00	25%	$34,162,500
Quincy Station #30	Mixed Use	1613	$175,000.00	10%	$28,227,500
Sunland Estates	Residential	291	$200,000.00	5%	$2,910,000
Winchester	Other	336	$125,000.00	50%	$21,000,000

Hazard Landslide, Erosion

Neighborhood Name					
Crescent Bar	Residential	60	$200,000.00	10%	$1,200,000
Irrigation Block 71/Station 33	Other	253	$125,000.00	10%	$3,162,500
Low Gap/Station 34	Other	49	$125,000.00	20%	$1,225,000
Quincy Rural Station 31	Mixed Use	911	$150,000.00	5%	$6,832,500
Quincy Station #30	Mixed Use	1613	$175,000.00	5%	$14,113,750
Sunland Estates	Residential291	$200,000.00	50%		$29,100,000
Winchester	Other	336	$125,000.00	25%	$10,500,000

Hazard Lightning

Neighborhood Name					
Crescent Bar	Residential	60	$200,000.00	5%	$600,000
Irrigation Block 71/Station 33	Other	253	$125,000.00	5%	$1,581,250
Low Gap/Station 34	Other	49	$125,000.00	5%	$306,250
Quincy Rural Station 31	Mixed Use	911	$150,000.00	5%	$6,832,500
Quincy Station #30	Mixed Use	1613	$175,000.00	5%	$14,113,750
Sunland Estates	Residential	291	$200,000.00	5%	$2,910,000
Winchester	Other	336	$125,000.00	5%	$2,100,000

Hazard Loss of Electrical Service

Neighborhood Name					
Crescent Bar	Residential	60	$200,000.00	100%	$12,000,000
Irrigation Block 71/Station 33	Other	253	$125,000.00	100%	$31,625,000
Low Gap/Station 34	Other	49	$125,000.00	100%	$6,125,000
Quincy Rural Station 31	Mixed Use	911	$150,000.00	100%	$136,650,000
Quincy Station #30	Mixed Use	1613	$175,000.00	100%	$282,275,000
Sunland Estates	Residential	291	$200,000.00	100%	$58,200,000
Winchester	Other	336	$125,000.00	100%	$42,000,000

Hazard Loss of Gas Service

Neighborhood Name

Crescent Bar	Residential	60	$200,000.00	100%	$12,000,000
Irrigation Block 71/Station 33	Other	253	$125,000.00	100%	$31,625,000
Low Gap/Station 34	Other	49	$125,000.00	5%	$306,250
Quincy Rural Station 31	Mixed Use	911	$150,000.00	100%	$136,650,000
Quincy Station #30	Mixed Use	1613	$175,000.00	100%	$282,275,000
Sunland Estates	Residential	291	$200,000.00	5%	$2,910,000
Winchester	Other	336	$125,000.00	5%	$2,100,000

Hazard Loss of Sewer Service

Neighborhood Name					
Quincy Rural Station 31	Mixed Use	911	$150,000.00	5%	$6,832,500
Quincy Station #30	Mixed Use	1613	$175,000.00	100%	$282,275,000

Hazard Loss of Water Service

Neighborhood Name					
Crescent Bar	Residential	60	$200,000.00	100%	$12,000,000
Quincy Rural Station 31	Mixed Use	911	$150,000.00	5%	$6,832,500
Quincy Station #30	Mixed Use	1613	$175,000.00	100%	$282,275,000
Sunland Estates	Residential	291	$200,000.00	100%	$58,200,000

Hazard Major Fire - Urban

Neighborhood Name					
Crescent Bar	Residential	60	$200,000.00	50%	$6,000,000
Quincy Rural Station 31	Mixed Use	911	$150,000.00	1%	$1,366,500
Quincy Station #30	Mixed Use	1613	$175,000.00	25%	$70,568,750
Sunland Estates	Residential	291	$200,000.00	25%	$14,550,000
Winchester	Other	336	$125,000.00	5%	$2,100,000

Hazard Major Fire -Wildland

Neighborhood Name					
Crescent Bar	Residential	60	$200,000.00	10%	$1,200,000
Irrigation Block 71/Station 33	Other	253	$125,000.00	10%	$3,162,500
Low Gap/Station 34	Other	49	$125,000.00	25%	$1,531,250
Quincy Rural Station 31	Mixed Use	911	$150,000.00	10%	$13,665,000
Quincy Station #30	Mixed Use	1613	$175,000.00	2%	$5,645,500
Sunland Estates	Residential	291	$200,000.00	10%	$5,820,000
Winchester	Other	336	$125,000.00	25%	$10,500,000

Hazard Radiological

Neighborhood Name					
Crescent Bar	Residential	60	$200,000.00	5%	$600,000
Irrigation Block 71/Station 33	Other	253	$125,000.00	5%	$1,581,250

Low Gap/Station 34	Other	49	$125,000.00	5%	$306,250
Quincy Rural Station 31	Mixed Use	911	$150,000.00	5%	$6,832,500
Quincy Station #30	Mixed Use	1613	$175,000.00	5%	$14,113,750
Sunland Estates	Residential	291	$200,000.00	5%	$2,910,000

Hazard Severe Winter Storm

Neighborhood Name					
Crescent Bar	Residential	60	$200,000.00	100%	$12,000,000
Irrigation Block 71/Station 33	Other	253	$125,000.00	100%	$31,625,000
Low Gap/Station 34	Other	49	$125,000.00	100%	$6,125,000
Quincy Rural Station 31	Mixed Use	911	$150,000.00	50%	$68,325,000
Quincy Station #30	Mixed Use	1613	$175,000.00	100%	$282,275,000
Sunland Estates	Residential	291	$200,000.00	100%	$58,200,000
Winchester	Other	336	$125,000.00	100%	$42,000,000

Hazard Special Hazards

Neighborhood Name					
Crescent Bar	Residential	60	$200,000.00	20%	$2,400,000
Irrigation Block 71/Station 33	Other	253	$125,000.00	5%	$1,581,250
Low Gap/Station 34	Other	49	$125,000.00	5%	$306,250
Quincy Station #30	Mixed Use	1613	$175,000.00	25%	$70,568,750
Sunland Estates	Residential	291	$200,000.00	10%	$5,820,000
Winchester	Other	336	$125,000.00	10%	$4,200,000

Hazard Telecommunications

Neighborhood Name					
Crescent Bar	Residential	60	$200,000.00	100%	$12,000,000
Irrigation Block 71/Station 33	Other	253	$125,000.00	100%	$31,625,000
Low Gap/Station 34	Other	49	$125,000.00	100%	$6,125,000
Quincy Rural Station 31	Mixed Use	911	$150,000.00	100%	$136,650,000
Quincy Station #30	Mixed Use	1613	$175,000.00	100%	$282,275,000
Sunland Estates	Residential	291	$200,000.00	100%	$58,200,000
Winchester	Other	336	$125,000.00	100%	$42,000,000

Hazard Transportation

Neighborhood Name					
Crescent Bar	Residential	60	$200,000.00	5%	$600,000
Irrigation Block 71/Station 33	Other	253	$125,000.00	5%	$1,581,250
Quincy Rural Station 31	Mixed Use	911	$150,000.00	5%	$6,832,500
Quincy Station #30	Mixed Use	1613	$175,000.00	10%	$28,227,500
Sunland Estates	Residential	291	$200,000.00	5%	$2,910,000

Winchester	Other	336	$125,000.00	5%	$2,100,000

	Use	Estimated Number Of Structures	Average Value of Each Structure	Percent of Structures at Risk	Total Estimated Value ($) of Structures at Risk
George					
Hazard Civil Disturbance					
Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	100%	$2,100,000
North Washington Way Commercial	Commercial/Retail	4	$30,000.00	100%	$120,000
North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Parkhill Residential	Residential	12	$30,000.00	100%	$360,000
Richmond Avenue Commercial	Government	24	$30,000.00	100%	$720,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	100%	$700,000
Rural George	Other	678	$150,000.00	20%	$20,340,000
South Washington Way	Institutional	1	$350,000.00	100%	$350,000
West Montmorency	Commercial/Retail	4	$150,000.00	100%	$600,000
West Montmorency	Residential	41	$30,000.00	100%	$1,230,000
Hazard Drought					
Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	100%	$2,100,000
North Washington Way Commercial	Commercial/Retail	4	$30,000.00	100%	$120,000
North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Parkhill Residential	Residential	12	$30,000.00	100%	$360,000
Richmond Avenue Commercial	Government	24	$30,000.00	100%	$720,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	100%	$700,000

Rural George	Other	678	$150,000.00	50%	$50,850,000
South Washington Way	Institutional	1	$350,000.00	100%	$350,000
West Montmorency	Commercial/Retail	4	$150,000.00	100%	$600,000
West Montmorency	Residential	41	$30,000.00	100%	$1,230,000

Hazard Earthquake

Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	100%	$2,100,000
North Washington Way Commercial	Commercial/Retail	4	$30,000.00	100%	$120,000
North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Parkhill Residential	Residential	12	$30,000.00	100%	$360,000
Richmond Avenue Commercial	Government	24	$30,000.00	100%	$720,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	100%	$700,000
Rural George	Other	678	$150,000.00	10%	$10,170,000
South Washington Way	Institutional	1	$350,000.00	100%	$350,000
West Montmorency	Commercial/Retail	4	$150,000.00	100%	$600,000
West Montmorency	Residential	41	$30,000.00	100%	$1,230,000

Hazard Flooding

Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	5%	$105,000
North Washington Way Commercial	Commercial/Retail	4	$30,000.00	5%	$6,000
North Washington Way Industrial	Industrial	10	$80,000.00	5%	$40,000
Parkhill Residential	Residential	12	$30,000.00	5%	$18,000
Richmond Avenue Commercial	Government	24	$30,000.00	5%	$36,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	5%	$35,000
Rural George	Other	678	$150,000.00	5%	$5,085,000
South Washington Way	Institutional	1	$350,000.00	5%	$17,500
West Montmorency	Commercial/Retail	4	$150,000.00	5%	$30,000
West Montmorency	Residential	41	$30,000.00	5%	$61,500

Hazard Hail

Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	100%	$2,100,000
North Washington Way Commercial	Commercial/Retail	4	$30,000.00	100%	$120,000

North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Parkhill Residential	Residential	12	$30,000.00	100%	$360,000
Richmond Avenue Commercial	Government	24	$30,000.00	100%	$720,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	100%	$700,000
Rural George	Other	678	$150,000.00	10%	$10,170,000
South Washington Way	Institutional	1	$350,000.00	100%	$350,000
West Montmorency	Commercial/Retail	4	$150,000.00	100%	$600,000
West Montmorency	Residential	41	$30,000.00	100%	$1,230,000

Hazard Hazardous Materials

Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	100%	$2,100,000
North Washington Way Commercial	Commercial/Retail	4	$30,000.00	100%	$120,000
North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Parkhill Residential	Residential	12	$30,000.00	100%	$360,000
Richmond Avenue Commercial	Government	24	$30,000.00	100%	$720,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	100%	$700,000
Rural George	Other	678	$150,000.00	10%	$10,170,000
South Washington Way	Institutional	1	$350,000.00	100%	$350,000
West Montmorency	Commercial/Retail	4	$150,000.00	100%	$600,000
West Montmorency	Residential	41	$30,000.00	100%	$1,230,000

Hazard High Winds

Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	100%	$2,100,000
North Washington Way Commercial	Commercial/Retail	4	$30,000.00	100%	$120,000
North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Parkhill Residential	Residential	12	$30,000.00	100%	$360,000
Richmond Avenue Commercial	Government	24	$30,000.00	100%	$720,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	100%	$700,000
Rural George	Other	678	$150,000.00	100%	$101,700,000
South Washington Way	Institutional	1	$350,000.00	100%	$350,000
West Montmorency	Commercial/Retail	4	$150,000.00	100%	$600,000
West Montmorency	Residential	41	$30,000.00	100%	$1,230,000

Hazard Infestation, Disease

Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	100%	$2,100,000
North Washington Way Commercial	Commercial/Retail	4	$30,000.00	100%	$120,000
North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Parkhill Residential	Residential	12	$30,000.00	100%	$360,000
Richmond Avenue Commercial	Government	24	$30,000.00	100%	$720,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	100%	$700,000
Rural George	Other	678	$150,000.00	20%	$20,340,000
South Washington Way	Institutional	1	$350,000.00	100%	$350,000
West Montmorency	Commercial/Retail	4	$150,000.00	100%	$600,000
West Montmorency	Residential	41	$30,000.00	100%	$1,230,000

Hazard Landslide, Erosion

Neighborhood Name					
North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Rural George	Other	678	$150,000.00	5%	$5,085,000

Hazard Lightning

Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	100%	$2,100,000
North Washington Way Commercial	Commercial/Retail	4	$30,000.00	100%	$120,000
North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Parkhill Residential	Residential	12	$30,000.00	100%	$360,000
Richmond Avenue Commercial	Government	24	$30,000.00	100%	$720,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	100%	$700,000
Rural George	Other	678	$150,000.00	5%	$5,085,000
South Washington Way	Institutional	1	$350,000.00	100%	$350,000
West Montmorency	Commercial/Retail	4	$150,000.00	100%	$600,000
West Montmorency	Residential	41	$30,000.00	100%	$1,230,000

Hazard Loss of Electrical Service

Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	100%	$2,100,000
North Washington Way	Commercial/Retail	4	$30,000.00	100%	$120,000

Commercial					
North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Parkhill Residential	Residential	12	$30,000.00	100%	$360,000
Richmond Avenue Commercial	Government	24	$30,000.00	100%	$720,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	100%	$700,000
Rural George	Other	678	$150,000.00	100%	$101,700,000
South Washington Way	Institutional	1	$350,000.00	100%	$350,000
West Montmorency	Commercial/Retail	4	$150,000.00	100%	$600,000
West Montmorency	Residential	41	$30,000.00	100%	$1,230,000

Hazard Loss of Gas Service

Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	100%	$2,100,000
North Washington Way Commercial	Commercial/Retail	4	$30,000.00	100%	$120,000
North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Parkhill Residential	Residential	12	$30,000.00	100%	$360,000
Richmond Avenue Commercial	Government	24	$30,000.00	100%	$720,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	100%	$700,000
Rural George	Other	678	$150,000.00	5%	$5,085,000
South Washington Way	Institutional	1	$350,000.00	100%	$350,000
West Montmorency	Commercial/Retail	4	$150,000.00	100%	$600,000
West Montmorency	Residential	41	$30,000.00	100%	$1,230,000

Hazard Loss of Sewer Service

Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	100%	$2,100,000
North Washington Way Commercial	Commercial/Retail	4	$30,000.00	100%	$120,000
North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Parkhill Residential	Residential	12	$30,000.00	100%	$360,000
Richmond Avenue Commercial	Government	24	$30,000.00	100%	$720,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	100%	$700,000
Rural George	Other	678	$150,000.00	50%	$50,850,000
South Washington Way	Institutional	1	$350,000.00	100%	$350,000
West Montmorency	Commercial/Retail	4	$150,000.00	100%	$600,000

West Montmorency	Residential	41	$30,000.00	100%	$1,230,000

Hazard Loss of Water Service

Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	100%	$2,100,000
North Washington Way Commercial	Commercial/Retail	4	$30,000.00	100%	$120,000
North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Parkhill Residential	Residential	12	$30,000.00	100%	$360,000
Richmond Avenue Commercial	Government	24	$30,000.00	100%	$720,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	100%	$700,000
South Washington Way	Institutional	1	$350,000.00	100%	$350,000
West Montmorency	Commercial/Retail	4	$150,000.00	100%	$600,000
West Montmorency	Residential	41	$30,000.00	100%	$1,230,000

Hazard Major Fire - Urban

Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	100%	$2,100,000
North Washington Way Commercial	Commercial/Retail	4	$30,000.00	100%	$120,000
North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Parkhill Residential	Residential	12	$30,000.00	100%	$360,000
Richmond Avenue Commercial	Government	24	$30,000.00	100%	$720,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	100%	$700,000
Rural George	Other	678	$150,000.00	10%	$10,170,000
South Washington Way	Institutional	1	$350,000.00	100%	$350,000
West Montmorency	Commercial/Retail	4	$150,000.00	100%	$600,000
West Montmorency	Residential	41	$30,000.00	100%	$1,230,000

Hazard Major Fire -Wildland

Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	100%	$2,100,000
North Washington Way Commercial	Commercial/Retail	4	$30,000.00	100%	$120,000
North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Richmond Avenue Commercial	Government	24	$30,000.00	100%	$720,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	100%	$700,000

Rural George	Other	678	$150,000.00	10%	$10,170,000
South Washington Way	Institutional	1	$350,000.00	100%	$350,000
West Montmorency	Commercial/Retail	4	$150,000.00	100%	$600,000
West Montmorency	Residential	41	$30,000.00	100%	$1,230,000

Hazard Radiological

Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	100%	$2,100,000
North Washington Way Commercial	Commercial/Retail	4	$30,000.00	100%	$120,000
North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Parkhill Residential	Residential	12	$30,000.00	100%	$360,000
Richmond Avenue Commercial	Government	24	$30,000.00	100%	$720,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	100%	$700,000
South Washington Way	Institutional	1	$350,000.00	100%	$350,000
West Montmorency	Commercial/Retail	4	$150,000.00	100%	$600,000
West Montmorency	Residential	41	$30,000.00	100%	$1,230,000

Hazard Severe Winter Storm

Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	100%	$2,100,000
North Washington Way Commercial	Commercial/Retail	4	$30,000.00	100%	$120,000
North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Parkhill Residential	Residential	12	$30,000.00	100%	$360,000
Richmond Avenue Commercial	Government	24	$30,000.00	100%	$720,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	100%	$700,000
Rural George	Other	678	$150,000.00	100%	$101,700,000
South Washington Way	Institutional	1	$350,000.00	100%	$350,000
West Montmorency	Commercial/Retail	4	$150,000.00	100%	$600,000
West Montmorency	Residential	41	$30,000.00	100%	$1,230,000

Hazard Special Hazards

Neighborhood Name					
North Washington Way Industrial	Industrial	10	$80,000.00	50%	$400,000
Parkhill Residential	Residential	12	$30,000.00	50%	$180,000
Rural George	Other	678	$150,000.00	10%	$10,170,000

Hazard Telecommunications

Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	100%	$2,100,000
North Washington Way Commercial	Commercial/Retail	4	$30,000.00	100%	$120,000
North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Parkhill Residential	Residential	12	$30,000.00	100%	$360,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	100%	$700,000
Rural George	Other	678	$150,000.00	100%	$101,700,000
South Washington Way	Institutional	1	$350,000.00	100%	$350,000
West Montmorency	Commercial/Retail	4	$150,000.00	100%	$600,000
West Montmorency	Residential	41	$30,000.00	100%	$1,230,000

Hazard Transportation

Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	100%	$2,100,000
North Washington Way Commercial	Commercial/Retail	4	$30,000.00	100%	$120,000
North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Parkhill Residential	Residential	12	$30,000.00	100%	$360,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	100%	$700,000
Rural George	Other	678	$150,000.00	5%	$5,085,000
South Washington Way	Institutional	1	$350,000.00	100%	$350,000
West Montmorency	Commercial/Retail	4	$150,000.00	100%	$600,000
West Montmorency	Residential	41	$30,000.00	100%	$1,230,000

Hazard Volcano Activity

Neighborhood Name					
East Montmorency Residential	Residential	70	$30,000.00	100%	$2,100,000
North Washington Way Commercial	Commercial/Retail	4	$30,000.00	100%	$120,000
North Washington Way Industrial	Industrial	10	$80,000.00	100%	$800,000
Richmond Avenue Commercial	Government	24	$30,000.00	100%	$720,000
Royal Anne Drive Commercial	Commercial/Retail	7	$100,000.00	100%	$700,000
South Washington Way	Institutional	1	$350,000.00	100%	$350,000
West Montmorency	Commercial/Retail	4	$150,000.00	100%	$600,000

West Montmorency	Residential	41	$30,000.00	100%	$1,230,000

For future growth trends see **"Appendix A"**

Grant County Rural Land Use Analysis: Population, Housing and UGA Land Allocations (Proulx Cearns, Inc., September 1999)

Grant County Fire Protection District #3

Quincy and George

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of FPD #3, severe winter storms has been selected as a hazard of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
FPD3-SH1 1-3	Plan Coordination & Implementation	Develop and Implement a Snow Removal Plan	1 of 3	$500

Governmental Entity:	Grant County Fire Protection District #3, Quincy and George
Hazard Type:	Severe Winter Storm
Initiative Category:	Plan Coordination & Implementation
Priority:	1 of 3

Initiative Nr: FPD3-MH2

Develop and Implement a Snow Removal Plan for fire district.

Rationale:

Fire Protection District #3 (FPD3) has experienced periods in which a winter storm drops heavy snow or ice. Emergency responders have experienced varying degrees of difficulty in responding to emergent events.

The Snow Removal Plan will coordinate snow removal from city and county streets to facilitate emergency response during these events.

Relates to Plan Goal(s):	2. Reduce property damage

Relates to Plan Objective(s):	2A. Design and retrofit essential transportation facilities and systems to minimize the potential for disruption during a disaster.
Implementer:	Fire Chief
Estimated Cost:	$500
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	300: 1

Grant County Fire Protection District #3

Quincy

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of FPD #3, hazard events such as severe winter storms, high winds, utility shortage and lightning have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
FPD3-MH2 2-3	Structure Retrofit	Backup Power Generator	2 of 3	$25,000

Governmental Entity:	Grant County Fire Protection District #3, George Battalion
Hazard Type:	Multi-hazard
Initiative Category:	Structural Retrofit
Priority:	2 of 3

Initiative Nr: FPD3-MH2

Install backup generator set for fire station 31. Add UPS for electronics and computers. New station being built for station 31 in 2005.

Rationale:

A power outage caused by high winds, a winter storm, lightning or other natural or manmade event may result in the freezing of equipment and the inability to respond to an emergency. This critical facility would also need backup electrical power to provide a needed emergency response capability for a prolonged power outage.

Relates to Plan Goal(s):	9. Maintain essential services, facilities, and infrastructures.

Relates to Plan Objective(s):	9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	Fire Chief
Estimated Cost:	$25,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	14.29: 1

Grant County Fire Protection District #3

George Battalion

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of FPD #3, natural hazard events such as severe winter storms, high winds, utility shortage and lightning have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
FPD3-MH1 3-3	Structure Retrofit	Backup Power Generator	3 of 3	$25,000

Governmental Entity:	Grant County Fire Protection District #3, George Battalion
Hazard Type:	Multi-hazard
Initiative Category:	Structural Retrofit
Priority:	3 of 3

Initiative Nr: FPD3-MH1

Purchase of generator set, installation, wiring of automatic transfer switches, maintenance of units and fuel. To be installed at Fire Station #35.

Rationale:

A power outage caused by high winds, a winter storm, lightning or other natural or manmade event may result in the freezing of equipment and the inability to respond to an emergency. This critical facility would also need backup electrical power to provide a needed emergency response capability for a prolonged power outage.

Relates to Plan Goal(s):	9. Maintain essential services, facilities, and infrastructures.

Relates to Plan Objective(s):	9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	Fire Chief
Estimated Cost:	$25,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	14.29: 1

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of City of Quincy, hazard events such as severe winter storms, high winds, utility shortage and lightning have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
Q-MH1	Structure Retrofit	Backup Power Generator for Well #4 and Reservoir	1 of 1	$500,000

Governmental Entity:	City of Quincy
Hazard Type:	Multi-hazard
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: **Q-MH1**

Provide for an emergency backup power system for Well #4 & Reservoir.

