2008

TWIN FALLS COUNTY
ALL HAZARD MITIGATION PLAN

OCTOBER 15, 2008

Preface

The Twin Falls County All Hazard Mitigation Plan was developed in late fall of 2006 through the spring of 2008. It contains information pertaining to the hazards and hazard vulnerabilities faced by Twin Falls County. This Plan is designed to interface with the State of Idaho Multi-Hazard Mitigation Plan published in November 2004 and updated in November 2007.

This Plan has been developed as the Twin Falls County All Hazards Mitigation Plan (AHMP) however; the Plan was developed by an integrated effort from representatives from many of the jurisdictions in Twin Falls County. Each City will therefore be asked to endorse the AHMP and in turn participate in implementation of the Plan as it applies to the hazards in their respective jurisdictions. Further updates of this Plan will seek to increase multi-jurisdiction involvement.

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TWIN FALLS COUNTY IDAHO

ALL HAZARD MITIGATION PLAN

PROMULGATION OF ADOPTION

Be it known that the Twin Falls County Idaho Board of County Commissioners do hereby approve the Adoption of the Twin Falls County Idaho All Hazard Mitigation Plan and direct its implementation through the Twin Falls All Hazard Mitigation Planning Committee.

Be it also known that the Board of County Commissioners hereby directs Ms. Jackie Frey, in her role as Twin Falls County Coordinator of Emergency Services, to continue to lead the implementation of this Plan as the Twin Falls County All Hazard Mitigation Committee Chair.

This plan has been developed in the interest of providing all hazard mitigation protection to populations living in the Twin Falls County. Through adoption of this Plan, all county and private agencies are requested to develop directives, Standard Operating Procedures, checklists or other supplemental guidance to insure its maximum effectiveness.

Tom Mikesell, Chairman
Twin Falls County Commissioner — 11/24/08 Date

George Uric
Twin Falls County Commissioner — 11-24-08 Date

Terry Kramer
Twin Falls County Commissioner — 11/24/08 Date

Attest:

Kristina Glascock
Twin Falls County Clerk — 11-24-08 Date

Endorsed:

Jackie Frey, Coordinator Emergency Services — 11-24-08 Date

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U.S. Department of Homeland Security
Region X
130 228th Street, SW
Bothell, WA 98021-9796

FEMA

February 4, 2009

Honorable George Urie
Chair, Twin Falls County Commissioners
425 Shoshone St. North 4th Floor
P.O. Box 126
Twin Falls, Idaho 83303

Dear Chair Urie:

The U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) has approved the ***Twin Falls County All Hazard Mitigation Plan*** as a local plan as outlined in 44 CFR Part 201. With approval of this plan, Twin Falls County is now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through February 4, 2014.

The plan's approval provides eligibility to apply for hazard mitigation projects through your State. All requests for funding will be evaluated individually according to the specific eligibility and other requirements of the particular program under which the application is submitted. For example, a specific mitigation activity or project identified in the plan may not meet the eligibility requirements for FEMA funding, and even eligible mitigation activities are not automatically approved for FEMA funding under any of the aforementioned programs.

Over the next five years, we encourage your community to follow the plan's schedule for monitoring and updating the plan, and to develop further mitigation actions. The plan must be reviewed, revised as appropriate, and resubmitted for approval within five years in order to continue project grant eligibility.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact our State counterpart, Idaho Bureau of Homeland Security, which coordinates and administers these efforts for local entities.

Sincerely,

Mark Carey, Director
Mitigation Division

cc: David Jackson, Idaho Bureau of Homeland Security

Enclosure

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Notice of Endorsement and Participation
In the
Twin Falls County
All Hazard Mitigation Plan

I, Charles Sheridan, Mayor for the City of Buhl do hereby endorse and agree to participate in the implementation of the Twin Falls County All Hazard Mitigation Plan as it applies to the City of Buhl.

DATED this 3 day of December, 2008

CITY OF BUHL

By: Charles Sheridan

Mayor

Received by the City Clerk this 3 day of December 2008
Signature: Sharon M Keys
Clerk

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Notice of Endorsement and Participation
In the
Twin Falls County
All Hazard Mitigation Plan

I, Rita Ruffing, Mayor for the City of Castleford do hereby endorse and agree to participate in the implementation of the Twin Falls County All Hazard Mitigation Plan as it applies to the City of Castleford.