Rationale:
A power outage caused by high winds, a winter storm, lightning or other natural or manmade hazard might disrupt the power supply to the City of Quincy's Well #4 & Reservoir, which currently does not have a backup power supply.

Relates to Plan Goal(s):	2. Reduce property damage 9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	2B. Design and retrofit essential water and sewer services to minimize the potential for disruption during a disaster. 9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	City Public Works

Estimated Cost:	$275,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	20.16: 1

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of QSD, severe winter storms have been selected as a hazard of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
QSD-SH1	Plan Coordination & Implementation	Develop and Implement a Snow Removal Plan	1 of 2	$5000

Governmental Entity:	Quincy School District
Hazard Type:	Severe Winter Storm
Initiative Category:	Plan Coordination & Implementation
Priority:	1 of 2

Initiative Nr: QSD-SH1

Develop and Implement an emergency Bus Route Plan for the school district.

Rationale:

The school district will develop and implement an emergency Bus Route Plan that will help the School District prepare for and respond to road closures. In addition, to effective routing of transportation resources the plan will address use of transportation resources during major emergencies or disasters. This also addresses School District political and legal mandates on ensuring equal access to public education opportunities. The plan will include procedures for reporting and responding to road closures as a result of major emergencies or disasters. To incorporate an all-hazard approach to the routine and emergency use of school transportation.

Relates to Plan Goal(s):	2. Reduce property damage

Relates to Plan Objective(s):	2A. Design and retrofit essential transportation facilities and systems to minimize the potential for disruption during a disaster.
Implementer:	Facilities Manager
Estimated Cost:	$5000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	33.3: 1

Quincy School District #144

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of QSD, hazard events such as severe winter storms, high winds, utility shortage and lightning have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
QSD-MH1 2-2	Structure Retrofit	Backup Power Generator	2 of 2	$300,000

Governmental Entity:	Quincy School District #144
Hazard Type:	Multi-hazard
Initiative Category:	Structural Retrofit
Priority:	2 of 2

Initiative Nr: QSD-MH1

Provide diesel generators to provide backup power to all schools in the Quincy School District. Total of school buildings: 5 in Quincy, 1 in George. Schools would be used as shelter in case of a natural disaster.

Rationale:

Backup power generators would allow the schools in the Quincy School District, which encompasses the areas of George and Quincy, to be used as an emergency shelters in short or long-term incidents. Having backup power would allow the school to keep children at the school, instead of sending them home, during hazard events such as a severe winter storm that had caused the power to go out. In a long-term disaster event, many schools could provide a place for area residents to go that would have lighting, heat, and other necessary facilities necessary to shelter them for extended periods of time.

Relates to Plan Goal(s):	9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	Fire Chief
Estimated Cost:	$300,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	5: 1

Town of George

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of the Town of George, utility shortage or failure, fire and hazardous materials have been selected as the primary hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiative that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
TG-MH1	Hazard Damage Reduction	Install Additional Water Well	1 of 2	$395,000
TG-MH2	Structural Retrofit	Install Back-up Power Generator for Sewer Lift Station 2	2 of 2	$30,00

Governmental Entity:	Town of George
Hazard Type:	Multi-hazard
Initiative Category:	Hazard Damage Reduction
Priority:	1 of 2

Initiative Nr: TG-MH1
The Town of George needs to provide more water for fire fighting needs.

Rationale:
If a fire occurred at or around George Elementary School, or other large buildings or several buildings at once, there is not enough water to control the fire and protect staff, students, fire fighters and others.

Relates to Plan Goal(s):	1. Prevent loss of life and injuries 2. Reduce property damage 9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	1A. Provide the highest degree of protection at the least cost by working with natural systems and using

	prevention as a first priority. 2B. Design and retrofit essential water and sewer services to minimize the potential for disruption during a disaster. 9C. Ensure that utility and communications systems supporting emergency operations can withstand the impacts of disasters.
Implementer:	Town of George, Public Works
Estimated Cost:	$395,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	4.06:1

Governmental Entity:	Town of George
Hazard Type:	Technological
Initiative Category:	Structural Retrofit
Priority:	2 of 2

Initiative Nr: TG-MH2
The Town of George needs back-up power to Sewer Lift Station #2.

Rationale:
The Town of George sewer has a six to eight hour holding capacity before sewage empties into the street. If a power outage lasting longer than this occurred, extensive hazardous materials response efforts may be required to clean up the emptied sewage in the town streets. A back-up power generator would mitigate this risk by supplying the lift station with power.

Relates to Plan Goal(s):	1. Prevent loss of life and injuries 9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	1A. Provide the highest degree of protection at the least cost by working with natural systems and using prevention as a first priority.

	2B. Design and retrofit essential water and sewer services to minimize the potential for disruption during a disaster. 9C. Ensure that utility and communications systems supporting emergency operations can withstand the impacts of disasters.
Implementer:	Town of George, Public Works
Estimated Cost:	$30,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	4.0:1

Southwest Region

Municipal Area	Participating Jurisdictions
Mattawa	Town of Mattawa
	Port of Mattawa
	Grant County Hospital District #5
	Wahluke School District
	Fire Protection District #8
Royal City	Royal City
	Port of Royal Slope
	Fire Protection District #10
	Fire Protection District #11

Grant County consists of over sixty taxing districts, including municipalities, port districts, fire districts, and others with leadership in most cases that is part time or volunteer. These diverse entities, with overlapping jurisdictions, often work regionally to address challenges including those caused by natural and manmade hazards. This regional approach was used to identify their own particular hazards and to assess their regional vulnerability to them. The Hazard Identification and Vulnerability matrix was developed by the Hazard Mitigation Task Force members from the Southwest Region.

The purpose of this section of the plan is to assess the vulnerability to the Southwest Region of Grant County in regards to the various hazards previously identified in Chapter 2 of this plan. In addition, mitigation strategies that are currently in place relating to these hazards as well as newly proposed mitigation strategies have been included in this section of the plan. To complete the vulnerability assessment process, various county staff utilized a series of forms available in the 20/20 Mitigation Software. The information collected with these forms is included in this portion of the plan.

As part of the vulnerability assessment process, officials completed an inventory of all critical facilities and have considered these critical facilities in their planning and mitigation strategy development process. *At this point, the planning process has identified over 200 critical facilities in Grant County.* However, due to post 9/11 concerns, those facilities are not listed in this document. In addition, further action will be taken to document these facilities with both photographs and Global Positioning System (GPS) coordinates in a Geographical Information Services (GIS) mapping. A list of these facilities will be made available to FEMA personnel in the event this information is required to obtain future hazard mitigation grant funding.

Representatives from local government worked closely with other agencies and Grant County Emergency Management staff to develop a comprehensive, coordinated mitigation plan intended to reduce the vulnerability to hazards within the Southwest Region of Grant County. This document presents the results of this effort to identify the specific hazards threatening the Southwest Region and to identify current as well as proposed mitigation strategies, projects and/or programs to address identified vulnerabilities.

The assessment is based on the best currently available information and data regarding the characteristics of the neighborhoods identified, the hazards that threaten the people, property, and environment of these neighborhoods as well as the impacts these neighborhoods have suffered in past disasters. This

information includes, when available, United States Census data, local tax records, local and national geographic information system data, Flood Insurance Rate Maps, hazard specific analyses, and other environmental and demographic facts.

However, very often authoritative or current information simply was not available for the planning effort. In these cases, the experience, knowledge and judgment of local officials were used in the planning, including assumptions and approximations that were believed to be reasonable. In addition, straight-forward, simplified technical analyses were used for tasks such as estimating property values, determining the size of populations affected, and so forth. The reliance on the judgment of knowledgeable officials and simplified analyses is considered acceptable at this stage to allow the participating organizations to complete the tasks needed to develop this multi-jurisdictional hazard mitigation plan. As the planning continues in future years, or at the time when a proposed mitigation initiative is intended to be funded and/or implemented, the participating organizations/jurisdictions recognize that additional information and analyses may be required. Local government is committed to the implementation of the mitigation-related projects/programs described in this section of the plan when and if resources become available. Local government is also committed to continuing the mitigation planning process that has resulted in the development of this document, and to the ongoing cooperation with other agencies, organizations, and jurisdictions to make Grant County more resistant to the damages and hardships that could otherwise be the result of future disasters.

Southwest Region Overview

Town of Mattawa

Contact Information:
Judy Esser, Mayor
P.O. Box 965
Mattawa, WA 99349
Telephone: (509) 932-4037
Population of Jurisdiction: 2609 and growing slightly
Principal Economic Base: Agricultural
Economic Characteristic: Impoverished

Jurisdiction-Specific Vulnerability Assessment & Mitigation Strategies

Current Hazard Mitigation Codes/Plans/Ordinances:

- Comprehensive Land Use Plan
- Adopted Land Use/Zoning Code
- Adopted Building Code
- Zoning Code

Town of Mattawa Current Land Uses and Potential for New Development

Current Land Use Category	Percent of Jurisdiction
Agricultural	35 %
Commercial	1 %
Residential	1 %
Industrial	42 %

Institutional	2 %
Parks/restricted wild land/wildlife refuge	4 %
Vacant/unused government ownership	10 %
Residential	3 %

10% of the Town of Mattawa is still open to development. Little or no development is occurring and expansion, development or construction of existing properties is occurring to some property in a few locations.

Royal City

Contact Information:
Justin Jenks, Mayor
P.O. Box 1239
Royal City, WA 99357
Telephone: (509) 346-2263
Population of Jurisdiction: 1823 and growing slightly
Principal Economic Base: Agricultural
Economic Characteristic: Economically disadvantaged

Jurisdiction-Specific Vulnerability Assessment & Mitigation Strategies

Current Hazard Mitigation Codes/Plans/Ordinances:

- Comprehensive Land Use Plan
- Adopted Land Use/Zoning Code
- Adopted Building Code
- Zoning Code

Royal City Current Land Uses and Potential for New Development

Current Land Use Category	Percent of Jurisdiction
Agricultural	47%
Commercial	3%
Residential	7 %
Industrial	29 %
Institutional	2 %
Parks/restricted wild land/wildlife refuge	2 %
Vacant/unused government ownership	1 %
Residential (future)	9 %

57 % of the Royal City GMA is still open to development. Little or no development is occurring and expansion, development or construction of existing properties is occurring to some property in a few locations.

Comparison of Jurisdictional Relative Risk: Southwest Region

Hazard	Probability of Occurrence	Impacted Area	Health & Safety Impacts	Property Impacts	Environmental Impacts	Economic Impacts	Total Hazard Rating
Natural	Total Natural Hazard Risk Rating: **358**						
Drought	4	4	1	1	1	2	**36**
Earthquake	4	2	1	1	0	1	**14**
Flooding	2	4	1	2	1	1	**28**
Hail	2	5	0	1	2	1	**30**
High Winds	4	5	2	2	3	2	**65**
Infestation, Disease	4	2	2	1	1	1	**18**
Landslide, Erosion	2	2	1	1	1	1	**12**
Lightning	4	5	1	1	0	1	**35**
Major Fire – Urban	1	4	1	2	1	1	**24**
Major Fire – Wildland	2	4	1	1	1	1	**24**
Severe Winter Storm	4	5	1	2	1	1	**45**
Volcano Activity	4	3	1	1	1	2	**27**
Technological	Total Technological Hazard Risk Rating: **219**						
Civil Disturbance	1	2	1	2	1	2	**8**
Communications	2	4	1	0	1	2	**16**
Hazardous Materials	3	2	2	2	2	2	**30**
Loss of Electrical	4	3	1	1	1	2	**32**
Loss of Gas / Fuel	2	3	1	1	1	2	**16**
Loss of Sewer	3	3	1	1	1	2	**24**
Loss of Water	3	3	1	1	2	3	**30**
Radiological	2	4	2	2	2	3	**26**
Special Hazards	2	2	2	2	1	2	**18**
Transportation	1	3	1	0	1	3	**8**
	Total Relative Risk: **577**						

Note: See table below for explanation of ratings.

Impact Area		*Probability of Occurrence*		*Health & Safety Impacts*	
0	No developed area impacted	1	Unknown but rare occurrence	0	No Health and Safety impact
1	Less that 25% of developed areas impacted	2	Unknown but anticipate an occurrence	1	Few injuries/illnesses
2	Less than 50% of developed area impacted	3	100 years or less occurrence	2	Few fatalities but many injuries/illnesses
3	Less than 75% of developed area impacted	4	25 years or less occurrence	3	Numerous fatalities
4	Over 75% of developed area impacted	5	Once a year or more occurrence		

Property Impacts		*Environmental Impacts*		*Economic Impacts*	
0	No property damage	0	Little or no environmental damage	0	No economic impact
1	Few properties destroyed - few properties damaged	1	Resources damaged with short term recovery practical	1	Low direct and/or low indirect costs
2	Few destroyed - many damaged	2	Resources damaged with long term recovery feasible	2	High direct & low indirect costs
2	Few damaged - many destroyed	3	Resources destroyed beyond recovery	2	Low direct & high indirect costs
3	Many properties destroyed and damaged			3	High direct && high indirect costs

Property at Risk

To make jurisdiction-wide analysis of the dollar value of properties at risk for each hazard type feasible and practical for mitigation planning purposes, a simplified approach has been used. The estimate of the dollar value of properties at risk for specific hazards is accomplished in the following manner: The number of structures in a specific neighborhood and the average dollar value for those structures is estimated by local planners, based on readily available data or their best judgment in the absence of suitable data.

(Note: In many cases the median value was used from recent census data when the average value was not readily available. This average value of the residences in a neighborhood somewhat undervalues the property at risk.) The percentage of the specific neighborhood threatened by the identified hazard is then estimated by local planners, again based on readily available data or their best judgment. The percent of the neighborhood at risk is then used as a multiplier to determine the estimated number of structures at risk from that hazard. This number is then multiplied by the estimated average cost of the structures to derive an estimated total value of the property at risk of damage in that neighborhood from the identified hazard. The methodology is simplistic but conservative in that it assumes structures are uniformly distributed throughout the neighborhood in relation to the area of risk that the hazard threatens the entire value of each structure, and that structures are equally vulnerable to the impacts of the hazard. The derived estimates for the dollar value of property at risk may therefore be higher than would actually be the case, but the estimates are considered satisfactory to support the local mitigation planning process.

People at Risk

The estimated total populations for each neighborhood by jurisdiction are given in the table below which are determined by local planners through readily available data or their best judgment in the absence of suitable data. If a person wanted to determine the percentage of the population at risk in a particular neighborhood, the following method should be used: multiply the percent of structures at risk by the total estimated neighborhood population. The methodology is simplistic but conservative in that it assumes occupied structures are uniformly distributed throughout the neighborhood in relation to the area of risk, that the population is present on a 24 hour, 7 day basis, and that all individuals are equally vulnerable to the impacts of

the hazard event. Therefore, an estimation of the percentage of a population at risk may be higher than is actually the case, but is considered satisfactory to support the local mitigation planning process.

Grant County
Mitigation 20/20 Task ™
Estimated Value of Structures at Risk, by

	Use	Estimated Number Of Structures	Average Value of Each Structure	Percent of Structures at Risk	Total Estimated Value ($) of Structures at Risk
Mattawa					
Hazard Civil Disturbance					
Neighborhood Name					
Town of Mattawa	Mixed Use	700	$68,500.00	100%	$47,950,000
Wahluke School District #73	Institutional	4	$5,000,000.00	100%	$20,000,000
Hazard Drought					
Neighborhood Name					
Desert Aire	Residential	650	$110,000.00	100%	$71,500,000
Port of Mattawa	Commercial/Retail	10	$3,000,000.00	100%	$30,000,000
Town of Mattawa	Mixed Use	700	$68,500.00	100%	$47,950,000
Wahluke School District #73	Institutional	4	$5,000,000.00	100%	$20,000,000
Hazard Earthquake					
Neighborhood Name					
Desert Aire	Residential	650	$110,000.00	100%	$71,500,000
Port of Mattawa	Commercial/Retail	10	$3,000,000.00	100%	$30,000,000
Town of Mattawa	Mixed Use	700	$68,500.00	100%	$47,950,000
Wahluke School District #73	Institutional	4	$5,000,000.00	100%	$20,000,000
Hazard Flooding					
Neighborhood Name					
Desert Aire	Residential	650	$110,000.00	5%	$3,575,000
Port of Mattawa	Commercial/Retail	10	$3,000,000.00	5%	$1,500,000
Town of Mattawa	Mixed Use	700	$68,500.00	5%	$2,397,500
Wahluke School District #73	Institutional	4	$5,000,000.00	100%	$20,000,000
Hazard Hail					
Neighborhood Name					
Desert Aire	Residential	650	$110,000.00	100%	$71,500,000
Port of Mattawa	Commercial/Retail	10	$3,000,000.00	100%	$30,000,000

Town of Mattawa	Mixed Use	700	$68,500.00	100%	$47,950,000
Wahluke School District #73	Institutional	4	$5,000,000.00	100%	$20,000,000

Hazard Hazardous Materials

Neighborhood Name					
Town of Mattawa	Mixed Use	700	$68,500.00	100%	$47,950,000
Wahluke School District #73	Institutional	4	$5,000,000.00	100%	$20,000,000

Hazard High Winds

Neighborhood Name					
Desert Aire	Residential	650	$110,000.00	100%	$71,500,000
Port of Mattawa	Commercial/Retail	10	$3,000,000.00	100%	$30,000,000
Town of Mattawa	Mixed Use	700	$68,500.00	100%	$47,950,000
Wahluke School District #73	Institutional	4	$5,000,000.00	100%	$20,000,000

Hazard Infestation, Disease

Neighborhood Name					
Desert Aire	Residential	650	$110,000.00	100%	$71,500,000
Port of Mattawa	Commercial/Retail	10	$3,000,000.00	100%	$30,000,000
Town of Mattawa	Mixed Use	700	$68,500.00	100%	$47,950,000
Wahluke School District #73	Institutional	4	$5,000,000.00	100%	$20,000,000

Hazard Lightning

Neighborhood Name					
Desert Aire	Residential	650	$110,000.00	100%	$71,500,000
Port of Mattawa	Commercial/Retail	10	$3,000,000.00	100%	$30,000,000
Town of Mattawa	Mixed Use	700	$68,500.00	100%	$47,950,000
Wahluke School District #73	Institutional	4	$5,000,000.00	100%	$20,000,000

Hazard Loss of Electrical Service

Neighborhood Name					
Town of Mattawa	Mixed Use	700	$68,500.00	100%	$47,950,000
Wahluke School District #73	Institutional	4	$5,000,000.00	100%	$20,000,000

Hazard Loss of Gas Service

Neighborhood Name					
Town of Mattawa	Mixed Use	700	$68,500.00	100%	$47,950,000
Wahluke School District #73	Institutional	4	$5,000,000.00	100%	$20,000,000

Hazard Loss of Sewer Service

Neighborhood Name					
Town of Mattawa	Mixed Use	700	$68,500.00	100%	$47,950,000
Wahluke School District #73	Institutional	4	$5,000,000.00	100%	$20,000,000

Hazard Loss of Water Service

Neighborhood Name					
Town of Mattawa	Mixed Use	700	$68,500.00	100%	$47,950,000

Hazard Major Fire - Urban

Neighborhood Name					
Desert Aire	Residential	650	$110,000.00	100%	$71,500,000
Port of Mattawa	Commercial/Retail	10	$3,000,000.00	100%	$30,000,000
Town of Mattawa	Mixed Use	700	$68,500.00	100%	$47,950,000
Wahluke School District #73	Institutional	4	$5,000,000.00	100%	$20,000,000

Hazard Major Fire -Wildland

Neighborhood Name					
Desert Aire	Residential	650	$110,000.00	100%	$71,500,000
Port of Mattawa	Commercial/Retail	10	$3,000,000.00	100%	$30,000,000
Town of Mattawa	Mixed Use	700	$68,500.00	100%	$47,950,000

Hazard Radiological

Neighborhood Name					
Town of Mattawa	Mixed Use	700	$68,500.00	100%	$47,950,000
Wahluke School District #73	Institutional	4	$5,000,000.00	100%	$20,000,000

Hazard Severe Winter Storm

Neighborhood Name					
Desert Aire	Residential	650	$110,000.00	100%	$71,500,000
Port of Mattawa	Commercial/Retail	10	$3,000,000.00	100%	$30,000,000
Town of Mattawa	Mixed Use	700	$68,500.00	100%	$47,950,000
Wahluke School District #73	Institutional	4	$5,000,000.00	100%	$20,000,000

Hazard Special Hazards

Neighborhood Name					
Town of Mattawa	Mixed Use	700	$68,500.00	50%	$23,975,000
Wahluke School District #73	Institutional	4	$5,000,000.00	50%	$10,000,000

Hazard Telecommunications

Neighborhood Name					
Town of Mattawa	Mixed Use	700	$68,500.00	100%	$47,950,000
Wahluke School District #73	Institutional	4	$5,000,000.00	100%	$20,000,000

Hazard Transportation

Neighborhood Name					
Town of Mattawa	Mixed Use	700	$68,500.00	35%	$16,782,500
Wahluke School District #73	Institutional	4	$5,000,000.00	35%	$7,000,000

Hazard Volcano Activity

Neighborhood Name					
Desert Aire	Residential	650	$110,000.00	100%	$71,500,000
Port of Mattawa	Commercial/Retail	10	$3,000,000.00	100%	$30,000,000
Town of Mattawa	Mixed Use	700	$68,500.00	100%	$47,950,000
Wahluke School District #73	Institutional	4	$5,000,000.00	100%	$20,000,000

	Use	Estimated Number Of Structures	Average Value of Each Structure	Percent of Structures at Risk	Total Estimated Value ($) of Structures at Risk
Royal City					
Hazard Civil Disturbance					
Neighborhood Name					
Port of Royal Slope	Industrial	4	$3,050,000.00	100%	$12,200,000
Royal Camp	Mixed Use	100	$70,000.00	100%	$7,000,000
Royal City	Mixed Use	135	$78,200.00	100%	$10,557,000
Hazard Drought					
Neighborhood Name					
Port of Royal Slope	Industrial	4	$3,050,000.00	100%	$12,200,000
Royal Camp	Mixed Use	100	$70,000.00	100%	$7,000,000
Royal City	Mixed Use	135	$78,200.00	100%	$10,557,000
Hazard Earthquake					
Neighborhood Name					
Port of Royal Slope	Industrial	4	$3,050,000.00	100%	$12,200,000
Royal Camp	Mixed Use	100	$70,000.00	100%	$7,000,000
Royal City	Mixed Use	135	$78,200.00	100%	$10,557,000
Hazard Flooding					
Neighborhood Name					
Port of Royal Slope	Industrial	4	$3,050,000.00	5%	$610,000
Royal Camp	Mixed Use	100	$70,000.00	5%	$350,000
Royal City	Mixed Use	135	$78,200.00	5%	$527,850
Hazard Hail					

Neighborhood Name					
Port of Royal Slope	Industrial	4	$3,050,000.00	100%	$12,200,000
Royal Camp	Mixed Use	100	$70,000.00	100%	$7,000,000

Hazard Hazardous Materials

Neighborhood Name					
Port of Royal Slope	Industrial	4	$3,050,000.00	100%	$12,200,000
Royal Camp	Mixed Use	100	$70,000.00	80%	$5,600,000
Royal City	Mixed Use	135	$78,200.00	100%	$10,557,000

Hazard High Winds

Neighborhood Name					
Port of Royal Slope	Industrial	4	$3,050,000.00	100%	$12,200,000
Royal Camp	Mixed Use	100	$70,000.00	100%	$7,000,000

Hazard Infestation, Disease

Neighborhood Name					
Port of Royal Slope	Industrial	4	$3,050,000.00	100%	$12,200,000
Royal Camp	Mixed Use	100	$70,000.00	100%	$7,000,000
Royal City	Mixed Use	135	$78,200.00	100%	$10,557,000

Hazard Lightning

Neighborhood Name					
Port of Royal Slope	Industrial	4	$3,050,000.00	100%	$12,200,000
Royal Camp	Mixed Use	100	$70,000.00	100%	$7,000,000

Hazard Loss of Electrical Service

Neighborhood Name					
Port of Royal Slope	Industrial	4	$3,050,000.00	100%	$12,200,000
Royal Camp	Mixed Use	100	$70,000.00	100%	$7,000,000
Royal City	Mixed Use	135	$78,200.00	100%	$10,557,000

Hazard Loss of Gas Service

Neighborhood Name					
Royal Camp	Mixed Use	100	$70,000.00	100%	$7,000,000
Royal City	Mixed Use	135	$78,200.00	100%	$10,557,000

Hazard Loss of Sewer Service

Neighborhood Name					
Port of Royal Slope	Industrial	4	$3,050,000.00	40%	$4,880,000
Royal City	Mixed Use	135	$78,200.00	80%	$8,445,600

Hazard Loss of Water Service

Neighborhood Name

Royal Camp	Mixed Use	100	$70,000.00	40%	$2,800,000
Royal City	Mixed Use	135	$78,200.00	90%	$9,501,300

Hazard Major Fire - Urban

Neighborhood Name					
Port of Royal Slope	Industrial	4	$3,050,000.00	100%	$12,200,000
Royal Camp	Mixed Use	100	$70,000.00	100%	$7,000,000
Royal City	Mixed Use	135	$78,200.00	100%	$10,557,000

Hazard Major Fire -Wildland

Neighborhood Name					
Port of Royal Slope	Industrial	4	$3,050,000.00	100%	$12,200,000
Royal Camp	Mixed Use	100	$70,000.00	100%	$7,000,000
Royal City	Mixed Use	135	$78,200.00	100%	$10,557,000

Hazard Major Fire-Urban

Neighborhood Name					
Royal City	Mixed Use	135	$78,200.00	100%	$10,557,000

Hazard Radiological

Neighborhood Name					
Port of Royal Slope	Industrial	4	$3,050,000.00	100%	$12,200,000
Royal Camp	Mixed Use	100	$70,000.00	100%	$7,000,000
Royal City	Mixed Use	135	$78,200.00	100%	$10,557,000

Hazard Severe Winter Storm

Neighborhood Name					
Port of Royal Slope	Industrial	4	$3,050,000.00	100%	$12,200,000
Royal Camp	Mixed Use	100	$70,000.00	100%	$7,000,000
Royal City	Mixed Use	135	$78,200.00	100%	$10,557,000

Hazard Telecommunications

Neighborhood Name					
Port of Royal Slope	Industrial	4	$3,050,000.00	100%	$12,200,000
Royal Camp	Mixed Use	100	$70,000.00	100%	$7,000,000
Royal City	Mixed Use	135	$78,200.00	100%	$10,557,000

Hazard Transportation

Neighborhood Name					
Port of Royal Slope	Industrial	4	$3,050,000.00	100%	$12,200,000
Royal Camp	Mixed Use	100	$70,000.00	10%	$700,000
Royal City	Mixed Use	135	$78,200.00	100%	$10,557,000

Hazard Volcano Activity

Neighborhood Name					
Port of Royal Slope	Industrial	4	$3,050,000.00	100%	$12,200,000
Royal Camp	Mixed Use	100	$70,000.00	100%	$7,000,000
Royal City	Mixed Use	135	$78,200.00	100%	$10,557,000

For future growth trends see **"Appendix A"**
Grant County Rural Land Use Analysis: Population, Housing and UGA Land Allocations (Proulx Cearns, Inc., September 1999)

Port of Royal Slope

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of Port of Royal Slope, fire has been selected as the hazard of concern.

Mitigation Initiative

The pages that follow document the specific hazard mitigation initiative that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
PRS-FIH1	Structure Retrofit	Install water well for additional water and fire suppression flow	1 of 1	$450,000

Governmental Entity:	Port of Royal Slope
Hazard Type:	Fire
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: PRS-FIH1
Install water well for additional water and fire suppression flow

Rationale:
The port of Royal Slope needs additional backup water supply and flow provided by the drilling an additional water well. The well would be located in the 14000 block of Route F SW, Royal City. Expansion of the Port facilities would be hampered by a lack of water flow for fire fighting. Should a fire damage the Port facilities, jobs at the Port and in the community would be eliminated by the failure of the Port tenants to continue operations.

Relates to Plan Goal(s):	2. Reduce property damage 9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	2B. Design and retrofit essential water and sewer services to minimize the potential for disruption during a disaster. 9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.

Implementer:	Port of Royal Slope
Estimated Cost:	$500,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	50.91: 1

Grant County Fire Protection District #10

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of FPD #10, hazard events such as severe winter storms, high winds, utility shortage and lightning have been selected as the hazards of concern.

Mitigation Initiative

The pages that follow document the specific hazard mitigation initiative that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
FPD10-MH1	Structure Retrofit	Backup power generators for the Royal City Fire Station and the radio repeater on Frenchman Hills.	1 of 1	$13,000

Governmental Entity:	Grant County Fire Protection District #10
Hazard Type:	Multi-hazard
Initiative Category:	Structural Retrofit
Priority:	2 of 2

Initiative Nr: FPD10-MH1
Backup power generators for the Royal City Fire Station and the radio repeater on Frenchman Hills.

Rationale:
Stand-by power for the fire station in Royal City and the radio repeater on Frenchman Hills. During a winter storm or other hazard event the Fire Department would become the center for emergency service for surrounding area. Communication by telephone or cell phone might become impossible. That would make this facility and its radio communications capabilities, invaluable.

Relates to Plan Goal(s):	9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed. 9C. Ensure that utility and communications systems

	supporting emergency services operations can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	Fire Chief
Estimated Cost:	$13,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	159.31: 1

City of Royal City

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of City of Royal City, hazard events such as severe winter storms, high winds, lightning, fire, and utility shortage have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
RC-MH1	Structure Retrofit	Pressure Zone O Water System Improvements Phase 1 or Phase 1 City/Port Intertype	1 of 2	$765,000
RC-MH2	Structure Retrofit	Pressure Zone 2N Water System Improvements Phase 1	2 of 2	$300,000

Governmental Entity:	City of Royal City
Hazard Type:	Multi-hazard
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: RC-MH1
Pressure Zone O Water System Improvements Phase 1

Rationale:
Add emergency power generator set, up-grade booster pumps, telemetry up-grade, 16-inch & 12-inch main to Saddle Mountain (Port of Royal) and (Hiawatha Industrial parks), hydrants at 300 foot intervals. A temporary PRV station placed to control pressure in Zone "O". This will provide additional water flow for fire fighting. In addition, with backup power, the water supply will not be interrupted during an outage.

Relates to Plan Goal(s):	2. Reduce property damage 9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	2B. Design and retrofit essential water and sewer services to minimize the potential for disruption during

	a disaster. 9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	City of Royal City, Public Works
Estimated Cost:	$765,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants (CTED< PTF<SRF<USDA-RU)
Implementation Status:	New
Final Cost to Benefit Ratio:	25.5: 1

Governmental Entity:	City of Royal City
Hazard Type:	Multi-hazard
Initiative Category:	Structural Retrofit
Priority:	2 of 2

Initiative Nr: RC-MH2
Pressure Zone 2N Water System Improvements Phase 1

Rationale:
Add Emergency power generator set, up-grade booster pumps, telemetry up-grade, 12-inch main to school property, hydrants at 300 foot intervals to match newly acquired property usage for Pressure Zone 2N. Persuade school to up grade pipes to meet the 3000 GPM/one hour code. This will provide additional water flow for fire fighting. In addition, with backup power, the water supply will not be interrupted during an outage.

Relates to Plan Goal(s):	2. Reduce property damage 9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	2B. Design and retrofit essential water and sewer services to minimize the potential for disruption during a disaster. 9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate

	these facilities, as needed.
Implementer:	City of Royal City, Public Works
Estimated Cost:	$300,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants (CTED< PTF<SRF<USDA-RU)
Implementation Status:	New
Final Cost to Benefit Ratio:	69.06: 1

Wahluke School District #73

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of the Wahluke School District, hazard events such as severe winter storms, high winds, utility shortage and lightning have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
WSD-MH1	Structure Retrofit	Morris Schott Middle School Emergency Power	1 of 1	$25,000

Governmental Entity:	Wahluke School District #73
Hazard Type:	Multi-hazard
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: WSD-MH1
Morris Schott Middle School Emergency Power

Rationale:
A backup power generator would allow the Morris Schott Middle School to be used as an emergency shelter in a short or long-term incident. Having backup power would allow the school to keep children at their facilities. During hazard events, or other disasters, that would cause the electrical power to fail, the Middle School could provide a place for area residents to go that would have lighting, heat, and other necessary facilities necessary to shelter them for extended periods of time.

Relates to Plan Goal(s):	9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	Facilities Manager

Estimated Cost:	$25,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	8.25: 1

Grant County Hospital District #5

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of GCHD5, natural hazard events such as severe winter storms, high winds, earthquake, land movement and lightning have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
GCHD5-MH1	Other Non-structural	Community Response Teams to check the Homebound	1 of 2	$6,000
GCHD5-MH2	Structure Retrofit	Backup Power Generator	2 of 2	

Governmental Entity:	Grant County Hospital District #5
Hazard Type:	Multi-hazard
Initiative Category:	Structural
Priority:	1 of 2

Initiative Nr: GCHD5-MH1
Community Response Teams to check the Homebound

Rationale:

Before the time of a natural disaster a list of people in the Mattawa area will be developed and areas sectioned off and emergency response team members will go to the homes and check on homebound people to see if they need food or water or need a ride to the shelter. Emergency response teams will be volunteers from the community and will coordinate with a team leader to make sure that there is an accounting of all homebound people.

Relates to Plan Goal(s):	1. Prevent loss of life and injuries 4. Improve hazard assessment information and data.
Relates to Plan Objective(s):	1B. Ensure there are adequate systems in place to provide emergency instructions during a disaster. 4B. Ensure there are adequate systems in place to provide emergency instructions during a disaster.

Implementer:	Hospital District CEO
Estimated Cost:	$6,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	34.62: 1

Governmental Entity:	Grant County Hospital District #5
Hazard Type:	Multi-hazard
Initiative Category:	Structural Retrofit
Priority:	2 of 2

Initiative Nr: GCHD5-MH2
Procure, install emergency electrical generator at the Mattawa Clinic.

Rationale:
Install emergency backup generator to be used to maintain operations at the Mattawa Clinic during outages. In the Mattawa area, the clinic provides routine and emergency medical assistance. The nearest hospital is over an hour's drive away. People in medical distress during an emergency may not be able to travel to the nearest hospital. In that case, the Mattawa clinic would provide vital emergency medical services. Without reliable electric power that can be sustained the Clinic would have difficulty operating and needed refrigerated medical supplies might spoil.

Relates to Plan Goal(s):	9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	Hospital District CEO

Estimated Cost:	$10,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	13.33: 1

Town of Mattawa

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of Town of Mattawa, hazard events such as severe winter storms, high winds, lightning, fire, and utility shortage have been selected as the hazards of concern.

Mitigation Initiative

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
M-MH1	Structure Retrofit	Install water well to provide additional drinking water and fire suppression flow	1 of 1	$50,000

Governmental Entity:	Town of Mattawa
Hazard Type:	Multi-hazard
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: M-MH1
Install water well to provide additional drinking water and fire suppression flow

Install generator for standby emergency power for town wells #1 and #3 located at 709 First St. in Mattawa. These wells provide drinking water and fire flow to the residents of the town. The town has residential areas served by these wells, along with industrial and retail customers.

Relates to Plan Goal(s):	2. Reduce property damage 9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	2B. Design and retrofit essential water and sewer services to minimize the potential for disruption during a disaster. 9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	Town of Mattawa, Public Works

Estimated Cost:	$50,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	50: 1

Grant County Fire Protection District #8

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of FPD #8, hazard events such as severe winter storms, high winds, utility shortage and lightning have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
FPD8-MH1	Structure Retrofit	Backup Power Generators	1 of 1	$30,000

Governmental Entity:	Grant County Fire Protection District #8
Hazard Type:	Multi-hazard
Initiative Category:	Structural
Priority:	1 of 1

Initiative Nr: FPD8-MH1

Procure, install emergency electrical generators for the three fire stations in the protection district

Rationale:
With the loss of electrical power at our three fire stations for a sustained period of time, equipment may freeze and cause a high dollar loss. Communications will not work, computers may not be used and emergency service would come to a halt. Fire crews will have limited use of the station without power.

Relates to Plan Goal(s):	9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	Fire Chief

Estimated Cost:	$30,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	520: 1

Port of Mattawa

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of Port of Mattawa, fire has been selected as the hazard of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
PM-FIH1	Structure Retrofit	Develop water well for additional fire suppression flow	1 of 1	$450,000

Governmental Entity:	Port of Mattawa
Hazard Type:	Multi-hazard
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: PW-FIH1
Install water well for additional fire suppression flow

Rationale:
Developing water well and tying into the Town of Mattawa system will supply additional fire suppression water flow. The Port provides essential facilities that serve agriculture and business. For the Port to continue to expand and grow in this economically depressed area additional water must be readily available for fire fighting. This well would provide that water flow. Since the water system to the Port is linked to the Town of Mattawa they would also benefit from this well.

Relates to Plan Goal(s):	2. Reduce property damage 9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	2B. Design and retrofit essential water and sewer services to minimize the potential for disruption during a disaster. 9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	Port of Mattawa

Estimated Cost:	$450,000
Time Period:	2006-2010
Funding Source:	Well has already cost $45,000, other funding to finish project will be sought from grants along with acquiring $30,000 in County SIP funds. Long term financing.
Implementation Status:	New
Final Cost to Benefit Ratio:	11.43: 1

Ephrata-Soap Lake Region

Municipal Area	Participating Jurisdiction
Ephrata	City of Ephrata
	Port of Ephrata
	Ephrata School District
Soap Lake	City of Soap Lake
	Soap Lake School District
	Fire Protection District #7

Grant County consists of over sixty taxing districts, including municipalities, port districts, fire districts, and others led, in most cases, by volunteers or part-time officials. These diverse entities, with overlapping jurisdictions, often work regionally to address challenges including those caused by natural and manmade hazards. In the palling process we used regional approaches to identify an area's particular hazards and to assess their regional vulnerability to them. The following Hazard Identification and Vulnerability matrix was developed by the Hazard Mitigation Task Force members from the Ephrata-Soap Lake-Wilson Creek Region.

The purpose of this section of the plan is to assess the vulnerability to the Ephrata-Soap Lake Region of Grant County in regards to the various hazards previously identified in Chapter 2. In addition, mitigation strategies that are currently in place relating to these hazards as well as newly proposed mitigation strategies have been included in this section of the plan. To complete the vulnerability assessment process, various county staff utilized a series of forms available in the 20/20 Mitigation Software. The information collected with these forms is included in this portion of the plan.

As part of the vulnerability assessment process, officials completed an inventory of all critical facilities and have considered these critical facilities in their planning and mitigation strategy development process. *At this point, the planning process has identified over 200 critical facilities in Grant County.* However, due to post 9/11 concerns, those facilities are not listed in this document. In addition, further action will be taken to document these facilities with both photographs and Global Positioning System (GPS) coordinates in a Geographical Information Services (GIS) mapping. A list of these facilities will be made available to FEMA personnel in the event this information is required to obtain future hazard mitigation grant funding.

Representatives from local government worked closely with other agencies and Grant County Emergency Management staff to develop a comprehensive, coordinated mitigation plan intended to reduce the vulnerability to hazards within the Ephrata-Soap Lake-Wilson Creek Region of Grant County. This document presents the results of this effort to identify the specific hazards threatening the Ephrata-Soap Lake and to identify current as well as proposed mitigation strategies, projects and/or programs to address identified vulnerabilities.

The assessment is based on the best currently available information and data regarding the characteristics of the neighborhoods identified, the hazards that threaten the people, property, and environment of these neighborhoods as well as the impacts these neighborhoods have suffered in past disasters. This information includes, when available, United States Census data, local tax records, local and national

geographic information system data, Flood Insurance Rate Maps, hazard specific analyses, and other environmental and demographic facts.

However, very often authoritative or current information simply was not available for the planning effort. In these cases, the experience, knowledge and judgment of local officials were used in the planning, including assumptions and approximations that were believed to be reasonable. In addition, straight-forward, simplified technical analyses were used for tasks such as estimating property values, determining the size of populations affected, and so forth. The reliance on the judgment of knowledgeable officials and simplified analyses is considered acceptable at this stage to allow the participating organizations to complete the tasks needed to develop this multi-jurisdictional hazard mitigation plan. As the planning continues in future years, or at the time when a proposed mitigation initiative is intended to be funded and/or implemented, the participating organizations/jurisdictions recognize that additional information and analyses may be required. Local government is committed to the implementation of the mitigation-related projects/programs described in this section of the plan when and if resources become available. Local government is also committed to continuing the mitigation planning process that has resulted in the development of this document, and to the ongoing cooperation with other agencies, organizations, and jurisdictions to make Grant County more resistant to the damages and hardships that could otherwise be the result of future disasters.

Ephrata-Soap Lake Overview

City of Ephrata

Contact Information:
Wes Crago, City Administrator
121 Alder St. SW
Ephrata, Washington 98823
Telephone: (509) 754-6961
Population of Jurisdiction: 6,956 and increasing slightly
Principal Economic Base: Institutional
Economic Characteristic: Economically disadvantaged

Jurisdiction-Specific Vulnerability Assessment & Mitigation Strategies

Current Hazard Mitigation Codes/Plans/Ordinances:

- Comprehensive Land Use Plan
- Adopted Land Use/Zoning Code
- Adopted Building Code (2003 International Building Code)
- Adopted Fire Safety Code (Universal Fire Code)
- Participation in the National Flood Program
- Participation in NFIP Program CRS Rating 8

Ephrata Current Land Uses and Potential for New Development

Current Land Use Category	Percent of Jurisdiction
Commercial	30%
Industrial	10%
Residential	60%

35% of the City of Ephrata is still open to development. Little or no development is occurring and expansion, development or construction of existing properties is occurring to very few or no properties.

City of Soap Lake

Contact Information:
Wayne Hovde, Mayor
City of Soap Lake
P.O. Box 1270
Soap Lake, WA 98851
Telephone: (509) 246-1211
Population of Jurisdiction: 1750 and increasing slightly
Principal Economic Base: Institutional
Economic Characteristic: Economically disadvantaged

Jurisdiction-Specific Vulnerability Assessment & Mitigation Strategies

Current Hazard Mitigation Codes/Plans/Ordinances:

- Comprehensive Land Use Plan
- Adopted Land Use/Zoning Code
- Adopted Building Code (International Building Code)
- Participates in the NFIP Program CRS Rating 7

Soap Lake Land Uses and Potential for New Development

Current Land Use Categories:	Percent of Jurisdiction
Commercial	10%
Institutional	20%
Parks/restricted wild land	10%
Residential	40%
Waterway/lake/wetland	5%
Other	5%

30% of the City of Soap Lake is still open to development. Little or no development is occurring and expansion, development or construction of existing properties is occurring to very few or no properties.

Current Land Use Categories:	Percent of Jurisdiction
Residential	80%
Commercial	10%
Institutional	2%
Mixed Use	8%

10% of the City of Soap Lake is still open to development. Little or no development is occurring and expansion, development or construction of existing properties is occurring to very few or no properties.

Comparison of Jurisdictional Relative Risk: Ephrata-Soap Lake-Wilson Creek Region

Hazard	Probability of Occurrence	Impacted Area	Health & Safety Impacts	Property Impacts	Environmental Impacts	Economic Impacts	Total Hazard Rating
Natural	Total Natural Hazard Risk Rating: **318**						
Drought	4	4	1	1	2	2	**40**
Earthquake	4	1	1	1	0	1	**7**
Flooding	2	4	1	2	2	2	**36**
Hail	4	1	0	2	2	3	**11**
High Winds	4	5	1	2	2	2	**55**
Landslide, Erosion	2	1	1	1	1	1	**6**
Lightning	4	5	1	1	0	2	**30**
Major Fire – Urban	4	4	1	2	0	2	**36**
Major Fire – Wildland	1	5	1	1	1	1	**25**
Severe Winter Storm	4	5	1	1	1	1	**40**
Volcano Activity	4	4	1	1	1	1	**32**
Technological	Total Technological Hazard Risk Rating: **201**						
Civil Disturbance	1	1	1	1	1	1	**5**
Communications	2	4	1	1	1	3	**20**
Hazardous Materials	2	3	1	2	2	2	**20**
Loss of Electrical	2	4	1	1	1	2	**18**
Loss of Gas / Fuel	2	3	1	1	1	2	**16**
Loss of Sewer	2	4	1	1	2	3	**22**
Loss of Water	2	4	1	1	2	2	**20**
Radiological	2	4	2	1	2	3	**24**
Special Hazards	3	3	2	3	2	2	**36**
Transportation	2	4	1	1	1	3	**20**

Total relative risk for this region: 519

Note: See table below for explanation of ratings.

Impact Area		*Probability of Occurrence*		*Health & Safety Impacts*	
0	No developed area impacted	1	Unknown but rare occurrence	0	No Health and Safety impact
1	Less that 25% of developed areas impacted	2	Unknown but anticipate an occurrence	1	Few injuries/illnesses
2	Less than 50% of developed area impacted	3	100 years or less occurrence	2	Few fatalities but many injuries/illnesses
3	Less than 75% of developed area impacted	4	25 years or less occurrence	3	Numerous fatalities
4	Over 75% of developed area impacted	5	Once a year or more occurrence		

Property Impacts		*Environmental Impacts*		*Economic Impacts*	
0	No property damage	0	Little or no environmental damage	0	No economic impact
1	Few properties destroyed - few properties damaged	1	Resources damaged with short term recovery practical	1	Low direct and/or low indirect costs
2	Few destroyed - many damaged	2	Resources damaged with long term recovery feasible	2	High direct & low indirect costs

2	Few damaged - many destroyed	3	Resources destroyed beyond recovery	2	Low direct & high indirect costs
3	Many properties destroyed and damaged			3	High direct && high indirect costs

Property at Risk

To make jurisdiction-wide analysis of the dollar value of properties at risk for each hazard type feasible and practical for mitigation planning purposes, a simplified approach has been used. The estimate of the dollar value of properties at risk for specific hazards is accomplished in the following manner: The number of structures in a specific neighborhood and the average dollar value for those structures is estimated by local planners, based on readily available data or their best judgment in the absence of suitable data.