DATED this 2 day of Dec, 2008

CITY OF CASTLEFORD

By: Rita Ruffing

Mayor

Received by the City Clerk this 3 day of December 2008

Signature: [illegible]
Clerk

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Notice of Endorsement and Participation
In the
Twin Falls County
All Hazard Mitigation Plan

I, Dixie Choate, Mayor for the City of Hollister do hereby endorse and agree to participate in the implementation of the Twin Falls County All Hazard Mitigation Plan as it applies to the City of Hollister.

DATED this 17 day of February, [redacted] 2009

CITY OF HOLLISTER

By: Dixie Choate

Mayor

Received by the City Clerk this 17 day of February [redacted]

Signature: Maureen Fleeno

Clerk

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Notice of Endorsement and Participation
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Twin Falls County
All Hazard Mitigation Plan

I, David T. Overacre, Mayor for the City of Kimberly do hereby endorse and agree to participate in the implementation of the Twin Falls County All Hazard Mitigation Plan as it applies to the City of Kimberly.

DATED this 15th day of January, 2009

CITY OF KIMBERLY

By: _____

Mayor

Received by the City Clerk this _____day of _____ 2008

Signature:
Clerk

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Notice of Endorsement and Participation
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Twin Falls County
All Hazard Mitigation Plan

I, Bob Tamplemon, Mayor for the City of Filer do hereby endorse and agree to participate in the implementation of the Twin Falls County All Hazard Mitigation Plan as it applies to the City of Filer.

DATED this 26 day of Nov., 2008

CITY OF FILER

By: Bob Tamplemon

Mayor

Received by the City Clerk this 26 day of November 2008

Signature: Dawn Hall
Clerk

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Notice of Endorsement and Participation
In the
Twin Falls County
All Hazard Mitigation Plan

I, CHAD URIE, Mayor for the City of Hansen do hereby endorse and agree to and participate in the implementation of the Twin Falls County All Hazard Mitigation Plan as it applies to the City of Hansen.

DATED this 15 day of DECEMBER, 2008

CITY OF HANSEN

By: _____

Mayor

Received by the City Clerk this 15 day of DECEMBER 2008

Signature: Linda Morrill
Clerk

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Notice of Endorsement and Participation
In the
Twin Falls County
All Hazard Mitigation Plan

I, _____, Mayor for the City of Murtaugh do hereby endorse and agree to participate in the implementation of the Twin Falls County All Hazard Mitigation Plan as it applies to the City of Murtaugh.

DATED this 10 day of Dec, 2008

CITY OF MURTAUGH

By: _____

Mayor

Received by the City Clerk this _____day of _____ 2008

Signature:
Clerk

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Notice of Endorsement and Participation
In the
Twin Falls County
All Hazard Mitigation Plan

I, LANCE W. CLOW, Mayor for the City of Twin Falls do hereby endorse and agree to participate in the implementation of the Twin Falls County All Hazard Mitigation Plan as it applies to the City of Twin Falls.

DATED this 9TH day of December, 2008

CITY OF TWIN FALLS

By: _____

Mayor

Received by the City Clerk this 9th day of December 2008

Signature: _____
Clerk

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Section 1 Planning Process

Introduction

Twin Falls County, Idaho and the incorporated cities that lie within the County boundaries are vulnerable to natural, technological, and man-made hazards that have the potential to cause serious harm to the health, welfare, and security of its residents. The cost of response to and recovery from disaster events can be lessened when attention is turned to mitigating their impacts and effects before they occur or re-occur.

This Plan seeks to identify the County's hazards, understand the vulnerabilities to those hazards, and craft solutions that, if implemented, will significantly reduce threats to life and property. The Plan is based on the premise that hazard mitigation works! With increased attention to managing natural hazards, communities can reduce the threats to citizens and, through proper land use and emergency planning, avoid creating new problems in the future. Many solutions can be implemented at minimal cost and social impact.

This is not an emergency response or management plan. The Plan can certainly be used to identify weaknesses and refocus emergency response planning. Enhanced emergency response planning is an important mitigation strategy. The focus of this Plan, however, is to support better decision making directed toward avoidance of future risk and to implement activities or projects that will eliminate or reduce current risks.