(Note: In many cases the median value was used from recent census data when the average value was not readily available. This average value of the residences in a neighborhood somewhat undervalues the property at risk.) The percentage of the specific neighborhood threatened by the identified hazard is then estimated by local planners, again based on readily available data or their best judgment. The percent of the neighborhood at risk is then used as a multiplier to determine the estimated number of structures at risk from that hazard. This number is then multiplied by the estimated average cost of the structures to derive an estimated total value of the property at risk of damage in that neighborhood from the identified hazard. The methodology is simplistic but conservative in that it assumes structures are uniformly distributed throughout the neighborhood in relation to the area of risk that the hazard threatens the entire value of each structure, and that structures are equally vulnerable to the impacts of the hazard. The derived estimates for the dollar value of property at risk may therefore be higher than would actually be the case, but the estimates are considered satisfactory to support the local mitigation planning process.

People at Risk

The estimated total populations for each neighborhood by jurisdiction are given in the table below which are determined by local planners through readily available data or their best judgment in the absence of suitable data. If a person wanted to determine the percentage of the population at risk in a particular neighborhood, the following method should be used: multiply the percent of structures at risk by the total estimated neighborhood population. The methodology is simplistic but conservative in that it assumes occupied structures are uniformly distributed throughout the neighborhood in relation to the area of risk, that the population is present on a 24 hour, 7 day basis, and that all individuals are equally vulnerable to the impacts of the hazard event. Therefore, an estimation of the percentage of a population at risk may be higher than is actually the case, but is considered satisfactory to support the local mitigation planning process.

Grant County
Mitigation 20/20 Task ™
Estimated Value of Structures at Risk, by

	Use	Estimated Number Of Structures	Average Value of Each Structure	Percent of Structures at Risk	Total Estimated Value ($) of Structures at Risk
Ephrata					
Hazard Civil Disturbance					
Neighborhood Name					
Central Business District	Mixed Use	500	$150,000.00	75%	$56,250,000
Ephrata City	Mixed Use	1560	$128,000.00	100%	$199,680,000
Ephrata Heights	Residential	900	$120,000.00	50%	$54,000,000
Grandview Heights	Residential	300	$128,000.00	50%	$19,200,000
Northwest Ephrata Flats	Residential	300	$120,000.00	100%	$36,000,000
Oasis Park Area	Mixed Use	100	$120,000.00	50%	$6,000,000
Orchard View Homes	Residential	75	$150,000.00	50%	$5,625,000
Southwest Ephrata Flats	Residential	475	$120,000.00	50%	$28,500,000
St. Rose School Area	Residential	350	$110,000.00	50%	$19,250,000
Swanson Addition	Residential	200	$110,000.00	50%	$11,000,000
Hazard Drought					
Neighborhood Name					
Central Business District	Mixed Use	500	$150,000.00	100%	$75,000,000
Ephrata City	Mixed Use	1560	$128,000.00	100%	$199,680,000
Ephrata Heights	Residential	900	$120,000.00	100%	$108,000,000
Northwest Ephrata Flats	Residential	300	$120,000.00	100%	$36,000,000
Oasis Park Area	Mixed Use	100	$120,000.00	100%	$12,000,000
Orchard View Homes	Residential	75	$150,000.00	100%	$11,250,000
Port of Ephrata	Transportation	31	$295,000.00	100%	$9,145,000
Southwest Ephrata Flats	Residential	475	$120,000.00	100%	$57,000,000
St. Rose School Area	Residential	350	$110,000.00	100%	$38,500,000
Swanson Addition	Residential	200	$110,000.00	100%	$22,000,000
Hazard Earthquake					
Neighborhood Name					

Central Business District	Mixed Use	500	$150,000.00	100%	$75,000,000
Ephrata City	Mixed Use	1560	$128,000.00	100%	$199,680,000
Ephrata Heights	Residential	900	$120,000.00	100%	$108,000,000
Grandview Heights	Residential	300	$128,000.00	100%	$38,400,000
Northwest Ephrata Flats	Residential	300	$120,000.00	100%	$36,000,000
Oasis Park Area	Mixed Use	100	$120,000.00	100%	$12,000,000
Orchard View Homes	Residential	75	$150,000.00	100%	$11,250,000
Port of Ephrata	Transportation	31	$295,000.00	100%	$9,145,000
Southwest Ephrata Flats	Residential	475	$120,000.00	100%	$57,000,000
St. Rose School Area	Residential	350	$110,000.00	100%	$38,500,000
Swanson Addition	Residential	200	$110,000.00	100%	$22,000,000

Hazard Flooding

Neighborhood Name					
Central Business District	Mixed Use	500	$150,000.00	50%	$37,500,000
Ephrata City	Mixed Use	1560	$128,000.00	100%	$199,680,000
Ephrata Heights	Residential	900	$120,000.00	5%	$5,400,000
Grandview Heights	Residential	300	$128,000.00	5%	$1,920,000
Northwest Ephrata Flats	Residential	300	$120,000.00	50%	$18,000,000
Oasis Park Area	Mixed Use	100	$120,000.00	50%	$6,000,000
Orchard View Homes	Residential	75	$150,000.00	5%	$562,500
Port of Ephrata	Transportation	31	$295,000.00	100%	$9,145,000
Southwest Ephrata Flats	Residential	475	$120,000.00	50%	$28,500,000
St. Rose School Area	Residential	350	$110,000.00	5%	$1,925,000
Swanson Addition	Residential	200	$110,000.00	5%	$1,100,000

Hazard Hail

Neighborhood Name					
Central Business District	Mixed Use	500	$150,000.00	15%	$11,250,000
Ephrata City	Mixed Use	1560	$128,000.00	100%	$199,680,000
Ephrata Heights	Residential	900	$120,000.00	10%	$10,800,000
Grandview Heights	Residential	300	$128,000.00	10%	$3,840,000
Northwest Ephrata Flats	Residential	300	$120,000.00	15%	$5,400,000
Orchard View Homes	Residential	75	$150,000.00	15%	$1,687,500
Port of Ephrata	Transportation	31	$295,000.00	100%	$9,145,000
Southwest Ephrata Flats	Residential	475	$120,000.00	15%	$8,550,000
St. Rose School Area	Residential	350	$110,000.00	15%	$5,775,000
Swanson Addition	Residential	200	$110,000.00	15%	$3,300,000

Hazard Hazardous Materials

Neighborhood Name					
Central Business District	Mixed Use	500	$150,000.00	50%	$37,500,000
Ephrata City	Mixed Use	1560	$128,000.00	50%	$99,840,000
Ephrata Heights	Residential	900	$120,000.00	50%	$54,000,000
Grandview Heights	Residential	300	$128,000.00	50%	$19,200,000
Northwest Ephrata Flats	Residential	300	$120,000.00	50%	$18,000,000
Orchard View Homes	Residential	75	$150,000.00	50%	$5,625,000
Southwest Ephrata Flats	Residential	475	$120,000.00	50%	$28,500,000
St. Rose School Area	Residential	350	$110,000.00	50%	$19,250,000
Swanson Addition	Residential	200	$110,000.00	50%	$11,000,000

Hazard High Winds

Neighborhood Name					
Central Business District	Mixed Use	500	$150,000.00	25%	$18,750,000
Ephrata City	Mixed Use	1560	$128,000.00	100%	$199,680,000
Ephrata Heights	Residential	900	$120,000.00	75%	$81,000,000
Grandview Heights	Residential	300	$128,000.00	75%	$28,800,000
Northwest Ephrata Flats	Residential	300	$120,000.00	25%	$9,000,000
Oasis Park Area	Mixed Use	100	$120,000.00	50%	$6,000,000
Orchard View Homes	Residential	75	$150,000.00	50%	$5,625,000
Port of Ephrata	Transportation	31	$295,000.00	100%	$9,145,000
Southwest Ephrata Flats	Residential	475	$120,000.00	25%	$14,250,000
St. Rose School Area	Residential	350	$110,000.00	75%	$28,875,000
Swanson Addition	Residential	200	$110,000.00	50%	$11,000,000

Hazard Lightning

Neighborhood Name					
Central Business District	Mixed Use	500	$150,000.00	5%	$3,750,000
Ephrata City	Mixed Use	1560	$128,000.00	100%	$199,680,000
Ephrata Heights	Residential	900	$120,000.00	5%	$5,400,000
Grandview Heights	Residential	300	$128,000.00	5%	$1,920,000
Northwest Ephrata Flats	Residential	300	$120,000.00	5%	$1,800,000
Oasis Park Area	Mixed Use	100	$120,000.00	5%	$600,000
Orchard View Homes	Residential	75	$150,000.00	5%	$562,500
Port of Ephrata	Transportation	31	$295,000.00	100%	$9,145,000
Southwest Ephrata Flats	Residential	475	$120,000.00	5%	$2,850,000
St. Rose School Area	Residential	350	$110,000.00	5%	$1,925,000
Swanson Addition	Residential	200	$110,000.00	5%	$1,100,000

Hazard Loss of Electrical Service

Neighborhood Name					
Central Business District	Mixed Use	500	$150,000.00	99%	$74,250,000
Ephrata City	Mixed Use	1560	$128,000.00	99%	$197,683,200
Ephrata Heights	Residential	900	$120,000.00	99%	$106,920,000
Grandview Heights	Residential	300	$128,000.00	99%	$38,016,000
Northwest Ephrata Flats	Residential	300	$120,000.00	99%	$35,640,000
Oasis Park Area	Mixed Use	100	$120,000.00	99%	$11,880,000
Orchard View Homes	Residential	75	$150,000.00	99%	$11,137,500
Southwest Ephrata Flats	Residential	475	$120,000.00	99%	$56,430,000
St. Rose School Area	Residential	350	$110,000.00	99%	$38,115,000
Swanson Addition	Residential	200	$110,000.00	99%	$21,780,000

Hazard Loss of Gas Service

Neighborhood Name					
Central Business District	Mixed Use	500	$150,000.00	90%	$67,500,000
Ephrata City	Mixed Use	1560	$128,000.00	90%	$179,712,000
Ephrata Heights	Residential	900	$120,000.00	90%	$97,200,000
Grandview Heights	Residential	300	$128,000.00	90%	$34,560,000
Northwest Ephrata Flats	Residential	300	$120,000.00	90%	$32,400,000
Oasis Park Area	Mixed Use	100	$120,000.00	90%	$10,800,000
Orchard View Homes	Residential	75	$150,000.00	90%	$10,125,000
St. Rose School Area	Residential	350	$110,000.00	90%	$34,650,000
Swanson Addition	Residential	200	$110,000.00	90%	$19,800,000

Hazard Loss of Sewer Service

Neighborhood Name					
Central Business District	Mixed Use	500	$150,000.00	98%	$73,500,000
Ephrata Heights	Residential	900	$120,000.00	98%	$105,840,000
Grandview Heights	Residential	300	$128,000.00	98%	$37,632,000
Northwest Ephrata Flats	Residential	300	$120,000.00	98%	$35,280,000
Oasis Park Area	Mixed Use	100	$120,000.00	98%	$11,760,000
Orchard View Homes	Residential	75	$150,000.00	98%	$11,025,000
Southwest Ephrata Flats	Residential	475	$120,000.00	98%	$55,860,000
St. Rose School Area	Residential	350	$110,000.00	98%	$37,730,000
Swanson Addition	Residential	200	$110,000.00	98%	$21,560,000

Hazard Loss of Water Service

Neighborhood Name					
Central Business District	Mixed Use	500	$150,000.00	98%	$73,500,000
Ephrata Heights	Residential	900	$120,000.00	98%	$105,840,000

Grandview Heights	Residential	300	$128,000.00	98%	$37,632,000
Oasis Park Area	Mixed Use	100	$120,000.00	98%	$11,760,000
Orchard View Homes	Residential	75	$150,000.00	98%	$11,025,000
Southwest Ephrata Flats	Residential	475	$120,000.00	98%	$55,860,000
St. Rose School Area	Residential	350	$110,000.00	98%	$37,730,000
Swanson Addition	Residential	200	$110,000.00	98%	$21,560,000

Hazard Major Fire - Urban

Neighborhood Name					
Central Business District	Mixed Use	500	$150,000.00	40%	$30,000,000
Ephrata Heights	Residential	900	$120,000.00	25%	$27,000,000
Grandview Heights	Residential	300	$128,000.00	25%	$9,600,000
Port of Ephrata	Transportation	31	$295,000.00	100%	$9,145,000

Hazard Major Fire -Wildland

Neighborhood Name					
Central Business District	Mixed Use	500	$150,000.00	20%	$15,000,000
Ephrata City	Mixed Use	1560	$128,000.00	100%	$199,680,000
Ephrata Heights	Residential	900	$120,000.00	25%	$27,000,000
Grandview Heights	Residential	300	$128,000.00	25%	$9,600,000
Northwest Ephrata Flats	Residential	300	$120,000.00	20%	$7,200,000
Oasis Park Area	Mixed Use	100	$120,000.00	50%	$6,000,000
Orchard View Homes	Residential	75	$150,000.00	50%	$5,625,000
Port of Ephrata	Transportation	31	$295,000.00	100%	$9,145,000
Southwest Ephrata Flats	Residential	475	$120,000.00	25%	$14,250,000
St. Rose School Area	Residential	350	$110,000.00	25%	$9,625,000
Swanson Addition	Residential	200	$110,000.00	25%	$5,500,000

Hazard Major Fire-Urban

Neighborhood Name					
Ephrata City	Mixed Use	1560	$128,000.00	25%	$49,920,000
Northwest Ephrata Flats	Residential	300	$120,000.00	20%	$7,200,000
Oasis Park Area	Mixed Use	100	$120,000.00	20%	$2,400,000
Orchard View Homes	Residential	75	$150,000.00	25%	$2,812,500
Southwest Ephrata Flats	Residential	475	$120,000.00	30%	$17,100,000
St. Rose School Area	Residential	350	$110,000.00	25%	$9,625,000
Swanson Addition	Residential	200	$110,000.00	25%	$5,500,000

Hazard Radiological

Neighborhood Name

Central Business District	Mixed Use	500	$150,000.00	100%	$75,000,000
Ephrata City	Mixed Use	1560	$128,000.00	100%	$199,680,000
Ephrata Heights	Residential	900	$120,000.00	100%	$108,000,000
Grandview Heights	Residential	300	$128,000.00	100%	$38,400,000
Northwest Ephrata Flats	Residential	300	$120,000.00	100%	$36,000,000
Oasis Park Area	Mixed Use	100	$120,000.00	100%	$12,000,000
Orchard View Homes	Residential	75	$150,000.00	100%	$11,250,000
Southwest Ephrata Flats	Residential	475	$120,000.00	100%	$57,000,000
St. Rose School Area	Residential	350	$110,000.00	100%	$38,500,000
Swanson Addition	Residential	200	$110,000.00	100%	$22,000,000

Hazard Severe Winter Storm

Neighborhood Name					
Central Business District	Mixed Use	500	$150,000.00	99%	$74,250,000
Ephrata City	Mixed Use	1560	$128,000.00	100%	$199,680,000
Ephrata Heights	Residential	900	$120,000.00	99%	$106,920,000
Grandview Heights	Residential	300	$128,000.00	99%	$38,016,000
Northwest Ephrata Flats	Residential	300	$120,000.00	99%	$35,640,000
Oasis Park Area	Mixed Use	100	$120,000.00	99%	$11,880,000
Orchard View Homes	Residential	75	$150,000.00	99%	$11,137,500
Port of Ephrata	Transportation	31	$295,000.00	100%	$9,145,000
Southwest Ephrata Flats	Residential	475	$120,000.00	99%	$56,430,000
St. Rose School Area	Residential	350	$110,000.00	99%	$38,115,000
Swanson Addition	Residential	200	$110,000.00	99%	$21,780,000

Hazard Special Hazards

Neighborhood Name					
Central Business District	Mixed Use	500	$150,000.00	50%	$37,500,000
Ephrata City	Mixed Use	1560	$128,000.00	50%	$99,840,000
Ephrata Heights	Residential	900	$120,000.00	5%	$5,400,000
Northwest Ephrata Flats	Residential	300	$120,000.00	5%	$1,800,000
Oasis Park Area	Mixed Use	100	$120,000.00	5%	$600,000
Orchard View Homes	Residential	75	$150,000.00	5%	$562,500
Southwest Ephrata Flats	Residential	475	$120,000.00	10%	$5,700,000
St. Rose School Area	Residential	350	$110,000.00	5%	$1,925,000
Swanson Addition	Residential	200	$110,000.00	5%	$1,100,000

Hazard Telecommunications

Neighborhood Name					
Central Business District	Mixed Use	500	$150,000.00	80%	$60,000,000

Ephrata City	Mixed Use	1560	$128,000.00	80%	$159,744,000
Ephrata Heights	Residential	900	$120,000.00	80%	$86,400,000
Grandview Heights	Residential	300	$128,000.00	80%	$30,720,000
Northwest Ephrata Flats	Residential	300	$120,000.00	80%	$28,800,000
Oasis Park Area	Mixed Use	100	$120,000.00	80%	$9,600,000
Orchard View Homes	Residential	75	$150,000.00	80%	$9,000,000
Southwest Ephrata Flats	Residential	475	$120,000.00	80%	$45,600,000
St. Rose School Area	Residential	350	$110,000.00	80%	$30,800,000
Swanson Addition	Residential	200	$110,000.00	80%	$17,600,000

Hazard Transportation

Neighborhood Name					
Central Business District	Mixed Use	500	$150,000.00	75%	$56,250,000
Ephrata City	Mixed Use	1560	$128,000.00	75%	$149,760,000
Ephrata Heights	Residential	900	$120,000.00	75%	$81,000,000
Grandview Heights	Residential	300	$128,000.00	75%	$28,800,000
Northwest Ephrata Flats	Residential	300	$120,000.00	75%	$27,000,000
Oasis Park Area	Mixed Use	100	$120,000.00	75%	$9,000,000
Orchard View Homes	Residential	75	$150,000.00	75%	$8,437,500
Southwest Ephrata Flats	Residential	475	$120,000.00	75%	$42,750,000
St. Rose School Area	Residential	350	$110,000.00	75%	$28,875,000
Swanson Addition	Residential	200	$110,000.00	75%	$16,500,000

Hazard Volcano Activity

Neighborhood Name					
Central Business District	Mixed Use	500	$150,000.00	100%	$75,000,000
Ephrata City	Mixed Use	1560	$128,000.00	100%	$199,680,000
Ephrata Heights	Residential	900	$120,000.00	100%	$108,000,000
Grandview Heights	Residential	300	$128,000.00	100%	$38,400,000
Northwest Ephrata Flats	Residential	300	$120,000.00	100%	$36,000,000
Oasis Park Area	Mixed Use	100	$120,000.00	100%	$12,000,000
Orchard View Homes	Residential	75	$150,000.00	100%	$11,250,000
Port of Ephrata	Transportation	31	$295,000.00	100%	$9,145,000
Southwest Ephrata Flats	Residential	475	$120,000.00	100%	$57,000,000
St. Rose School Area	Residential	350	$110,000.00	100%	$38,500,000
Swanson Addition	Residential	200	$110,000.00	100%	$22,000,000

	Use	Estimated Number Of Structures	Average Value of Each Structure	Percent of Structures at Risk	Total Estimated Value ($) of Structures at Risk
Soap Lake					
Hazard Civil Disturbance					
Neighborhood Name					
City of Soap Lake	Mixed Use	800	$74,500.00	100%	$59,600,000
Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	5%	$875,000
Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	5%	$1,615,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	5%	$1,710,000
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	10%	$1,600,000
Hazard Drought					
Neighborhood Name					
Blue Lake Community (Grant Co. FD #7)	Residential	120	$190,000.00	100%	$22,800,000
City of Soap Lake	Mixed Use	800	$74,500.00	100%	$59,600,000
Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	100%	$17,500,000
Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	100%	$32,300,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	100%	$34,200,000
Rim Rock Cove (Grant Co. FD #7)	Residential	85	$35,000.00	100%	$2,975,000
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	100%	$16,000,000
Hazard Earthquake					
Neighborhood Name					
Blue Lake Community (Grant Co. FD #7)	Residential	120	$190,000.00	100%	$22,800,000
City of Soap Lake	Mixed Use	800	$74,500.00	100%	$59,600,000
Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	100%	$17,500,000

Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	100%	$32,300,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	100%	$34,200,000
Rim Rock Cove (Grant Co. FD #7)	Residential	85	$35,000.00	100%	$2,975,000
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	100%	$16,000,000

Hazard Flooding

Neighborhood Name					
Blue Lake Community (Grant Co. FD #7)	Residential	120	$190,000.00	5%	$1,140,000
City of Soap Lake	Mixed Use	800	$74,500.00	95%	$56,620,000
Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	5%	$875,000
Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	5%	$1,615,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	5%	$1,710,000
Rim Rock Cove (Grant Co. FD #7)	Residential	85	$35,000.00	20%	$595,000
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	5%	$800,000

Hazard Hail

Neighborhood Name					
Blue Lake Community (Grant Co. FD #7)	Residential	120	$190,000.00	100%	$22,800,000
City of Soap Lake	Mixed Use	800	$74,500.00	100%	$59,600,000
Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	100%	$17,500,000
Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	100%	$32,300,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	100%	$34,200,000
Rim Rock Cove (Grant Co. FD #7)	Residential	85	$35,000.00	100%	$2,975,000

Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	100%	$16,000,000

Hazard Hazardous Materials

Neighborhood Name					
Blue Lake Community (Grant Co. FD #7)	Residential	120	$190,000.00	10%	$2,280,000
City of Soap Lake	Mixed Use	800	$74,500.00	80%	$47,680,000
Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	15%	$2,625,000
Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	15%	$4,845,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	50%	$17,100,000
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	5%	$800,000

Hazard High Winds

Neighborhood Name					
Blue Lake Community (Grant Co. FD #7)	Residential	120	$190,000.00	100%	$22,800,000
City of Soap Lake	Mixed Use	800	$74,500.00	100%	$59,600,000
Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	100%	$17,500,000
Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	100%	$32,300,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	100%	$34,200,000
Rim Rock Cove (Grant Co. FD #7)	Residential	85	$35,000.00	100%	$2,975,000
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	100%	$16,000,000

Hazard Lightning

Neighborhood Name					
Blue Lake Community (Grant Co. FD #7)	Residential	120	$190,000.00	100%	$22,800,000
City of Soap Lake	Mixed Use	800	$74,500.00	100%	$59,600,000

Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	100%	$17,500,000
Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	100%	$32,300,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	100%	$34,200,000
Rim Rock Cove (Grant Co. FD #7)	Residential	85	$35,000.00	100%	$2,975,000
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	100%	$16,000,000

Hazard Loss of Electrical Service

Neighborhood Name					
Blue Lake Community (Grant Co. FD #7)	Residential	120	$190,000.00	100%	$22,800,000
City of Soap Lake	Mixed Use	800	$74,500.00	100%	$59,600,000
Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	100%	$17,500,000
Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	100%	$32,300,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	100%	$34,200,000
Rim Rock Cove (Grant Co. FD #7)	Residential	85	$35,000.00	100%	$2,975,000
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	100%	$16,000,000

Hazard Loss of Gas Service

Neighborhood Name					
Blue Lake Community (Grant Co. FD #7)	Residential	120	$190,000.00	100%	$22,800,000
City of Soap Lake	Mixed Use	800	$74,500.00	100%	$59,600,000
Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	100%	$17,500,000
Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	50%	$16,150,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	50%	$17,100,000
Rim Rock Cove (Grant Co. FD	Residential	85	$35,000.00	100%	$2,975,000

#7)					
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	10%	$1,600,000

Hazard Loss of Sewer Service

Neighborhood Name					
Blue Lake Community (Grant Co. FD #7)	Residential	120	$190,000.00	5%	$1,140,000
City of Soap Lake	Mixed Use	800	$74,500.00	95%	$56,620,000
Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	5%	$875,000
Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	5%	$1,615,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	5%	$1,710,000
Rim Rock Cove (Grant Co. FD #7)	Residential	85	$35,000.00	100%	$2,975,000
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	5%	$800,000

Hazard Loss of Water Service

Neighborhood Name					
City of Soap Lake	Mixed Use	800	$74,500.00	100%	$59,600,000
Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	5%	$875,000
Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	100%	$32,300,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	100%	$34,200,000
Rim Rock Cove (Grant Co. FD #7)	Residential	85	$35,000.00	100%	$2,975,000
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	100%	$16,000,000

Hazard Major Fire - Urban

Neighborhood Name					
Blue Lake Community (Grant Co. FD #7)	Residential	120	$190,000.00	100%	$22,800,000
City of Soap Lake	Mixed Use	800	$74,500.00	100%	$59,600,000

Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	100%	$17,500,000
Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	100%	$32,300,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	100%	$34,200,000
Rim Rock Cove (Grant Co. FD #7)	Residential	85	$35,000.00	100%	$2,975,000
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	100%	$16,000,000

Hazard Major Fire -Wildland

Neighborhood Name					
Blue Lake Community (Grant Co. FD #7)	Residential	120	$190,000.00	100%	$22,800,000
City of Soap Lake	Mixed Use	800	$74,500.00	100%	$59,600,000
Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	100%	$17,500,000
Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	100%	$32,300,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	100%	$34,200,000
Rim Rock Cove (Grant Co. FD #7)	Residential	85	$35,000.00	100%	$2,975,000
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	100%	$16,000,000

Hazard Major Fire-Urban

Neighborhood Name					
Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	20%	$3,500,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	20%	$6,840,000
Rim Rock Cove (Grant Co. FD #7)	Residential	85	$35,000.00	50%	$1,487,500
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	20%	$3,200,000

Hazard Radiological

Neighborhood Name

Blue Lake Community (Grant Co. FD #7)	Residential	120	$190,000.00	100%	$22,800,000
City of Soap Lake	Mixed Use	800	$74,500.00	100%	$59,600,000
Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	100%	$17,500,000
Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	100%	$32,300,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	100%	$34,200,000
Rim Rock Cove (Grant Co. FD #7)	Residential	85	$35,000.00	100%	$2,975,000
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	100%	$16,000,000

Hazard Severe Winter Storm

Neighborhood Name					
Blue Lake Community (Grant Co. FD #7)	Residential	120	$190,000.00	100%	$22,800,000
City of Soap Lake	Mixed Use	800	$74,500.00	100%	$59,600,000
Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	100%	$17,500,000
Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	100%	$32,300,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	100%	$34,200,000
Rim Rock Cove (Grant Co. FD #7)	Residential	85	$35,000.00	100%	$2,975,000
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	100%	$16,000,000

Hazard Special Hazards

Neighborhood Name					
Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	10%	$1,750,000
Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	10%	$3,230,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	10%	$3,420,000
Rim Rock Cove (Grant Co. FD	Residential	85	$35,000.00	100%	$2,975,000

#7)					
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	15%	$2,400,000

Hazard Telecommunications

Neighborhood Name					
Blue Lake Community (Grant Co. FD #7)	Residential	120	$190,000.00	90%	$20,520,000
City of Soap Lake	Mixed Use	800	$74,500.00	100%	$59,600,000
Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	100%	$17,500,000
Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	50%	$16,150,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	10%	$3,420,000
Rim Rock Cove (Grant Co. FD #7)	Residential	85	$35,000.00	100%	$2,975,000
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	100%	$16,000,000

Hazard Transportation

Neighborhood Name					
Blue Lake Community (Grant Co. FD #7)	Residential	120	$190,000.00	100%	$22,800,000
City of Soap Lake	Mixed Use	800	$74,500.00	100%	$59,600,000
Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	100%	$17,500,000
Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	100%	$32,300,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	100%	$34,200,000
Rim Rock Cove (Grant Co. FD #7)	Residential	85	$35,000.00	100%	$2,975,000
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	10%	$1,600,000

Hazard Volcano Activity

Neighborhood Name					
Blue Lake Community (Grant Co. FD #7)	Residential	120	$190,000.00	100%	$22,800,000

City of Soap Lake	Mixed Use	800	$74,500.00	100%	$59,600,000
Grant Orchards (Grant Co. FD #7)	Mixed Use	175	$100,000.00	100%	$17,500,000
Lakeview Country Club(FD District 7)	Residential	170	$190,000.00	100%	$32,300,000
Lakeview Park9Grant Co. FD #7)	Residential	380	$90,000.00	100%	$34,200,000
Rim Rock Cove (Grant Co. FD #7)	Residential	85	$35,000.00	100%	$2,975,000
Westmount Acres (Grant Co. FD #7)	Residential	160	$100,000.00	100%	$16,000,000

For future growth trends see **"Appendix A"** *Grant County Rural Land Use Analysis: Population, Housing and UGA Land Allocations* (Proulx Cearns, Inc., September 1999)

Ephrata School District #165

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of the Ephrata Schools District, hazard events such as severe winter storms, high winds, utility shortage, transportation accidents, hazardous materials and lightning have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
ESD-MH1	Structure Retrofit	Backup Power Generator	1 of 1	$500,000

Governmental Entity:	Ephrata School District #165
Hazard Type:	Multi-hazard
Initiative Category:	Structural
Priority:	1 of 1

Initiative Nr: ESD-MH1
Backup Power Generator for Ephrata Middle School

Rationale:
A backup power generator would allow the Ephrata Middle School to be used as an emergency shelter in a short or long-term incident. Having backup power would allow the school to keep children at their facilities. During hazard events, or other disasters, that would cause the electrical power to fail, the Middle School could provide a place for area residents to go that would have lighting, heat, and other necessary facilities necessary to shelter them for extended periods of time.

Relates to Plan Goal(s):	9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.

Implementer:	Facilities Manager
Estimated Cost:	$500,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	4.23: 1

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of the Soap Lake District, hazard events such as severe winter storms, high winds and lightning have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
SLSD-MH1	Structure Retrofit	Backup Power Generator	1 of 1	$50,000

Governmental Entity:	Soap Lake School District #156
Hazard Type:	Multi-hazard
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: SLSD-MH1
Backup Power Generator for Soap Lake High and Middle School

Rationale:
A backup power generator would allow the Soap Lake High and Middle School to be used as an emergency shelter in a short or long-term incident. Having backup power would allow the school to keep children at their facilities. During hazard events, or other disasters, that would cause the electrical power to fail, the Soap Lake High and Middle School could provide a place for area residents to go that would have lighting, heat, and other necessary facilities necessary to shelter them for extended periods of time.

Relates to Plan Goal(s):	9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	Facilities Manager

Estimated Cost:	$50,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	11.43: 1

City of Ephrata

Prioritization of Hazards

After a review of the hazards threatening the facilities of the City of Ephrata has selected severe storms, hazardous materials, transportation, special hazards, and utility shortage as the hazards of concern.

Mitigation Strategies

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Category	Initiative Description	Priority	Estimated Cost
E-MH1	Critical Facility Replacement/Retrofit	Back-up generators, perimeter fencing to wells, telemetry Upgrades and General Security Improvements to the City water supply.	1 of 2	$250,000
E-MH1	Relocate Critical City Government Facilities	Due to the potential hazards it is desired to move the City Hall, Police Station, City Shop and Fire Station to a centralized location outside of the flood plain and away from the railroad tracks and hazardous industrial sites.	2 of 2	$3,000,000

Mitigation Initiatives

Governmental Entity:	City of Ephrata
Hazard Type:	Multi Hazard
Initiative Category:	Critical Facility Replacement/Retrofit
Priority:	1 of 2

Initiative Nr: E-MH1

The initiative would provide Back-up generators for wells, perimeter fencing, and telemetry Upgrades and General Security Improvements to the City water supply.

Rationale:

This proposal would help protect the city's water system during from a variety of hazards.

Relates to Plan Goal(s):	2. Reduce property damage 9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	2B. Design and retrofit essential water and sewer services to minimize the potential for disruption during a disaster. 9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	City of Ephrata Public Works
Estimated Cost:	$250,000
Time Period:	2005-2006
Funding Source:	Operating budget and/or grant funding
Implementation Status:	New
Final Cost to Benefit Ratio:	2.86 : 1

Governmental Entity:	City of Ephrata
Hazard Type:	Multi-hazards
Initiative Category:	Relocate Critical City Government Facilities
Priority:	2 of 2

Initiative Nr: M-SSH1

Due to the potential hazards it is desired to move the City Hall, Police Station, City Shop and Fire Station to a centralized location outside of the flood plain and away from the railroad tracks and hazardous industrial sites.

Rationale:

The current city leadership, critical support, and emergency responders have facilities located in an area vulnerable to both natural and technological hazards.

Relates to Plan Goal(s):	9. Maintain essential services, facilities, and infrastructures.

Relates to Plan Objective(s):	A. Ensure that local emergency services have the capability to detect emergency situations and promptly initiate emergency response options. B Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed. C. Ensure that utility and communications systems supporting emergency services operations can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	City of Ephrata, City Manager
Estimated Cost:	$3,000,000
Time Period:	2005-2009
Funding Source:	Operating budget
Implementation Status:	New
Final Cost to Benefit Ratio:	42 : 1

City of Soap Lake

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of City of Soap Lake, hazard events such as severe winter storms, high winds, utility shortage or failure and lightning have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
SL-MH1	Structure Retrofit	Backup Power Generator	1 of 1	$500,000

Governmental Entity:	City of Soap Lake
Hazard Type:	Multi-hazard
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: SL-MH1

Backup power generator, fuel system, and other supplemental equipment/retrofit for Sewer Lift Station #2.

Rationale:
A power outage caused by high winds, a winter storm, lightning or other natural hazard might disrupt the power supply to Sewer Lift Station #2, which currently does not have a backup power supply, to stop functioning. This would significantly impact the community and should the problem be prolonged might cause environmental damage to this lakefront community.

Relates to Plan Goal(s):	2. Reduce property damage 9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	2B. Design and retrofit essential water and sewer services to minimize the potential for disruption during

	a disaster. 9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	City Council
Estimated Cost:	$500,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	2.14: 1

Grant County Fire Protection District #7

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of FPD #7, hazard events such as severe winter storms, high winds, utility shortage and lightning have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
FPD7-MH1 2-2	Structure Retrofit	Backup Power Generator	1 of 1	$50,000

Governmental Entity:	Grant County Fire Protection District #7
Hazard Type:	Multi-Hazard
Initiative Category:	Structural
Priority:	2 of 2

Initiative Nr: FPD7-MH1

Procure, install, propane-powered emergency electrical generator for the fire station at 155 Hwy. 28W, Soap Lake.

Rationale:

A power outage caused by high winds, a winter storm, lightning or other natural hazard may cause the freezing of truck pumps/tank causing as much as $400,000 in loss of equipment and the inability to respond to an emergent event.

Relates to Plan Goal(s):	9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	Fire Chief

Estimated Cost:	$50,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	18.52: 1

Port of Ephrata

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of the Port of Ephrata, high winds have been selected as the hazard of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
PE-HW1	Structure Retrofit	Buildings #2004 and #801 structurally are subject to damage from high winds. This initiative is designed to mitigate future wind damage.	1 of 1	$99,000

Governmental Entity:	Port of Ephrata
Hazard Type:	High Winds
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: PE-HW1
Port of Ephrata Buildings #2004 and #801 structurally are subject to damage from high winds. This initiative is designed to mitigate future wind damage. The cost is to re-roof the buildings and add Simpson ties plus any yearly maintenance cost for the life of the roofs.

Rationale:
Buildings could sustain damage or possibly collapse if not structurally hardened.

Relates to Plan Goal(s):	2. Reduce property damage 9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	2B. Design and retrofit essential transportation facilities and systems to minimize the potential for disruption during a disaster. 9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.

Implementer:	Port of Ephrata
Estimated Cost:	$99,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	11.58 : 1

Moses Lake-Warden Region

Municipal Area	Participating Jurisdiction
Moses Lake	City of Moses Lake
	Moses Lake School District #161
	Port of Moses Lake
Warden	City of Warden
	Port of Warden

Grant County consists of over sixty taxing districts, including municipalities, port districts, fire districts, and others with leadership in most cases that is part time or volunteer. These diverse entities, with overlapping jurisdictions, often work regionally to address challenges including those caused by natural and manmade hazards. This regional approach was used to identify their own particular hazards and to assess their regional vulnerability to them. The below Hazard Identification and Vulnerability matrix was developed by the Hazard Mitigation Task Force members from the Moses Lake-Warden Region.

The purpose of this section of the plan is to assess the vulnerability of the Moses Lake-Warden Region participants of Grant County in regards to the various hazards previously identified in Chapter 2 of this plan. In addition, mitigation strategies that are currently in place relating to these hazards as well as newly proposed mitigation strategies have been included in this section of the plan. To complete the vulnerability assessment process, various county staff utilized a series of forms available in the 20/20 Mitigation Software. The information collected with these forms is included in this portion of the plan.

As part of the vulnerability assessment process, officials completed an inventory of all critical facilities and have considered these critical facilities in their planning and mitigation strategy development process. *At this point, the planning process has identified over 200 critical facilities in Grant County.* However, due to post 9/11 concerns, those facilities are not listed in this document. In addition, further action will be taken to document these facilities with both photographs and Global Positioning System (GPS) coordinates in a Geographical Information Services (GIS) mapping. A list of these facilities will be made available to FEMA personnel in the event this information is required to obtain future hazard mitigation grant funding.

Representatives from local government worked closely with other agencies and Grant County Emergency Management staff to develop a comprehensive, coordinated mitigation plan intended to reduce the vulnerability to hazards within the Moses Lake-Warden Region of Grant County. This document presents the results of this effort to identify the specific hazards threatening the Moses Lake-Warden Region and to identify current as well as proposed mitigation strategies, projects and/or programs to address identified vulnerabilities.

The assessment is based on the best currently available information and data regarding the characteristics of the neighborhoods identified, the hazards that threaten the people, property, and environment of these neighborhoods as well as the impacts these neighborhoods have suffered in past disasters. This information includes, when available, United States Census data, local tax records, local and national geographic information system data, Flood Insurance Rate Maps, hazard specific analyses, and other environmental and demographic facts.

However, very often authoritative or current information simply was not available for the planning effort. In these cases, the experience, knowledge and judgment of local officials were used in the planning, including assumptions and approximations that were believed to be reasonable. In addition, straight-forward, simplified technical analyses were used for tasks such as estimating property values, determining the size of populations affected, and so forth. The reliance on the judgment of knowledgeable officials and simplified analyses is considered acceptable at this stage to allow the participating organizations to complete the tasks needed to develop this multi-jurisdictional hazard mitigation plan. As the planning continues in future years, or at the time when a proposed mitigation initiative is intended to be funded and/or implemented, the participating organizations/jurisdictions recognize that additional information and analyses may be required. Local government is committed to the implementation of the mitigation-related projects/programs described in this section of the plan when and if resources become available. Local government is also committed to continuing the mitigation planning process that has resulted in the development of this document, and to the ongoing cooperation with other agencies, organizations, and jurisdictions to make Grant County more resistant to the damages and hardships that could otherwise be the result of future disasters.

Moses Lake-Warden Region Overview

City of Moses Lake

Contact Information:
Ron Covey, Mayor
P.O. Box 1579
Moses Lake, WA 98837
Telephone: (509) 766-9201
Population of Jurisdiction: 16,110 and growing slightly
Principal Economic Base: Industrial and Manufacturing
Economic Characteristic: Economically disadvantaged

Jurisdiction-Specific Vulnerability Assessment & Mitigation Strategies
Current Hazard Mitigation Codes/Plans/Ordinances:

- Comprehensive Land Use Plan
- Adopted Land Use/Zoning Code
- Adopted Building Code (International Building Code)
- Zoning Code
- Adopted fire or other life safety code
- Been surveyed by the Washington Surveying & Rating Bureau WSRB Fire Rating 5
  WSRB Building Code Effectiveness Rating 3

- Participant in the National Flood Insurance Program (NFIP)

City of Moses Lake Current Land Uses and Potential for New Development

Current Land Use Category	Percent of Jurisdiction
Agricultural	13.7 %
Commercial	9.5 %
Industrial	15.8 %
Institutional (education, health care, etc.)/Parks/restricted wild land ref.	13.1 %
Residential	17 %
Vacant/unused-private ownership	30.5 %
Transportation or utility right-of-way	18 %

Future Land Use Categories	Planning year for future land use projection: 2015
Commercial	17.7 %
Industrial	29.7 %
Institutional	9.2 %
Parks/restricted wild land refuge	4.4 %
Residential	34.8 %

30 % of the City of Moses Lake is still open to development. Development of vacant/unused land is occurring rapidly or somewhat faster than planned (3%/year), development or construction of existing properties is occurring to some property in a few locations.

City of Warden

Contact Information:
Roldan Capetillo, Mayor
201 Ash St.
Warden, WA 98857
Telephone: (509) 349-2033
Population of Jurisdiction: 2,540 and growing slightly
Principal Economic Base: Agricultural
Economic Characteristic: Economically disadvantaged

Jurisdiction-Specific Vulnerability Assessment & Mitigation Strategies
Current Hazard Mitigation Codes/Plans/Ordinances:

- Comprehensive Land Use Plan
- Adopted Land Use/Zoning Code
- Adopted Building Code (WA State Building Code and IBC Appendixes)
- Adopted fire and other life safety code

City of Warden Current Land Uses and Potential for New Development

Current Land Use Category	Percent of Jurisdiction
Developed with mixed uses	1 %
Industrial	31 %
Parks/restricted wild land/wildland refuge	1 %
Residential	54 %
Vacant/unused-government ownership	3 %

39% of the Warden is still open to development. Little or no development is occurring and expansion, development or construction of existing properties is occurring to some property in a few locations.

Comparison of Jurisdictional Relative Risk: Moses Lake-Warden Region

Hazard	Probability of Occurrence	Impacted Area	Health & Safety Impacts	Property Impacts	Environmental Impacts	Economic Impacts	Total Hazard Rating
Natural	Total Natural Hazard Risk Rating: **280**						
Drought	4	4	1	2	1	2	**40**
Earthquake	3	1	1	1	0	0	**9**
Flooding	2	1	0	1	0	1	**6**
Hail	1	2	1	1	0	1	**5**
High Winds	5	4	2	2	2	2	**60**
Infestation, Disease	1	3	2	0	0	1	**6**
Lightning	5	4	1	1	0	1	**35**
Major Fire – Wildland	5	3	1	1	0	1	**30**
Severe Winter Storm	5	4	2	2	1	1	**50**
Volcano Activity	3	4	2	2	2	3	**39**
Technological	Total Technological Hazard Risk Rating: **133**						
Civil Disturbance	1	3	2	1	1	2	**9**
Communications	1	3	1	1	0	2	**7**
Hazardous Materials	1	1	1	1	1	1	**5**
Loss of Electrical	3	3	1	0	0	3	**21**
Loss of Gas /	1	3	0	0	0	2	**5**

Hazard	Probability of Occurrence	Impacted Area	Health & Safety Impacts	Property Impacts	Environmental Impacts	Economic Impacts	Total Hazard Rating
Fuel							
Loss of Sewer	1	3	1	1	1	3	**9**
Loss of Water	1	3	1	1	1	3	**9**
Major Fire – Urban	1	2	2	2	2	2	**10**
Radiological	2	3	2	1	2	2	**20**
Special Hazards	2	3	1	1	1	1	**14**
Transportation	**3**	**3**	**1**	**1**	**1**	**2**	**24**
	Total Relative Risk: **413**						

Note: See table below for explanation of ratings.

Impact Area	*Probability of Occurrence*	*Health & Safety Impacts*
0 No developed area impacted	1 Unknown but rare occurrence	0 No Health and Safety impact
1 Less that 25% of developed areas impacted	2 Unknown but anticipate an occurrence	1 Few injuries/illnesses
2 Less than 50% of developed area impacted	3 100 years or less occurrence	2 Few fatalities but many injuries/illnesses
3 Less than 75% of developed area impacted	4 25 years or less occurrence	3 Numerous fatalities
4 Over 75% of developed area impacted	5 Once a year or more occurrence	

Property Impacts	*Environmental Impacts*	*Economic Impacts*
0 No property damage	0 Little or no environmental damage	0 No economic impact
1 Few properties destroyed - few properties damaged	1 Resources damaged with short term recovery practical	1 Low direct and/or low indirect costs
2 Few destroyed - many damaged	2 Resources damaged with long term recovery feasible	2 High direct & low indirect costs
2 Few damaged - many destroyed	3 Resources destroyed beyond recovery	2 Low direct & high indirect costs
3 Many properties destroyed and damaged		3 High direct && high indirect costs

Property at Risk

To make jurisdiction-wide analysis of the dollar value of properties at risk for each hazard type feasible and practical for mitigation planning purposes, a simplified approach has been used. The estimate of the dollar value of properties at risk for specific hazards is accomplished in the

following manner: The number of structures in a specific neighborhood and the average dollar value for those structures is estimated by local planners, based on readily available data or their best judgment in the absence of suitable data.
(Note: In many cases the median value was used from recent census data when the average value was not readily available. This average value of the residences in a neighborhood somewhat undervalues the property at risk.) The percentage of the specific neighborhood threatened by the identified hazard is then estimated by local planners, again based on readily available data or their best judgment. The percent of the neighborhood at risk is then used as a multiplier to determine the estimated number of structures at risk from that hazard. This number is then multiplied by the estimated average cost of the structures to derive an estimated total value of the property at risk of damage in that neighborhood from the identified hazard. The methodology is simplistic but conservative in that it assumes structures are uniformly distributed throughout the neighborhood in relation to the area of risk that the hazard threatens the entire value of each structure, and that structures are equally vulnerable to the impacts of the hazard. The derived estimates for the dollar value of property at risk may therefore be higher than would actually be the case, but the estimates are considered satisfactory to support the local mitigation planning process.

People at Risk

The estimated total populations for each neighborhood by jurisdiction are given in the table below which are determined by local planners through readily available data or their best judgment in the absence of suitable data. If a person wanted to determine the percentage of the population at risk in a particular neighborhood, the following method should be used: multiply the percent of structures at risk by the total estimated neighborhood population. The methodology is simplistic but conservative in that it assumes occupied structures are uniformly distributed throughout the neighborhood in relation to the area of risk, that the population is present on a 24 hour, 7 day basis, and that all individuals are equally vulnerable to the impacts of the hazard event. Therefore, an estimation of the percentage of a population at risk may be higher than is actually the case, but is considered satisfactory to support the local mitigation planning process.