Plan Organization

- Section 1 of the Plan provides a general overview of the process, the scope, purpose, and overall goals of the plan.
- Section 2 of the Plan gives a general background or description of the County's demographic, economic, cultural, and physiographic characteristics.
- Section 3 documents the public involvement component of the Plan.
- Section 4, the Risk Assessment section, provides a brief definition for each natural hazard. All hazards identified as affecting the County are analyzed at the County and incorporated City level and then summarized. For expanded definitions of the analyzed hazards refer to the State of Idaho Hazard Mitigation Plan as adopted in November 2007.
- Section 5 provides a review of the County Land Use Ordinances and Comprehensive Plan and provides suggestions for integration between this All Hazard Mitigation Plan (AHMP) and the Land Use Planning efforts in the County.
- Section 6 presents selected Mitigation Alternatives with supporting project descriptions and a "roadmap" to implementation.

Plan Use

The Plan should be used to help County and City officials plan, design, and implement programs and projects that will help reduce the jurisdiction's vulnerability to natural and technological (manmade) hazards. The Plan should also be used to facilitate inter-jurisdictional coordination and collaboration related to all hazard mitigation planning and implementation within the County and at the Regional level. Lastly, the Plan should be used to develop or provide guidance for local emergency response planning. If adopted, this Plan will achieve compliance with the Disaster Mitigation Act of 2000.

Hazard Mitigation

Hazard mitigation is defined as cost-effective actions that have the effect of reducing, limiting, or preventing the vulnerability of people, culture, property, and the environment to potentially damaging, harmful, or costly hazards. Hazard mitigation measures which can be used to eliminate or minimize the risk to life, culture and property, fall into three categories:

1) Those that keep the hazard away from people, property, and structures,
2) Those that keep people, property, or structures away from the hazard, and
3) Those that reduce the impact of the hazard on victims, i.e., insurance.

Hazard mitigation measures must be practical, cost effective, and culturally, environmentally, and politically acceptable. Actions taken to limit the vulnerability of society to hazards must not, in themselves, be more costly than the anticipated damages.

Hazard mitigation planning must be based on vulnerabilities and its primary focus must be on the point where capital investment and land use decisions are made. The placement of capital investments, whether for homes, roads, public utilities, pipelines, power plants, or public works, determine to a large extent the nature and degree of a community's hazard vulnerability. Once a capital facility is in place, there is little opportunity to reduce hazard vulnerability through correction of errors in location or construction. It is for this reason that often the most effective mitigation tools are zoning and other ordinances that manage development in high vulnerability areas, and building codes that ensure that new buildings are constructed to withstanding the damaging forces of anticipated hazards.

Because disaster events are generally infrequent, the nature and magnitude of the threat is often ignored or poorly understood. Thus, the priority to implement mitigation measures is low and implementation is slowed. Mitigation success can be achieved, however, if accurate information is portrayed through complete hazard identification and impact studies, followed by effective mitigation management.

The Federal Emergency Management Agency has identified hazards to be analyzed by each jurisdiction, completing an All Hazard Mitigation Plan. The hazards analyzed in this Plan include the following:

Natural Hazards

- Weather: Drought
  - Extreme Heat
  - Extreme Cold
  - Severe Winter Storm
  - Lightning
  - Hail
  - Tornado
  - Straight Line Wind
- Flooding: Flash Flood
  - River Flooding
  - Dam Failure
- Geologic: Earthquake
  - Landslide/Mudslide
- Other: Wildfire
  - Biological
    - Pandemic/Epidemic
      - Bird Flu
      - SARs
      - West Nile

Technological (Manmade) Hazards

- Structural Fire
- Nuclear Event
- Hazardous Material Event
- Riot/Demonstration/Civil Disorder
- Terrorism

Purpose

The purposes of this Plan are to:

- Fulfill Federal and local mitigation planning responsibilities;
- Promote pre- and post-disaster mitigation measures with short/long range strategies to minimize suffering, loss of life, impact on traditional culture, and damage to property and the environment;
- Eliminate or minimize conditions that would have an undesirable impact on the people, culture, economy, environment, and well being of the County at large.
- Enhance elected officials', departments', and the public's awareness of the threats to the community's way of life, and of what can be done to prevent or reduce the vulnerability and risk.

Scope

This is a County based All Hazard Mitigation Plan and as such does not meet the requirements of a Multi-Jurisdiction Plan however; the Plan covers the areas within Twin Falls County Idaho including incorporated cities which will be requested to participate in the implementation of the Plan.

Mission Statement

The Twin Falls County All Hazards Mitigation Plan sets forth public policy designed to protect citizens, critical facilities, infrastructure, private and public property, the local economy, and the environment from risks associated with natural and manmade hazards.

Goals

AHMP goals describe the broad direction that Twin Falls County agencies, organizations, and citizens will take to select mitigating projects that are designed specifically to address risks posed by natural and manmade hazards. The goals are stepping-stones between the mission statement and the specific objectives developed for the individual mitigation projects.

Severe Weather

- Twin Falls County will develop methods to mitigate the losses due to severe weather in the County.

Flooding

- Twin Falls County will continue to participate in the National Flood Insurance Program and develop actions that will reduce the damage to County infrastructure due to flash and stream flooding.

Geological

- Twin Falls County will reduce potential damage to County infrastructure and structures through implementation of earthquake mitigation techniques.
- Twin Falls County will reduce the potential damage to property from Landslides by adopting codes and standards for construction in landslide prone areas.
- Twin Falls County will tightly control building on the Snake River Canyon Rim.

Wildfire

- Twin Falls County will reduce the losses caused by wildfire by continuing the Wildland Urban Interface Mitigation Program.

Biological

- Twin Falls County seeks to reduce the exposure of humans and animals to the West Nile Virus.
- Twin Falls County will identify risks to livestock from potential biological threats.

Structural Fire

- Twin Falls County will seek to reduce losses from Structure fires.

Nuclear Event

- Twin Falls County will examine the risks posed to the County from Nuclear Facilities and Improvised Nuclear Device.

Hazardous Material Event

- Twin Falls County will identify hazardous materials transported through the County.

Riot/Demonstration/Civil Disorder

- Twin Falls County will develop methods to identify and report Civil Disobedience activities.

Terrorism

- Twin Falls County will identify measures to protect critical County infrastructure and facilities from potential terror incidents.

Twin Falls All Hazard Mitigation Planning Committee

The Twin Falls All Hazard Mitigation Planning Committee was formed on October 25, 2006. Committee membership is comprised of representatives from the Twin Falls County Local Emergency Planning Committee, Twin Falls County Department heads, representatives from the Transportation Districts and the incorporated cities, representatives from the major utility providers, interested media, and members of the public. Minutes of the committee meetings are provided in Attachment 1.

The Committee Roster is provided below:

Committee Members

Agency	Representative	Position
TFCO Emergency Service	Jackie Frey	Coordinator
TFCO Commission	Tom Mikesell	Chairman
TFCO Planning and Zoning	Sue Switzer	Administrator
TFCO Extension	Charlotte Eberlein	Agent
TFCO Sherrif	Steve Nutting	
SIRRCOMM	Linda Lickly	
Twin Falls Highway District	Dave Burgess	Engineer or Supervisor
Buhl Highway District	Harold Miller or John Zamora	Engineer or Supervisor
Filer Highway District	Pat Scheer	Engineer or Supervisor
Murtaugh Highway District	Carl Gooch	Engineer or Supervisor
Buhl Fire	Earl Tyree	
Twin Falls Canal Company	Vince Alberti or Brian Olmstead	Manager
Salmon Falls Canal Compay		
King Hill Irrigation		
Bell Rapids Irrigation		
Eastern Idaho Railroad		Safety
Williams Pipeline	Fred Link	Safety
Chevron Pipeline		Safety
Idaho Power	Dan Olmstead	Operations
Intermountain Gas	Rick Moore	Operations

Agency	Representative	Position
City of Twin Falls	Lance Bates	Public Works
City of Filer	Bud Compher	Public Works
City of Castleford	Rita Ruffing	Public Works
City of Hansen		Public Works
City of Kimberly		Public Works
Twin Falls City Police	Dan Lewin	
Buhl Police	Eric Foster	
South Central District Health	Rene LeBlanc Karen Goodale Georgia Ford	Director
Idaho State Police	Robert Storm	
Idaho Department of Transportation	C. Dwight	District Engineer
Idaho Bureau of Homeland Security	Gary Davis	Field Officer
Bureau of Reclamation		
Bureau of Land Management		
Forest Service	Buz Vanskike	Fire Management
Twin Falls Council on Aging	Jim Fields	Representative
General Public/Rock Creek	James Gose-Eells	
General Public/Canyon Rim		
General Public/Canyon Floor		
Times-News		Reporter
USDA	David Owens	
Idaho Department of Health and Welfare	John Hathaway	
Department of Environmental Quality	Bill Allred	
College of Southern Idaho	Jerry Beck or Doug Maughn (PIO)	
Kimberly School District	Ted Wasko	
Filer High School	Yolanda Cabello	
MV Paramedics	Gilbert Schmidt	
American Red Cross	Cathy Lemming	
SLMVRMC	Marlene Rodger	
SLMVRMC Safety	Doug Lee	
SLPHD	Georgia Ford	