Grant County
Mitigation 20/20 Task ™
Estimated Value of Structures at Risk, by

	Use	Estimated Number Of Structures	Average Value of Each Structure	Percent of Structures at Risk	Total Estimated Value ($) of Structures at Risk
Moses Lake					
Hazard Civil Disturbance					
Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	50%	$7,500,000
Northwest Segment/Knolls Vista/BasinHomes/Longview	Mixed Use	800	$150,000.00	5%	$6,000,000
Port of Moses Lake	Industrial	150	$500,000.00	10%	$7,500,000
Southeast Segment/Lakeview Terr/Garden Hgt./Mlake	Residential	2010	$200,000.00	5%	$20,100,000
Western Segment-Penisula,Guffin-Ecles,Sunset	Residential	1500	$100,000.00	5%	$7,500,000
Hazard Drought					
Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	100%	$15,000,000
Northwest Segment/Knolls Vista/BasinHomes/Longview	Mixed Use	800	$150,000.00	100%	$120,000,000
Port of Moses Lake	Industrial	150	$500,000.00	100%	$75,000,000
Southeast Segment/Lakeview Terr/Garden Hgt./Mlake	Residential	2010	$200,000.00	100%	$402,000,000
Western Segment-Penisula,Guffin-Ecles,Sunset	Residential	1500	$100,000.00	100%	$150,000,000
Westlake	Residential	300	$300,000.00	100%	$90,000,000
Wheeler Road Industrial Area	Industrial	30	$1,000,000.00	100%	$30,000,000
Hazard Earthquake					
Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	10%	$1,500,000

Northwest Segment/Knolls Vista/BasinHomes/Longview	Mixed Use	800	$150,000.00	50%	$60,000,000
Western Segment-Penisula,Guffin-Ecles,Sunset	Residential	1500	$100,000.00	30%	$45,000,000
Westlake	Residential	300	$300,000.00	30%	$27,000,000

Hazard Flooding

Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	25%	$3,750,000
Northwest Segment/Knolls Vista/BasinHomes/Longview	Mixed Use	800	$150,000.00	20%	$24,000,000
Western Segment-Penisula,Guffin-Ecles,Sunset	Residential	1500	$100,000.00	20%	$30,000,000
Westlake	Residential	300	$300,000.00	15%	$13,500,000
Wheeler Road Industrial Area	Industrial	30	$1,000,000.00	10%	$3,000,000

Hazard Hail

Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	100%	$15,000,000
Northwest Segment/Knolls Vista/BasinHomes/Longview	Mixed Use	800	$150,000.00	100%	$120,000,000
Western Segment-Penisula,Guffin-Ecles,Sunset	Residential	1500	$100,000.00	100%	$150,000,000
Westlake	Residential	300	$300,000.00	100%	$90,000,000
Wheeler Road Industrial Area	Industrial	30	$1,000,000.00	100%	$30,000,000

Hazard Hazardous Materials

Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	100%	$15,000,000
Northwest Segment/Knolls Vista/BasinHomes/Longview	Mixed Use	800	$150,000.00	15%	$18,000,000
Port of Moses Lake	Industrial	150	$500,000.00	25%	$18,750,000
Southeast Segment/Lakeview Terr/Garden Hgt./Mlake	Residential	2010	$200,000.00	5%	$20,100,000
Western Segment-Penisula,Guffin-Ecles,Sunset	Residential	1500	$100,000.00	75%	$112,500,000
Westlake	Residential	300	$300,000.00	25%	$22,500,000
Wheeler Road Industrial Area	Industrial	30	$1,000,000.00	75%	$22,500,000

Hazard High Winds

Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	100%	$15,000,000
Northwest Segment/Knolls Vista/BasinHomes/Longview	Mixed Use	800	$150,000.00	100%	$120,000,000
Port of Moses Lake	Industrial	150	$500,000.00	100%	$75,000,000
Southeast Segment/Lakeview Terr/Garden Hgt./Mlake	Residential	2010	$200,000.00	100%	$402,000,000
Western Segment-Penisula,Guffin-Ecles,Sunset	Residential	1500	$100,000.00	100%	$150,000,000
Westlake	Residential	300	$300,000.00	100%	$90,000,000
Wheeler Road Industrial Area	Industrial	30	$1,000,000.00	100%	$30,000,000

Hazard Infestation, Disease

Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	100%	$15,000,000
Northwest Segment/Knolls Vista/BasinHomes/Longview	Mixed Use	800	$150,000.00	100%	$120,000,000
Southeast Segment/Lakeview Terr/Garden Hgt./Mlake	Residential	2010	$200,000.00	100%	$402,000,000
Western Segment-Penisula,Guffin-Ecles,Sunset	Residential	1500	$100,000.00	100%	$150,000,000
Westlake	Residential	300	$300,000.00	100%	$90,000,000
Wheeler Road Industrial Area	Industrial	30	$1,000,000.00	100%	$30,000,000

Hazard Lightning

Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	100%	$15,000,000
Northwest Segment/Knolls Vista/BasinHomes/Longview	Mixed Use	800	$150,000.00	100%	$120,000,000
Port of Moses Lake	Industrial	150	$500,000.00	100%	$75,000,000
Southeast Segment/Lakeview Terr/Garden Hgt./Mlake	Residential	2010	$200,000.00	100%	$402,000,000
Western Segment-Penisula,Guffin-Ecles,Sunset	Residential	1500	$100,000.00	100%	$150,000,000
Westlake	Residential	300	$300,000.00	100%	$90,000,000
Wheeler Road Industrial Area	Industrial	30	$1,000,000.00	100%	$30,000,000

Hazard Loss of Electrical Service

Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	100%	$15,000,000

Northwest Segment/Knolls Vista/BasinHomes/Longview	Mixed Use	800	$150,000.00	100%	$120,000,000
Port of Moses Lake	Industrial	150	$500,000.00	50%	$37,500,000
Southeast Segment/Lakeview Terr/Garden Hgt./Mlake	Residential	2010	$200,000.00	100%	$402,000,000
Western Segment-Penisula,Guffin-Ecles,Sunset	Residential	1500	$100,000.00	100%	$150,000,000
Westlake	Residential	300	$300,000.00	100%	$90,000,000
Wheeler Road Industrial Area	Industrial	30	$1,000,000.00	75%	$22,500,000

Hazard Loss of Gas Service

Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	100%	$15,000,000
Northwest Segment/Knolls Vista/BasinHomes/Longview	Mixed Use	800	$150,000.00	50%	$60,000,000
Port of Moses Lake	Industrial	150	$500,000.00	100%	$75,000,000
Southeast Segment/Lakeview Terr/Garden Hgt./Mlake	Residential	2010	$200,000.00	50%	$201,000,000
Western Segment-Penisula,Guffin-Ecles,Sunset	Residential	1500	$100,000.00	75%	$112,500,000
Westlake	Residential	300	$300,000.00	75%	$67,500,000
Wheeler Road Industrial Area	Industrial	30	$1,000,000.00	75%	$22,500,000

Hazard Loss of Sewer Service

Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	75%	$11,250,000
Northwest Segment/Knolls Vista/BasinHomes/Longview	Mixed Use	800	$150,000.00	75%	$90,000,000
Port of Moses Lake	Industrial	150	$500,000.00	100%	$75,000,000
Southeast Segment/Lakeview Terr/Garden Hgt./Mlake	Residential	2010	$200,000.00	75%	$301,500,000
Western Segment-Penisula,Guffin-Ecles,Sunset	Residential	1500	$100,000.00	75%	$112,500,000
Westlake	Residential	300	$300,000.00	75%	$67,500,000
Wheeler Road Industrial Area	Industrial	30	$1,000,000.00	75%	$22,500,000

Hazard Loss of Water Service

Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	75%	$11,250,000
Northwest Segment/Knolls	Mixed Use	800	$150,000.00	75%	$90,000,000

Vista/BasinHomes/Longview					
Port of Moses Lake	Industrial	150	$500,000.00	100%	$75,000,000
Southeast Segment/Lakeview Terr/Garden Hgt./Mlake	Residential	2010	$200,000.00	75%	$301,500,000
Western Segment-Penisula,Guffin-Ecles,Sunset	Residential	1500	$100,000.00	75%	$112,500,000
Westlake	Residential	300	$300,000.00	75%	$67,500,000
Wheeler Road Industrial Area	Industrial	30	$1,000,000.00	75%	$22,500,000

Hazard Major Fire -Wildland

Neighborhood Name					
Southeast Segment/Lakeview Terr/Garden Hgt./Mlake	Residential	2010	$200,000.00	25%	$100,500,000
Western Segment-Penisula,Guffin-Ecles,Sunset	Residential	1500	$100,000.00	10%	$15,000,000
Westlake	Residential	300	$300,000.00	10%	$9,000,000
Wheeler Road Industrial Area	Industrial	30	$1,000,000.00	25%	$7,500,000

Hazard Major Fire-Urban

Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	25%	$3,750,000
Northwest Segment/Knolls Vista/BasinHomes/Longview	Mixed Use	800	$150,000.00	15%	$18,000,000
Port of Moses Lake	Industrial	150	$500,000.00	50%	$37,500,000
Southeast Segment/Lakeview Terr/Garden Hgt./Mlake	Residential	2010	$200,000.00	30%	$120,600,000
Western Segment-Penisula,Guffin-Ecles,Sunset	Residential	1500	$100,000.00	50%	$75,000,000
Westlake	Residential	300	$300,000.00	20%	$18,000,000
Wheeler Road Industrial Area	Industrial	30	$1,000,000.00	10%	$3,000,000

Hazard Radiological

Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	25%	$3,750,000
Northwest Segment/Knolls Vista/BasinHomes/Longview	Mixed Use	800	$150,000.00	5%	$6,000,000
Port of Moses Lake	Industrial	150	$500,000.00	50%	$37,500,000
Southeast Segment/Lakeview Terr/Garden Hgt./Mlake	Residential	2010	$200,000.00	5%	$20,100,000
Western Segment-	Residential	1500	$100,000.00	5%	$7,500,000

Penisula,Guffin-Ecles,Sunset					
Westlake	Residential	300	$300,000.00	5%	$4,500,000
Wheeler Road Industrial Area	Industrial	30	$1,000,000.00	5%	$1,500,000

Hazard Severe Winter Storm

Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	100%	$15,000,000
Northwest Segment/Knolls Vista/BasinHomes/Longview	Mixed Use	800	$150,000.00	100%	$120,000,000
Port of Moses Lake	Industrial	150	$500,000.00	100%	$75,000,000
Southeast Segment/Lakeview Terr/Garden Hgt./Mlake	Residential	2010	$200,000.00	100%	$402,000,000
Western Segment-Penisula,Guffin-Ecles,Sunset	Residential	1500	$100,000.00	100%	$150,000,000
Westlake	Residential	300	$300,000.00	100%	$90,000,000
Wheeler Road Industrial Area	Industrial	30	$1,000,000.00	100%	$30,000,000

Hazard Special Hazards

Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	10%	$1,500,000
Port of Moses Lake	Industrial	150	$500,000.00	100%	$75,000,000
Western Segment-Penisula,Guffin-Ecles,Sunset	Residential	1500	$100,000.00	75%	$112,500,000
Westlake	Residential	300	$300,000.00	30%	$27,000,000
Wheeler Road Industrial Area	Industrial	30	$1,000,000.00	75%	$22,500,000

Hazard Telecommunications

Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	50%	$7,500,000
Northwest Segment/Knolls Vista/BasinHomes/Longview	Mixed Use	800	$150,000.00	50%	$60,000,000
Southeast Segment/Lakeview Terr/Garden Hgt./Mlake	Residential	2010	$200,000.00	50%	$201,000,000
Western Segment-Penisula,Guffin-Ecles,Sunset	Residential	1500	$100,000.00	75%	$112,500,000
Westlake	Residential	300	$300,000.00	75%	$67,500,000
Wheeler Road Industrial Area	Industrial	30	$1,000,000.00	75%	$22,500,000

Hazard Transportation

Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	15%	$2,250,000

Northwest Segment/Knolls Vista/BasinHomes/Longview	Mixed Use	800	$150,000.00	15%	$18,000,000
Southeast Segment/Lakeview Terr/Garden Hgt./Mlake	Residential	2010	$200,000.00	25%	$100,500,000
Western Segment-Penisula,Guffin-Ecles,Sunset	Residential	1500	$100,000.00	35%	$52,500,000
Westlake	Residential	300	$300,000.00	15%	$13,500,000
Wheeler Road Industrial Area	Industrial	30	$1,000,000.00	10%	$3,000,000

Hazard Volcano Activity

Neighborhood Name					
Central Business District	Commercial/Retail	50	$300,000.00	100%	$15,000,000
Northwest Segment/Knolls Vista/BasinHomes/Longview	Mixed Use	800	$150,000.00	100%	$120,000,000
Port of Moses Lake	Industrial	150	$500,000.00	100%	$75,000,000
Southeast Segment/Lakeview Terr/Garden Hgt./Mlake	Residential	2010	$200,000.00	100%	$402,000,000
Westlake	Residential	300	$300,000.00	100%	$90,000,000
Wheeler Road Industrial Area	Industrial	30	$1,000,000.00	100%	$30,000,000

Warden

Hazard Civil Disturbance

Neighborhood Name	Use	Estimated Number Of Structures	Average Value of Each Structure	Percent of Structures at Risk	Total Estimated Value ($) of Structures at Risk
Country Estates	Residential	35	$70,000.00	100%	$2,450,000
Grand Coulee	Residential	187	$70,000.00	100%	$13,090,000
Industrial Zone	Industrial	60	$1,750,000.00	100%	$105,000,000
Jeske	Residential	84	$80,000.00	100%	$6,720,000
Warden Heights	Residential	140	$85,000.00	100%	$11,900,000
Warden Original	Mixed Use	232	$180,000.00	100%	$41,760,000

Hazard Drought

Neighborhood Name					
Country Estates	Residential	35	$70,000.00	100%	$2,450,000
Grand Coulee	Residential	187	$70,000.00	100%	$13,090,000

Industrial Zone	Industrial	60	$1,750,000.00	100%	$105,000,000
Jeske	Residential	84	$80,000.00	100%	$6,720,000
Warden Heights	Residential	140	$85,000.00	100%	$11,900,000
Warden Original	Mixed Use	232	$180,000.00	100%	$41,760,000

Hazard Earthquake

Neighborhood Name

Country Estates	Residential	35	$70,000.00	100%	$2,450,000
Grand Coulee	Residential	187	$70,000.00	100%	$13,090,000
Industrial Zone	Industrial	60	$1,750,000.00	100%	$105,000,000
Warden Heights	Residential	140	$85,000.00	100%	$11,900,000
Warden Original	Mixed Use	232	$180,000.00	100%	$41,760,000

Hazard Flooding

Neighborhood Name

Country Estates	Residential	35	$70,000.00	100%	$2,450,000
Grand Coulee	Residential	187	$70,000.00	100%	$13,090,000
Industrial Zone	Industrial	60	$1,750,000.00	100%	$105,000,000
Warden Heights	Residential	140	$85,000.00	100%	$11,900,000
Warden Original	Mixed Use	232	$180,000.00	100%	$41,760,000

Hazard Hail

Neighborhood Name

Country Estates	Residential	35	$70,000.00	100%	$2,450,000
Grand Coulee	Residential	187	$70,000.00	100%	$13,090,000
Industrial Zone	Industrial	60	$1,750,000.00	100%	$105,000,000
Warden Heights	Residential	140	$85,000.00	100%	$11,900,000
Warden Original	Mixed Use	232	$180,000.00	100%	$41,760,000

Hazard Hazardous Materials

Neighborhood Name

Industrial Zone	Industrial	60	$1,750,000.00	100%	$105,000,000
Warden Heights	Residential	140	$85,000.00	20%	$2,380,000

Hazard High Winds

Neighborhood Name

Country Estates	Residential	35	$70,000.00	100%	$2,450,000
Grand Coulee	Residential	187	$70,000.00	100%	$13,090,000
Industrial Zone	Industrial	60	$1,750,000.00	100%	$105,000,000
Jeske	Residential	84	$80,000.00	100%	$6,720,000
Warden Heights	Residential	140	$85,000.00	100%	$11,900,000
Warden Original	Mixed Use	232	$180,000.00	100%	$41,760,000

Hazard Infestation, Disease

Neighborhood Name					
Country Estates	Residential	35	$70,000.00	100%	$2,450,000
Grand Coulee	Residential	187	$70,000.00	100%	$13,090,000
Warden Heights	Residential	140	$85,000.00	100%	$11,900,000

Hazard Lightning

Neighborhood Name					
Country Estates	Residential	35	$70,000.00	100%	$2,450,000
Grand Coulee	Residential	187	$70,000.00	100%	$13,090,000
Jeske	Residential	84	$80,000.00	100%	$6,720,000
Warden Heights	Residential	140	$85,000.00	100%	$11,900,000
Warden Original	Mixed Use	232	$180,000.00	100%	$41,760,000

Hazard Loss of Electrical Service

Neighborhood Name					
Country Estates	Residential	35	$70,000.00	100%	$2,450,000
Grand Coulee	Residential	187	$70,000.00	100%	$13,090,000
Industrial Zone	Industrial	60	$1,750,000.00	100%	$105,000,000
Jeske	Residential	84	$80,000.00	100%	$6,720,000
Warden Heights	Residential	140	$85,000.00	100%	$11,900,000
Warden Original	Mixed Use	232	$180,000.00	100%	$41,760,000

Hazard Loss of Gas Service

Neighborhood Name					
Country Estates	Residential	35	$70,000.00	20%	$490,000
Grand Coulee	Residential	187	$70,000.00	20%	$2,618,000
Industrial Zone	Industrial	60	$1,750,000.00	100%	$105,000,000
Jeske	Residential	84	$80,000.00	20%	$1,344,000
Warden Heights	Residential	140	$85,000.00	20%	$2,380,000
Warden Original	Mixed Use	232	$180,000.00	20%	$8,352,000

Hazard Loss of Sewer Service

Neighborhood Name					
Country Estates	Residential	35	$70,000.00	100%	$2,450,000
Grand Coulee	Residential	187	$70,000.00	100%	$13,090,000
Industrial Zone	Industrial	60	$1,750,000.00	100%	$105,000,000
Jeske	Residential	84	$80,000.00	100%	$6,720,000
Warden Heights	Residential	140	$85,000.00	100%	$11,900,000
Warden Original	Mixed Use	232	$180,000.00	100%	$41,760,000

Hazard Loss of Water Service

Neighborhood Name					
Country Estates	Residential	35	$70,000.00	100%	$2,450,000
Grand Coulee	Residential	187	$70,000.00	100%	$13,090,000
Industrial Zone	Industrial	60	$1,750,000.00	100%	$105,000,000
Jeske	Residential	84	$80,000.00	100%	$6,720,000
Warden Heights	Residential	140	$85,000.00	100%	$11,900,000
Warden Original	Mixed Use	232	$180,000.00	100%	$41,760,000

Hazard Major Fire -Wildland

Neighborhood Name					
Warden Original	Mixed Use	232	$180,000.00	100%	$41,760,000

Hazard Major Fire-Urban

Neighborhood Name					
Country Estates	Residential	35	$70,000.00	10%	$245,000
Grand Coulee	Residential	187	$70,000.00	10%	$1,309,000
Industrial Zone	Industrial	60	$1,750,000.00	50%	$52,500,000
Jeske	Residential	84	$80,000.00	10%	$672,000
Warden Heights	Residential	140	$85,000.00	20%	$2,380,000
Warden Original	Mixed Use	232	$180,000.00	10%	$4,176,000

Hazard Radiological

Neighborhood Name					
Country Estates	Residential	35	$70,000.00	100%	$2,450,000
Grand Coulee	Residential	187	$70,000.00	100%	$13,090,000
Industrial Zone	Industrial	60	$1,750,000.00	100%	$105,000,000
Jeske	Residential	84	$80,000.00	100%	$6,720,000
Warden Heights	Residential	140	$85,000.00	100%	$11,900,000
Warden Original	Mixed Use	232	$180,000.00	100%	$41,760,000

Hazard Severe Winter Storm

Neighborhood Name					
Country Estates	Residential	35	$70,000.00	100%	$2,450,000
Grand Coulee	Residential	187	$70,000.00	100%	$13,090,000
Industrial Zone	Industrial	60	$1,750,000.00	100%	$105,000,000
Jeske	Residential	84	$80,000.00	100%	$6,720,000
Warden Original	Mixed Use	232	$180,000.00	100%	$41,760,000

Hazard Special Hazards

Neighborhood Name

Industrial Zone	Industrial	60	$1,750,000.00	100%	$105,000,000

Hazard Telecommunications

Neighborhood Name					
Country Estates	Residential	35	$70,000.00	100%	$2,450,000
Grand Coulee	Residential	187	$70,000.00	100%	$13,090,000
Industrial Zone	Industrial	60	$1,750,000.00	100%	$105,000,000
Jeske	Residential	84	$80,000.00	100%	$6,720,000
Warden Heights	Residential	140	$85,000.00	100%	$11,900,000
Warden Original	Mixed Use	232	$180,000.00	100%	$41,760,000

Hazard Transportation

Neighborhood Name					
Grand Coulee	Residential	187	$70,000.00	10%	$1,309,000
Industrial Zone	Industrial	60	$1,750,000.00	50%	$52,500,000
Jeske	Residential	84	$80,000.00	10%	$672,000
Warden Heights	Residential	140	$85,000.00	20%	$2,380,000
Warden Original	Mixed Use	232	$180,000.00	40%	$16,704,000

Hazard Volcano Activity

Neighborhood Name					
Country Estates	Residential	35	$70,000.00	100%	$2,450,000
Grand Coulee	Residential	187	$70,000.00	100%	$13,090,000
Jeske	Residential	84	$80,000.00	100%	$6,720,000
Warden Heights	Residential	140	$85,000.00	100%	$11,900,000
Warden Original	Mixed Use	232	$180,000.00	100%	$41,760,000

For future growth trends see **"Appendix A"**
Grant County Rural Land Use Analysis: Population, Housing and UGA Land Allocations (Proulx Cearns, Inc., September 1999)

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of City of Warden, hazard events such as severe winter storms, high winds, lightning, utility shortage and fire have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
W-MH1	Structure Retrofit	Backup Power Generator for Well #6	1 of 1	$200,000

Governmental Entity:	City of Warden
Hazard Type:	Multi-hazard
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: W-MH1
Backup Power Generator for Well #6

Rationale:
Well #6 supplies the majority of water for the City's firefighting and potable water system. The well uses a turban pump to pump the water to the city's two reservoirs. When filled to capacity (2.3 mg) the reservoirs can supply water for approximately 36 hours if the two potato processors are shut down and rationing measures are implemented. Without the use of this well limits firefighting capabilities further making city infrastructure vulnerable to fire.

Relates to Plan Goal(s):	2. Reduce property damage 9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	2B. Design and retrofit essential water and sewer services to minimize the potential for disruption during a disaster. 9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.

Implementer:	City Public Works
Estimated Cost:	$200,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	117.65: 1

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of City of Moses Lake, hazard events such as severe winter storms, high winds, utility shortage and lightning have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
ML-MH1	Structure Retrofit	Backup Power Generator	1 of 1	$30,000

Governmental Entity:	City of Moses Lake
Hazard Type:	Multi-hazard
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: ML-=MH1
Emergency backup power generator for the Sage Bay sewer lift station.

Rationale:
A backup generator at Moses Lake's Sage Bay Sewer Lift Station will allow the lift station to operate continuously during interruptions in the power supply due to natural hazard events. This will reduce damage, to include environmental, caused by a sewer overflow.

Relates to Plan Goal(s):	2. Reduce property damage 5. Preserve and protect natural systems and the environment. 9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	2B. Design and retrofit essential water and sewer services to minimize the potential for disruption during a disaster. 5B. Protect valuable waterways and aquifers to insure that communities have clean potable water

	9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	City Council
Estimated Cost:	$30,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	6.11: 1

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of the Moses Lake School District, hazard events such as severe winter storms, earthquake, high winds, utility shortage and lightning have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
MLSD-MH1	Structure Retrofit	Emergency Supply Storage Building at Chief Moses Middle School	1 of 3	$150,000
MLSD-MH2	Structure Retrofit	Backup Power Generator for Moses Lake High School	2 of 3	$175,000
MLSD-MH3	Structure Retrofit	Backup Power Generator for Chief Moses Middle School	3 of 3	$250,000

Governmental Entity:	Moses Lake School District #161
Hazard Type:	Multi-hazard
Initiative Category:	Structural Retrofit
Priority:	1 of 3

Initiative Nr: MLSD-MH1
Emergency Supply Storage Building at Chief Moses Middle School

Rationale:
Build a utility self sufficient concrete building to house Red Cross and other emergency/disaster supplies adjacent to the designated shelters at the Moses High School and Chief Moses Middle School

Relates to Plan Goal(s):	9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.

Implementer:	Facilities Manager
Estimated Cost:	$150,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	7.50: 1

Governmental Entity:	Moses Lake School District #161
Hazard Type:	Multi-hazard
Initiative Category:	Structural
Priority:	2 of 3

Initiative Nr: MLSD-MH2
Backup Power Generator for Moses Lake High School

Rationale:
A backup power generator would allow the Moses Lake High School to be used as an emergency shelter in a short or long-term incident. Having backup power would allow the school to keep children at their facilities. During hazard events, or other disasters, that would cause the electrical power to fail, the High School could provide a place for area residents to go that would have lighting, heat, and other necessary facilities necessary to shelter them for extended periods of time.

Relates to Plan Goal(s):	9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	Facilities Manager
Estimated Cost:	$175,000

Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	5.33: 1

Governmental Entity:	Moses Lake School District #161
Hazard Type:	Multi-hazard
Initiative Category:	Structural
Priority:	3 of 3

Initiative Nr: MLSD-MH3
Backup Power Generator for Chief Moses Middle School

Rationale:
A backup power generator would allow the Chief Moses Middle School to be used as an emergency shelter in a short or long-term incident. Having backup power would allow the school to keep children at the school, instead of sending them home, during hazard events such as a severe winter storm that caused the power to go out; or in a long-term disaster event, the Middle School could provide a place for area residents to go that would have lighting, heat, and other necessary facilities necessary to shelter them for extended periods of time.

Relates to Plan Goal(s):	9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	Facilities Manager
Estimated Cost:	$250,000
Time Period:	2006-2010

Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	4.00: 1

Port of Moses Lake

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of the Port of Moses Lake, hazard events such as severe winter storms, transportation hazards, high winds, utility shortage and lightning have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
PML-MH1	Structure Retrofit	Install backup generator, accompanied fuel supply, and retrofit electrical system at the terminal building.	1 of 1	$200,000

Governmental Entity:	Port of Moses Lake
Hazard Type:	Multi-Hazard
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: PML-HW1
Procure and install a 500kVA emergency power generator for the Grant County International Airport Terminal Building to protect against power outages to the facility by natural, technological and societal hazards.

Rationale:
Terminal Building operations would be limited or would stop during a power outage to include Transportation Safety Agency (TSA) passenger screening facilities, Commercial airline facilities, Port of Moses Lake Administrative offices, U.S. Customs and Border Protection, and several other terminal building tenants. A short-term loss of power to the terminal building would primarily have an adverse impact on the Port of Moses Lake and other government and commercial entities in the terminal building.

Relates to Plan Goal(s):	2. Reduce property damage 9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	2B. Design and retrofit essential transportation facilities and systems to minimize the potential for disruption

	during a disaster. 9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	Port of Moses Lake
Estimated Cost:	$200,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	6.98 : 1

Northeast Region

Municipal Area	Participating Jurisdiction
Coulee City	Grant County Fire District #7, Town of Coulee City
	Coulee-Hartline School District
Coulee Dam	Town (Participated under Douglas County's Hazard Mitigation Plan. Only a three blocks is within Grant County)
Electric City	Town of Electric City
Grand Coulee	Coulee Family Medicine/Coulee Community Hospital
	Grand Coulee Dam School District
Hartline	Town of Hartline
	Port of Hartline
Krupp	Town of Krupp
Wilson Creek	Town of Wilson Creek
	Wilson Creek School District

Grant County consists of over sixty taxing districts, including municipalities, port districts, fire districts, and others led, in most cases, by volunteers or part-time officials. These diverse entities, with overlapping jurisdictions, often work regionally to address challenges including those caused by natural and manmade hazards. This regional approach was used to identify their own particular hazards and to assess their regional vulnerability to them. The Hazard Identification and Vulnerability matrix was developed by the Hazard Mitigation Task Force members from the Northeast Region.

The purpose of this section of the plan is to assess the vulnerability to the Northeast Region of Grant County in regards to the various hazards previously identified in Chapter 2 of this plan. In addition, mitigation strategies that are currently in place relating to these hazards as well as newly proposed mitigation strategies have been included in this section of the plan. To complete the vulnerability assessment process, various county staff utilized a series of forms available in the 20/20 Mitigation Software. The information collected with these forms is included in this portion of the plan.

As part of the vulnerability assessment process, officials completed an inventory of all critical facilities and have considered these critical facilities in their planning and mitigation strategy development process. *At this point, the planning process has identified over 200 critical facilities in Grant County.* However, due to post 9/11 concerns, those facilities are not listed in this document. In addition, further action will be taken to document these facilities with both photographs and Global Positioning System (GPS) coordinates in a Geographical Information Services (GIS) mapping. A list of these facilities will be made available to FEMA personnel in the event this information is required to obtain future hazard mitigation grant funding.

Representatives from local government worked closely with other agencies and Grant County Emergency Management staff to develop a comprehensive, coordinated mitigation plan intended to reduce the vulnerability to hazards within the Northeast Region of Grant County. This document presents the results of this effort to identify the specific hazards threatening Northeast Region and to identify current as well as proposed mitigation strategies, projects and/or programs to address identified vulnerabilities.

The assessment is based on the best currently available information and data regarding the characteristics of the neighborhoods identified, the hazards that threaten the people, property, and environment of these neighborhoods as well as the impacts these neighborhoods have suffered in past disasters. This information includes, when available, United States Census data, local tax records, local and national geographic information system data, Flood Insurance Rate Maps, hazard specific analyses, and other environmental and demographic facts.

However, very often authoritative or current information simply was not available for the planning effort. In these cases, the experience, knowledge and judgment of local officials were used in the planning, including assumptions and approximations that were believed to be reasonable. In addition, straight-forward, simplified technical analyses were used for tasks such as estimating property values, determining the size of populations affected, and so forth. The reliance on the judgment of knowledgeable officials and simplified analyses is considered acceptable at this stage to allow the participating organizations to complete the tasks needed to develop this multi-jurisdictional hazard mitigation plan. As the planning continues in future years, or at the time when a proposed mitigation initiative is intended to be funded and/or implemented, the participating organizations/jurisdictions recognize that additional information and analyses may be required. Local government is committed to the implementation of the mitigation-related projects/programs described in this section of the plan when and if resources become available. Local government is also committed to continuing the mitigation planning process that has resulted in the development of this document, and to the ongoing cooperation with other agencies, organizations, and jurisdictions to make Grant County more resistant to the damages and hardships that could otherwise be the result of future disasters.

Northeast Corridor Region Overview

Coulee City

Contact Information:
Robert Little, Mayor
P.O. Box 398
Coulee City, WA 99115
Telephone: (509) 632-5331
Population of Jurisdiction: 600 and unchanging
Principal Economic Base: Recreation and tourism
Economic Characteristic: Economically disadvantaged

Jurisdiction-Specific Vulnerability Assessment & Mitigation Strategies

Current Hazard Mitigation Codes/Plans/Ordinances:

- Comprehensive Land Use Plan
- Adopted Land Use/Zoning Code
- Adopted Building Code
- Adopted Fire Safety Code (Universal Fire Code)
- Participation in the National Flood Program
- Has been surveyed with a ISO rating of 7, building code class 7

Coulee City Current Land Uses and Potential for New Development

Current Land Use Category	Percent of Jurisdiction
Agricultural	80%
Commercial	5
Industrial	1
Institutional	1
Parks/restricted wild land/wildlife refuge	5
Vacant/unused government ownership	4
Residential	1

2% of Coulee City is still open to development. Little or no development is occurring and expansion, development or construction of existing properties is occurring to very few or no properties.

Coulee Dam

Contact Information:
Quincy Snow, Mayor
300 Lincoln Ave
Coulee Dam, WA 99116
Telephone: (509) 633-0320
Population of Jurisdiction: 1044 and declining
Principal Economic Base: Recreation and tourism
Economic Characteristic: Economically disadvantaged

Jurisdiction-Specific Vulnerability Assessment & Mitigation Strategies

Current Hazard Mitigation Codes/Plans/Ordinances:

- Adopted Building Code

Coulee Dam Current Land Uses and Potential for New Development

Current Land Use Category	Percent of Jurisdiction
Agricultural	30%
Commercial	2
Industrial	0
Institutional	12
Parks/restricted wild land/wildlife refuge	2
Vacant/unused government ownership	19
Residential	25

12% of Coulee Dam is still open to development. Little or no development is occurring and expansion, development or construction of existing properties is occurring to very few or no properties.

Electric City

Contact Information:
Ray Halsey, Mayor
Telephone: (509) 633-1510
Population of Jurisdiction: 495

Principal Economic Base: Recreation and Tourism
Economic Characteristic: Economically disadvantaged

Jurisdiction-Specific Vulnerability Assessment & Mitigation Strategies

Current Hazard Mitigation Codes/Plans/Ordinances:

- Adopted Land Use/Zoning Code
- Adopted fire or other life safety code
- Adopted Building Code

Electric City Current Land Uses and Potential for New Development

Current Land Use Category	Percent of Jurisdiction
Agricultural	5%
Commercial	15
Developed with mixed uses	10
Parks	15
Residential	40
Vacant/Unused 15	

15% of Electric City is still open for development. Little or no development is occurring and expansion, development or construction of existing properties is occurring to some properties.

Grand Coulee

Contact Information:
Tamara Byers, Mayor
Telephone: (509) 633-1150
Population of Jurisdiction: 926
Principal Economic Base: Recreation and tourism
Economic Characteristic: Economically disadvantaged

Jurisdiction-Specific Vulnerability Assessment & Mitigation Strategies

Current Hazard Mitigation Codes/Plans/Ordinances:

- Adopted Building Code
- Adopted Land Use/Zoning Code
- Adopted fire or other life safety code

Grand Coulee Current Land Uses and Potential for New Development

Current Land Use Category	Percent of Jurisdiction

Commercial	10
Industrial	1
Institutional	9
Parks/restricted wild land/wildlife refuge	10
Vacant/unused government ownership	12
Residential	50
Waterway/Wetland	1
Transportation/Utility Right of Way	5
Vacant/Unused	2

2% of Grand Coulee is still open to development. Little or no development is occurring and expansion, development or construction of existing properties is occurring to very few or no properties.

Hartline

Contact Information:
Jim Bergen, Mayor
Telephone: (509) 639-2606
Population of Jurisdiction: 135
Principal Economic Base: Agriculture
Economic Characteristic: Average to economically disadvantaged

Jurisdiction-Specific Vulnerability Assessment & Mitigation Strategies

Current Hazard Mitigation Codes/Plans/Ordinances:

- Adopted Building Code

Hartline Current Land Uses and Potential for New Development

Current Land Use Category	Percent of Jurisdiction
Commercial	2
Industrial	3
Vacant/unused government ownership	45
Residential	25
Other land use 25	

15% is still open to development. Little or no development is occurring and expansion, development or construction of existing properties is occurring to very few or no properties.

Krupp

Contact Information:
Tracy Lesser, Mayor
Telephone: (509) 345-2466
Population of Jurisdiction: 60

Principal Economic Base: Agriculture
Economic Characteristic: Economically Disadvantaged

Jurisdiction-Specific Vulnerability Assessment & Mitigation Strategies

Current Hazard Mitigation Codes/Plans/Ordinances:

- Comprehensive Land Use Plan
- Land use zoning
- Adopted Building Code

Krupp Current Land Uses and Potential for New Development

Current Land Use Category	Percent of Jurisdiction
Agriculture	78
Residential	12
Commercial	2
Industrial	1
Vacant/unused private ownership	3
Waterway/lake/wetland	3
Parks/restricted wild land/wild life refuge	1

8% is still open to development. Little or no development is occurring and expansion, development or construction of existing properties is occurring to very few or no properties.

Wilson Creek

Contact Information:
Katherine Bohnet, Mayor
Telephone: (509) 345-2531
Population of Jurisdiction: 240
Principal Economic Base: Agriculture
Economic Characteristic: Disadvantaged

Jurisdiction-Specific Vulnerability Assessment & Mitigation Strategies

Current Hazard Mitigation Codes/Plans/Ordinances:

- Adopted Building Code

Wilson Creek Current Land Uses and Potential for New Development

Current Land Use Category	Percent of Jurisdiction
Agriculture	10
Residential	45

Commercial	5
Industrial	10
Vacant/unused private ownership	20
Parks/recreation	2
Institutional	8

20% is still open to development. Little or no development is occurring and expansion, development or construction of existing properties is occurring to very few or no properties.

Comparison of Jurisdictional Relative Risk: Northeast Region

Hazard	Probability of Occurrence	Impacted Area	Health & Safety Impacts	Property Impacts	Environmental Impacts	Economic Impacts	Total Hazard Rating
Natural	Total Natural Hazard Risk Rating: 228						
Drought	3	4	1	1	1	2	**27**
Earthquake	1	3	1	1	0	2	**7**
Flooding	2	3	1	2	1	2	**18**
Hail	2	3	0	1	0	1	**10**
High Winds	4	4	2	1	2	2	**44**
Infestation, Disease	2	4	2	0	0	1	**14**
Landslide, Erosion	2	2	1	1	1	1	**12**
Lightning	4	4	1	1	0	1	**28**
Major Fire – Wildland	2	3	1	1	1	1	**14**
Severe Winter Storm	4	4	1	2	1	1	**36**
Volcano Activity	2	3	1	2	1	2	**18**
Technological	Technological Hazard Risk Rating: 125						
Civil Disturbance	1	2	0	1	0	1	**4**
Communications	2	4	1	0	0	1	**12**
Hazardous Materials	2	3	1	1	2	2	**18**
Loss of Electrical	3	4	1	1	2	2	**24**
Loss of Gas / Fuel	1	4	1	1	2	2	**8**
Loss of Sewer	1	2	1	1	1	1	**6**
Loss of Water	1	4	1	1	1	2	**9**
Major Fire - Urban	2	3	1	2	1	2	**18**
Radiological	1	1	1	1	1	1	**5**
Special Hazards	1	2	1	1	0	1	**5**
Transportation	2	3	1	1	1	2	**16**

Total Relative Risk: 353

Note: See table below for explanation of ratings.

Impact Area		*Probability of Occurrence*		*Health & Safety Impacts*	
0	No developed area impacted	1	Unknown but rare occurrence	0	No Health and Safety impact
1	Less that 25% of developed areas impacted	2	Unknown but anticipate an occurrence	1	Few injuries/illnesses
2	Less than 50% of developed area impacted	3	100 years or less occurrence	2	Few fatalities but many injuries/illnesses
3	Less than 75% of developed area impacted	4	25 years or less occurrence	3	Numerous fatalities
4	Over 75% of developed area impacted	5	Once a year or more occurrence		

Property Impacts		*Environmental Impacts*		*Economic Impacts*	
0	No property damage	0	Little or no environmental damage	0	No economic impact
1	Few properties destroyed - few properties damaged	1	Resources damaged with short term recovery practical	1	Low direct and/or low indirect costs
2	Few destroyed - many damaged	2	Resources damaged with long term recovery feasible	2	High direct & low indirect costs
2	Few damaged - many destroyed	3	Resources destroyed beyond recovery	2	Low direct & high indirect costs
3	Many properties destroyed and damaged			3	High direct && high indirect costs

Property at Risk

To make jurisdiction-wide analysis of the dollar value of properties at risk for each hazard type feasible and practical for mitigation planning purposes, a simplified approach has been used. The estimate of the dollar value of properties at risk for specific hazards is accomplished in the following manner: The number of structures in a specific neighborhood and the average dollar value for those structures is estimated by local planners, based on readily available data or their best judgment in the absence of suitable data.

(Note: In many cases the median value was used from recent census data when the average value was not readily available. This average value of the residences in a neighborhood somewhat undervalues the property at risk.) The percentage of the specific neighborhood threatened by the identified hazard is then estimated by local planners, again based on readily available data or their best judgment. The percent of the neighborhood at risk is then used as a multiplier to determine the estimated number of structures at risk from that hazard. This number is then multiplied by the estimated average cost of the structures to derive an estimated total value of the property at risk of damage in that neighborhood from the identified hazard. The methodology is simplistic but conservative in that it assumes structures are uniformly distributed throughout the neighborhood in relation to the area of risk that the hazard threatens the entire value of each structure, and that structures are equally vulnerable to the impacts of the hazard. The derived estimates for the dollar value of property at risk may therefore be higher than would actually be the case, but the estimates are considered satisfactory to support the local mitigation planning process.

People at Risk

The estimated total populations for each neighborhood by jurisdiction are given in the table below which are determined by local planners through readily available data or their best judgment in the absence of suitable data. If a person wanted to determine the percentage of the population at risk in a particular neighborhood, the following method should be used: multiply the percent of structures at risk by the total estimated neighborhood population. The methodology is simplistic but conservative in that it assumes occupied structures are uniformly distributed throughout the neighborhood in relation to the area of risk, that the population is present on a 24 hour, 7 day basis, and that all individuals are equally vulnerable to the impacts of the hazard event. Therefore, an estimation of the percentage of a population at risk may be higher than is actually the case, but is considered satisfactory to support the local mitigation planning process.

Grant County
Mitigation 20/20 Task ™
Estimated Value of Structures at Risk, by

	Use	Estimated Number Of Structures	Average Value of Each Structure	Percent of Structures at Risk	Total Estimated Value ($) of Structures at Risk
Coulee City					
Hazard Civil Disturbance					
Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	50%	$14,000,000
Hazard Drought					
Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	100%	$28,000,000
Hazard Earthquake					
Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	100%	$28,000,000
Hazard Flooding					
Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	100%	$28,000,000
Hazard Hail					
Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	100%	$28,000,000
Hazard Hazardous Materials					
Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	100%	$28,000,000
Hazard High Winds					
Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	100%	$28,000,000
Hazard Infestation, Disease					
Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	100%	$28,000,000

Hazard Lightning

Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	100%	$28,000,000

Hazard Loss of Electrical Service

Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	100%	$28,000,000

Hazard Loss of Gas Service

Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	100%	$28,000,000

Hazard Loss of Sewer Service

Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	50%	$14,000,000

Hazard Loss of Water Service

Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	50%	$14,000,000

Hazard Major Fire - Urban

Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	30%	$8,400,000

Hazard Major Fire -Wildland

Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	100%	$28,000,000

Hazard Severe Winter Storm

Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	100%	$28,000,000

Hazard Special Hazards

Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	100%	$28,000,000

Hazard Telecommunications

Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	50%	$14,000,000

Hazard Transportation

Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	100%	$28,000,000

Hazard Volcano Activity

Neighborhood Name					
Coulee City	Mixed Use	400	$70,000.00	100%	$28,000,000

	Use	Estimated Number Of Structures	Average Value of Each Structure	Percent of Structures at Risk	Total Estimated Value ($) of Structures at Risk
Electric City					
Hazard Civil Disturbance					
Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	25%	$5,046,625
Hazard Drought					
Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	100%	$20,186,500
Hazard Earthquake					
Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	100%	$20,186,500
Hazard Flooding					
Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	100%	$20,186,500
Hazard Hail					
Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	100%	$20,186,500
Hazard Hazardous Materials					
Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	100%	$20,186,500
Hazard High Winds					
Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	100%	$20,186,500
Hazard Infestation, Disease					
Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	100%	$20,186,500
Hazard Lightning					
Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	100%	$20,186,500
Hazard Loss of Electrical Service					

Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	100%	$20,186,500

Hazard Loss of Gas Service

Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	100%	$20,186,500

Hazard Loss of Sewer Service

Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	100%	$20,186,500

Hazard Loss of Water Service

Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	100%	$20,186,500

Hazard Major Fire - Urban

Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	75%	$15,139,875

Hazard Major Fire -Wildland

Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	50%	$10,093,250

Hazard Radiological

Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	25%	$5,046,625

Hazard Severe Winter Storm

Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	100%	$20,186,500

Hazard Telecommunications

Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	100%	$20,186,500

Hazard Transportation

Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	25%	$5,046,625

Hazard Volcano Activity

Neighborhood Name					
Electric City	Mixed Use	235	$85,900.00	100%	$20,186,500

	Use	Estimated Number Of Structures	Average Value of Each Structure	Percent of Structures at Risk	Total Estimated Value ($) of Structures at Risk
Grand Coulee					
Hazard Civil Disturbance					
Neighborhood Name					
Central	Commercial/Retail	208	$300,000.00	100%	$62,400,000
East Heights	Residential	240	$100,000.00	100%	$24,000,000
West Heights	Residential	200	$100,000.00	100%	$20,000,000
Hazard Drought					
Neighborhood Name					
Central	Commercial/Retail	208	$300,000.00	100%	$62,400,000
East Heights	Residential	240	$100,000.00	100%	$24,000,000
West Heights	Residential	200	$100,000.00	100%	$20,000,000
Hazard Earthquake					
Neighborhood Name					
Central	Commercial/Retail	208	$300,000.00	100%	$62,400,000
East Heights	Residential	240	$100,000.00	100%	$24,000,000
West Heights	Residential	200	$100,000.00	100%	$20,000,000
Hazard Flooding					
Neighborhood Name					
Central	Commercial/Retail	208	$300,000.00	40%	$24,960,000
East Heights	Residential	240	$100,000.00	40%	$9,600,000
West Heights	Residential	200	$100,000.00	40%	$8,000,000
Hazard Hail					
Neighborhood Name					
Central	Commercial/Retail	208	$300,000.00	100%	$62,400,000
East Heights	Residential	240	$100,000.00	100%	$24,000,000
West Heights	Residential	200	$100,000.00	100%	$20,000,000
Hazard Hazardous Materials					
Neighborhood Name					
Central	Commercial/Retail	208	$300,000.00	10%	$6,240,000
East Heights	Residential	240	$100,000.00	10%	$2,400,000

West Heights	Residential	200	$100,000.00	10%	$2,000,000

Hazard High Winds

Neighborhood Name					
Central	Commercial/Retail	208	$300,000.00	100%	$62,400,000
East Heights	Residential	240	$100,000.00	100%	$24,000,000
West Heights	Residential	200	$100,000.00	100%	$20,000,000

Hazard Infestation, Disease

Neighborhood Name					
Central	Commercial/Retail	208	$300,000.00	100%	$62,400,000
East Heights	Residential	240	$100,000.00	100%	$24,000,000
West Heights	Residential	200	$100,000.00	100%	$20,000,000

Hazard Landslide, Erosion

Neighborhood Name					
Central	Commercial/Retail	208	$300,000.00	15%	$9,360,000
East Heights	Residential	240	$100,000.00	15%	$3,600,000
West Heights	Residential	200	$100,000.00	15%	$3,000,000

Hazard Lightning

Neighborhood Name					
Central	Commercial/Retail	208	$300,000.00	100%	$62,400,000
East Heights	Residential	240	$100,000.00	100%	$24,000,000
West Heights	Residential	200	$100,000.00	100%	$20,000,000

Hazard Loss of Electrical Service

Neighborhood Name					
Central	Commercial/Retail	208	$300,000.00	100%	$62,400,000
East Heights	Residential	240	$100,000.00	100%	$24,000,000
West Heights	Residential	200	$100,000.00	100%	$20,000,000

Hazard Loss of Gas Service

Neighborhood Name					
Central	Commercial/Retail	208	$300,000.00	100%	$62,400,000
East Heights	Residential	240	$100,000.00	100%	$24,000,000
West Heights	Residential	200	$100,000.00	100%	$20,000,000

Hazard Loss of Sewer Service

Neighborhood Name					
Central	Commercial/Retail	208	$300,000.00	100%	$62,400,000
East Heights	Residential	240	$100,000.00	100%	$24,000,000
West Heights	Residential	200	$100,000.00	100%	$20,000,000

Hazard Loss of Water Service

Neighborhood Name					
Central	Commercial/Retail	208	$300,000.00	100%	$62,400,000
East Heights	Residential	240	$100,000.00	100%	$24,000,000
West Heights	Residential	200	$100,000.00	100%	$20,000,000

Hazard Major Fire - Urban

Neighborhood Name					
Central	Commercial/Retail	208	$300,000.00	100%	$62,400,000
East Heights	Residential	240	$100,000.00	100%	$24,000,000
West Heights	Residential	200	$100,000.00	100%	$20,000,000

Hazard Severe Winter Storm

Neighborhood Name					
Central	Commercial/Retail	208	$300,000.00	100%	$62,400,000
East Heights	Residential	240	$100,000.00	100%	$24,000,000
West Heights	Residential	200	$100,000.00	100%	$20,000,000

Hazard Special Hazards

Neighborhood Name					
Central	Commercial/Retail	208	$300,000.00	15%	$9,360,000
East Heights	Residential	240	$100,000.00	15%	$3,600,000
West Heights	Residential	200	$100,000.00	15%	$3,000,000

Hazard Telecommunications

Neighborhood Name					
East Heights	Residential	240	$100,000.00	100%	$24,000,000
West Heights	Residential	200	$100,000.00	100%	$20,000,000

Hazard Transportation

Neighborhood Name					
Central	Commercial/Retail	208	$300,000.00	30%	$18,720,000
East Heights	Residential	240	$100,000.00	30%	$7,200,000
West Heights	Residential	200	$100,000.00	30%	$6,000,000

Hazard Volcano Activity

Neighborhood Name					
Central	Commercial/Retail	208	$300,000.00	100%	$62,400,000
East Heights	Residential	240	$100,000.00	100%	$24,000,000
West Heights	Residential	200	$100,000.00	100%	$20,000,000

	Use	Estimated Number Of Structures	Average Value of Each Structure	Percent of Structures at Risk	Total Estimated Value ($) of Structures at Risk
Hartline					
Hazard Drought					
Neighborhood Name					
Hartline	Mixed Use	41	$48,500.00	5%	$99,425
Hazard Earthquake					
Neighborhood Name					
Hartline	Mixed Use	41	$48,500.00	5%	$99,425
Hazard Flooding					
Neighborhood Name					
Hartline	Mixed Use	41	$48,500.00	5%	$99,425
Hazard Hail					
Neighborhood Name					
Hartline	Mixed Use	41	$48,500.00	5%	$99,425
Hazard High Winds					
Neighborhood Name					
Hartline	Mixed Use	41	$48,500.00	10%	$198,850
Hazard Infestation, Disease					
Neighborhood Name					
Hartline	Mixed Use	41	$48,500.00	75%	$1,491,375
Hazard Landslide, Erosion					
Neighborhood Name					
Hartline	Mixed Use	41	$48,500.00	100%	$1,988,500
Hazard Lightning					
Neighborhood Name					
Hartline	Mixed Use	41	$48,500.00	10%	$198,850
Hazard Loss of Electrical Service					
Neighborhood Name					
Hartline	Mixed Use	41	$48,500.00	100%	$1,988,500
Hazard Loss of Gas Service					
Neighborhood Name					
Hartline	Mixed Use	41	$48,500.00	100%	$1,988,500
Hazard Loss of Water Service					

Neighborhood Name					
Hartline	Mixed Use	41	$48,500.00	75%	$1,491,375
Hazard Major Fire - Urban					
Neighborhood Name					
Hartline	Mixed Use	41	$48,500.00	20%	$397,700
Hazard Major Fire -Wildland					
Neighborhood Name					
Hartline	Mixed Use	41	$48,500.00	10%	$198,850
Hazard Radiological					
Neighborhood Name					
Hartline	Mixed Use	41	$48,500.00	50%	$994,250
Hazard Severe Winter Storm					
Neighborhood Name					
Hartline	Mixed Use	41	$48,500.00	20%	$397,700
Hazard Special Hazards					
Neighborhood Name					
Hartline	Mixed Use	41	$48,500.00	30%	$596,550
Hazard Telecommunications					
Neighborhood Name					
Hartline	Mixed Use	41	$48,500.00	50%	$994,250
Hazard Transportation					
Neighborhood Name					
Hartline	Mixed Use	41	$48,500.00	15%	$298,275
Hazard Volcano Activity					
Neighborhood Name					
Hartline	Mixed Use	41	$48,500.00	75%	$1,491,375

	Use	Estimated Number Of Structures	Average Value of Each Structure	Percent of Structures at Risk	Total Estimated Value ($) of Structures at Risk
Krupp					
Hazard Civil Disturbance					
Neighborhood Name					
Krupp	Residential	36	$52,500.00	25%	$472,500

Hazard Drought

Neighborhood Name					
Krupp	Residential	36	$52,500.00	100%	$1,890,000

Hazard Earthquake

Neighborhood Name					
Krupp	Residential	36	$52,500.00	100%	$1,890,000

Hazard Flooding

Neighborhood Name					
Krupp	Residential	36	$52,500.00	15%	$283,500

Hazard Hail

Neighborhood Name					
Krupp	Residential	36	$52,500.00	100%	$1,890,000

Hazard Hazardous Materials

Neighborhood Name					
Krupp	Residential	36	$52,500.00	25%	$472,500

Hazard High Winds

Neighborhood Name					
Krupp	Residential	36	$52,500.00	100%	$1,890,000

Hazard Infestation, Disease

Neighborhood Name					
Krupp	Residential	36	$52,500.00	100%	$1,890,000

Hazard Landslide, Erosion

Neighborhood Name					
Krupp	Residential	36	$52,500.00	20%	$378,000

Hazard Lightning

Neighborhood Name					
Krupp	Residential	36	$52,500.00	100%	$1,890,000

Hazard Loss of Electrical Service

Neighborhood Name					
Krupp	Residential	36	$52,500.00	100%	$1,890,000

Hazard Loss of Gas Service

Neighborhood Name					
Krupp	Residential	36	$52,500.00	100%	$1,890,000

Hazard Major Fire -Wildland

Neighborhood Name

Krupp	Residential	36	$52,500.00	50%	$945,000
Hazard Major Fire-Urban					
Neighborhood Name					
Krupp	Residential	36	$52,500.00	50%	$945,000
Hazard Radiological					
Neighborhood Name					
Krupp	Residential	36	$52,500.00	25%	$472,500
Hazard Severe Winter Storm					
Neighborhood Name					
Krupp	Residential	36	$52,500.00	100%	$1,890,000
Hazard Special Hazards					
Neighborhood Name					
Krupp	Residential	36	$52,500.00	25%	$472,500
Hazard Telecommunications					
Neighborhood Name					
Krupp	Residential	36	$52,500.00	100%	$1,890,000
Hazard Transportation					
Neighborhood Name					
Krupp	Residential	36	$52,500.00	100%	$1,890,000
Hazard Volcano Activity					
Neighborhood Name					
Krupp	Residential	36	$52,500.00	100%	$1,890,000

	Use	Estimated Number Of Structures	Average Value of Each Structure	Percent of Structures at Risk	Total Estimated Value ($) of Structures at Risk
Wilson Creek					
Hazard Civil Disturbance					
Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	15%	$479,700
Hazard Drought					
Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	100%	$3,198,000
Hazard Earthquake					

Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	100%	$3,198,000

Hazard Flooding

Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	75%	$2,398,500

Hazard Hail

Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	100%	$3,198,000

Hazard Hazardous Materials

Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	100%	$3,198,000

Hazard High Winds

Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	100%	$3,198,000

Hazard Infestation, Disease

Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	100%	$3,198,000

Hazard Landslide, Erosion

Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	50%	$1,599,000

Hazard Lightning

Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	100%	$3,198,000

Hazard Loss of Electrical Service

Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	100%	$3,198,000

Hazard Loss of Gas Service

Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	100%	$3,198,000

Hazard Loss of Water Service

Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	100%	$3,198,000

Hazard Major Fire -Wildland

Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	100%	$3,198,000

Hazard Major Fire-Urban

Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	25%	$799,500

Hazard Radiological

Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	50%	$1,599,000

Hazard Severe Winter Storm

Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	100%	$3,198,000

Hazard Special Hazards

Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	50%	$1,599,000

Hazard Telecommunications

Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	100%	$3,198,000

Hazard Transportation

Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	100%	$3,198,000

Hazard Volcano Activity

Neighborhood Name					
Wilson Creek	Residential	60	$53,300.00	100%	$3,198,000

For future growth trends see **"Appendix A"**
Grant County Rural Land Use Analysis: Population, Housing and UGA Land Allocations (Proulx Cearns, Inc., September 1999)

Grant County Fire Protection District #7

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of FPD #7, hazard events such as severe winter storms, high winds, utility shortage and lightning have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
FPD7-MH1 1-2	Structure Retrofit	Backup Power Generator	1 of 2	$50,000

Governmental Entity:	Grant County Fire Protection District #7
Hazard Type:	Multi-hazard
Initiative Category:	Structural
Priority:	1 of 2

Initiative Nr: FPD7-MH1 1-2

Procure, install propane-powered emergency electrical generator for fire station at 31190 Hwy 17N in Coulee City.

Rationale:

A power outage caused by high winds, a winter storm, lightning or other natural hazard may cause the freezing of truck pumps/tank causing as much as $400,000 in loss of equipment and the inability to respond to an emergent event.

Relates to Plan Goal(s):	9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.

Implementer:	Fire Chief
Estimated Cost:	$50,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	19.92: 1

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of the Grand Coulee Dam School District, hazard events such as severe winter storms, high winds and lightning have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
GCDSD-MH1	Structure Retrofit	Backup Power Generator	1 of 1	$50,000

Governmental Entity:	Grand Coulee Dam School District
Hazard Type:	Multi-Hazard
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: GCDSD-MH1
Backup Power Generator for Skilskin High School

Rationale:
A backup power generator would allow the Skilskin High School to be used as an emergency shelter in a short or long-term incident. Having backup power would allow the school to keep children at their facilities. During hazard events or other disasters, that would cause the electrical power to fail, the High School could provide a place for area residents to go that would have lighting, heat, and other necessary facilities necessary to shelter them for extended periods of time.

Relates to Plan Goal(s):	9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.

Implementer:	Facilities Manager
Estimated Cost:	$50,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	14.35: 1

Coulee Family Medicine/Coulee Community Hospital

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of Coulee Family Medicine/Coulee Community Hospital, hazard events such as severe winter storms, high winds, utility shortage and lightning have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
GC-MH1	Structure Retrofit	Water Distribution Contingency Plan	1 of 1	$10,000

Governmental Entity:	Coulee Family Medicine/Coulee Community Hospital
Hazard Type:	Multi-Hazard
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: GC-MH1

In the event of a loss of fresh water supply to the community hospital this plan would provide the infrastructure necessary to supply water to the hospital. This would involve the revision to the Contingency Water Plan of 1999.

Rationale:
Without fresh water the Coulee Family Medicine/Coulee Community Hospital would have difficulty providing needed medical services. This healthcare facility responsible for routine and emergent medical care within an 80 mile radius.

Relates to Plan Goal(s):	2. Reduce property damage 9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	2B. Design and retrofit essential water and sewer services to minimize the potential for disruption during a disaster. 9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.

Implementer:	Coulee Family Medicine/Coulee Community Hospital
Estimated Cost:	$10,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	164 : 1

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of the Town of Wilson Creek hazard events such as severe winter storms, high winds, lightning, and fire have been selected as the hazards of concern.

Mitigation Initiative

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
WC-MH1	Structure Retrofit	Install water well to provide additional drinking water and fire suppression flow	1 of 1	$50,000

Governmental Entity:	Town of Wilson Creek
Hazard Type:	Multi-hazard
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: WC-MH1
Install water well to provide additional drinking water and fire suppression flow.

Install generator for standby emergency power for town water well. This well provides drinking water and fire flow to the residents of the town. The town has residential areas served by these well, along with industrial and retail customers.

Relates to Plan Goal(s):	2. Reduce property damage 9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	2B. Design and retrofit essential water and sewer services to minimize the potential for disruption during a disaster. 9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	Town of Wilson Creek, Public Works
Estimated Cost:	$50,000

Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	11.25: 1

Wilson Creek School District #167

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of the Wilson Creek District, hazard events such as severe winter storms, high winds, utility shortage and lightning have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiatives that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
WCSD-MH1	Structure Retrofit	Backup Power Generator	1 of 1	$50,000

Governmental Entity:	Wilson Creek School District #167
Hazard Type:	Multi-Hazard
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: WCSD-MH1
Backup Power Generator for Wilson Creek High School

Rationale:
This initiative is proposed as joint effort between the Wilson Creek School District, Fire District #12, and the Town of Wilson Creek. A backup power generator would allow the Wilson Creek High School to be used as an emergency shelter in a short or long-term incident. Having backup power would allow the school to keep children at their facilities. During hazard events, or other disasters, that would cause the electrical power to fail, the Wilson creek High School could provide a place for area residents to go that would have lighting, heat, and other necessary facilities necessary to shelter them for extended periods of time.

Relates to Plan Goal(s):	9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or

	relocate these facilities, as needed.
Implementer:	School District, Fire District #12, and Town of Wilson Creek
Estimated Cost:	$50,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	37.50: 1

Prioritization of Hazards

After a review of the hazards threatening the Town of Coulee City, high winds and utility shortage or failure have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiative that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
CC-SH1	Structural Retrofit	Water, sewer and radio tower protection and water system upgrade.	1 of 1	$344,000

Governmental Entity:	Town of Coulee City
Hazard Type:	Multihazard
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: CC-SH1

Provide essential infrastructure retrofitting for protection of critical services.

Rationale:

In the case of extended electrical outage there is no provision to maintain the water, sewer, fire, and communication system. The town water system is unprotected from tampering.

Relates to Plan Goal(s):	2. Reduce property damage. 9. Maintain essential services, facilities and infrastructures.
Relates to Plan Objective(s):	2B. Design and retrofit essential water and sewer services to minimize the potential for disruption during a disaster. 9B. Ensure that local emergency services facilities

	can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.
Implementer:	Mayor
Estimated Cost:	$344,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	33.3: 1

Coulee-Hartline School District #151

Prioritization of Hazards

After a review of the hazards threatening the Coulee/Hartline School District, severe winter storm and utility shortage or failure have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiative that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
CHSD-1	Structure Retrofit	Backup Power Generator	1 of 1	$75,000

Governmental Entity:	Coulee-Hartline School District #151
Hazard Type:	Utility Shortage or Failure
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: TH-SH1

Backup power generator for the Coulee City Elementary School building.

Rationale:

A backup power generator would allow the Coulee City Elementary School building to be used as an emergency shelter in a disaster. Having backup power would allow the school to keep children at their facility. During hazard events that cause electrical power to fail, the building could provide a shelter that would have lighting, heat and other necessary operations to shelter people.

Relates to Plan Goal(s):	9. Maintain essential services, facilities and infrastructures.
Relates to Plan Objective(s):	9B. Ensure that local emergency services facilities can withstand the impacts of disasters. Retrofit or relocate these facilities, as needed.

Implementer:	Superintendent
Estimated Cost:	$75,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	2.04:1

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of Grant County Fire Protection District #6, natural and technological hazards have been selected as the hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiative that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
FD6-P1	Plan Coordination & Implementation	Develop and Implement an Evacuation Plan for the Town of Hartline.	1 of 1	$5000

Governmental Entity:	Town of Hartline
Hazard Type:	All-Hazards
Initiative Category:	Plan Coordination & Implementation
Priority:	1 of 1

Initiative Nr: TH-SH1

Develop and Implement an Evacuation Plan.

Rationale:

To coordinate the evacuation of town residents to safety in the event of an emergency. The plan will include procedures for activating the town siren and fire department personnel pagers and other necessary procedures for successful evacuation of the town.

Relates to Plan Goal(s):	1. Prevent loss of life and injuries.
Relates to Plan Objective(s):	1B. Ensure there are adequate systems in place to provide emergency instructions during a disaster.

Implementer:	Fire Chief
Estimated Cost:	$5000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	75.0:1

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of the Town of Hartline, severe winter storms have been selected as the hazard of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiative that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
TH-SH1	Plan Coordination & Implementation	Develop and Implement a Snow Removal Plan	1 of 1	$5000

Governmental Entity:	Town of Hartline
Hazard Type:	Severe Winter Storm
Initiative Category:	Plan Coordination & Implementation
Priority:	1 of 1

Initiative Nr: TH-SH1

Develop and Implement a Snow and Ice Removal Plan for the Town of Hartline.

Rationale:

The Town of Hartline will develop and implement a snow removal plan that will facilitate snow and ice removal from city streets. The purpose is to enable emergency response during these events and to prevent road closures. In addition, to effective snow and ice removal from roads, the plan will address snow and ice removal from structures in jeopardy.

Relates to Plan Goal(s):	2. Reduce property damage
Relates to Plan Objective(s):	2A. Design and retrofit essential transportation facilities and systems to minimize the potential for disruption during a disaster.

Implementer:	Town of Hartline, Clerk
Estimated Cost:	$5000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	20.0 : 1

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of Grant County Fire Protection District 5, high winds, severe storms and utility shortage or failure have been selected as the primary hazards of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiative that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
PH-P1	Plan Coordination & Implementation	Develop and Implement a Sheltering Plan.	1 of 1	$50,000

Governmental Entity:	Port of Hartline
Hazard Type:	All-Hazards
Initiative Category:	Plan Coordination & Implementation
Priority:	1 of 1

Initiative Nr: PH-P1

Develop and Implement a Sheltering Plan.

Rationale:

The residents of the Town of Hartline are in need of adequate facilities for emergency sheltering. At this time, the Port of Hartline owns the school gym and cafeteria facilities. The plan would identify these and other shelter locations such as churches and would rectify any changes necessary to make the sheltering options a safe, inhabitable environment during a natural or technological hazard event that warrants such. This town is in an isolated area of the county.

Relates to Plan Goal(s):	1. Prevent loss of life and injuries.
Relates to Plan Objective(s):	1A. Provide the highest degree of protection at the least cost by working with natural systems and using prevention as a first priority.

Implementer:	Port Secretary
Estimated Cost:	$50,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	20.0:1

Prioritization of Hazards

After a review of the hazards threatening the facilities and operational area of the Town of Krupp, utility shortage or failure has been selected as the primary hazard of concern.

Mitigation Initiatives

The pages that follow document the specific hazard mitigation initiative that this entity has elected to implement.

Initiative Nr	Initiative Category	Initiative Description	Priority	Estimated Cost
TK-SH1	Structural Retrofit	Replace Well Building and Install Back-up Power Generator	1 of 1	$10,000

Governmental Entity:	Town of Krupp
Hazard Type:	Technological
Initiative Category:	Structural Retrofit
Priority:	1 of 1

Initiative Nr: TK-SH1
Replace Park Well Building with a larger, reinforced building and install emergency power generator to provide water in the event of a sustained power outage.

Rationale:
The residents of the Town of Krupp obtain their water from private wells. There is no water reservoir or tank in the town. In the event of a sustained power outage, the community would have no water.

Relates to Plan Goal(s):	1. Prevent loss of life and injuries 2. Reduce property damage 9. Maintain essential services, facilities, and infrastructures.
Relates to Plan Objective(s):	1A. Provide the highest degree of protection at the least cost by working with natural systems and using prevention as a first priority. 2B. Design and retrofit essential water and sewer services to minimize the potential for disruption

	during a disaster. 9C. Ensure that utility and communications systems supporting emergency operations can withstand the impacts of disasters.
Implementer:	Town of Krupp, Mayor
Estimated Cost:	$10,000
Time Period:	2006-2010
Funding Source:	Operating budget or grants
Implementation Status:	New
Final Cost to Benefit Ratio:	4.13:1

APPENDIX A: Population Analysis

Note:
This page summarizes the role of the population analysis portion in the Grant County Comprehensive Plan.

The Grant County Comprehensive Plan, established by the Grant County Planning Department, serves as a guide for local government decision-making. The plan makes projections on the future development of the county. It addresses land use, housing, public facilities, environmental issues, population projections and many other planning elements.

For the purpose of mitigation planning, the primary focus of the comprehensive plan is on population analysis and projections because of the fact that the top priority with mitigation planning is to reduce the risks of hazards to people while preventing loss of life.

In regards to population, the Grant County Comprehensive Plan strives to project population growth in the areas of growth consistent with the Growth Management Act. The population projection should be distributed to expected areas of growth in order to establish a successful comprehensive plan. For example, while many of Grant County cities are growing rapidly, more population is distributed among unincorporated or rural areas than within cities or towns.

For the period 1998 through 2018, Grant County predicts population growth to increase by more than 50 percent. This means that from 1998 to 2018, the county can expect approximately 35,000 new residents in a twenty year time frame, amounting to a population of over 104,000 people in 2018. Grant County is one of the fastest growing counties in the State of Washington. This population forecast is the standard planning measure that incorporated cities and towns within Grant County must use in their individual comprehensive plans.

In order to accommodate for this type of growth, the county attempts to determine the number of dwelling units needed to house the growing population. This is compared with the average density within every land use designation. This means that cities must also be prepared to accommodate for the growth by establishing land use zones that include vacant areas.

This type of planning may be considered mitigation because it helps to identify where populations are at now and where they could be in the future. By comparing this with hazard areas, it may be a very effective way to prevent loss of life. This is the reason neighborhood hazard profiles were completed for the Grant County All-Hazards Mitigation Plan within each region and/or city or town. Certain neighborhoods or cities

or towns may be more at risk to some hazards than others. For more information on these and other estimations for Grant County communities, please refer to Chapter 4 of this document.

More information is available on each specific city or town on the Grant County website at: www.co.grant.wa.us by viewing the "Grant County Rural Land Use Analysis: Population, Housing and UGA Land Allocations" (Proulx Cearns, Inc., September 1999), within the Grant County Comprehensive Plan.

APPENDIX B: Resolutions Adopting the Plan

APPENDIX C: Maps

The following maps serve as general information only. They may or may not be exact depictions of where actual geographic boundaries are.

Note: These maps are not available online.

APPENDIX D: Record of Changes

CHANGE NO.	CHAPTER NO.	DATE	ENTERED BY
1	**4, pg 134**	**July 12, 2007**	**Sam Lorenz**