Planning Process

One of the key, necessary steps of this Planning Process was the organization of a Twin Falls County Hazard Mitigation Committee. The Committee was established under the direction of the Twin Falls County Director of Emergency Management Services.

Figure 1.1 illustrates the Fifteen Step Planning Process that was used in the development of the Twin Falls AHMP.

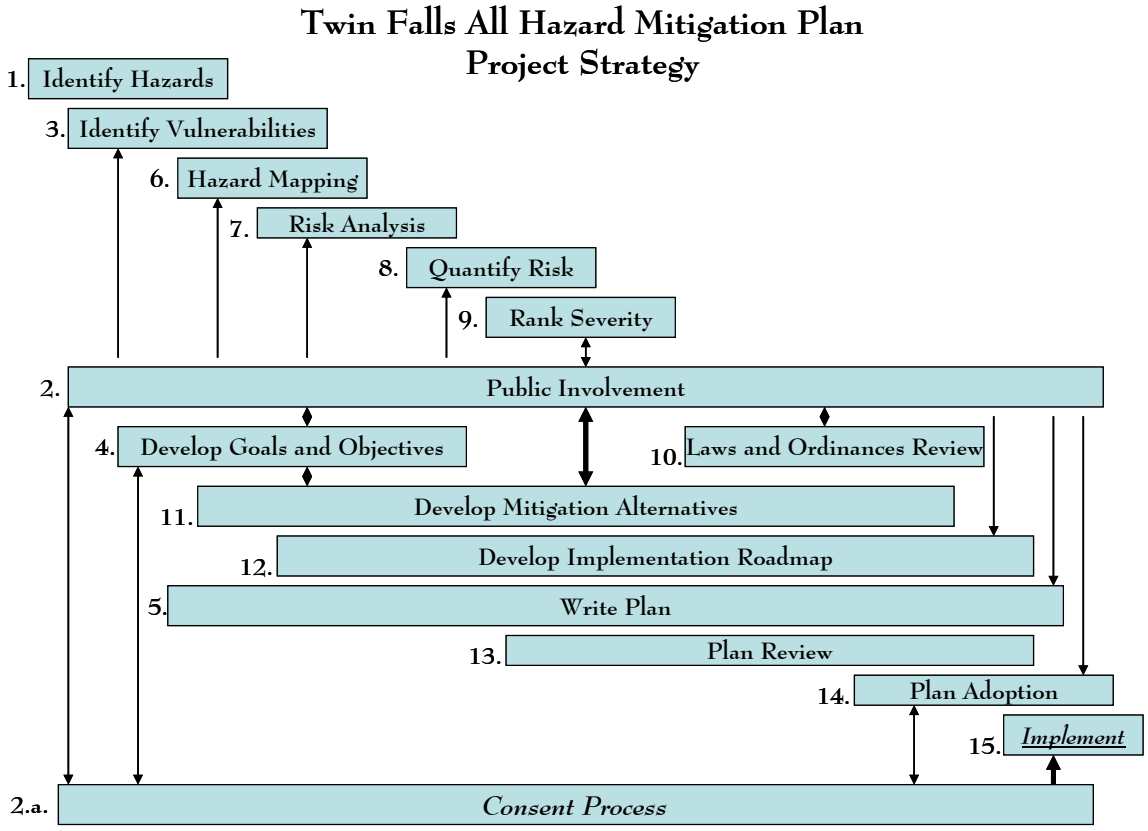

Figure 1.1
Fifteen Step Planning Process

Step 1 Identify Hazards

Twin Falls County hazards were identified and their frequency of occurrence evaluated using a number of resources including:

- Hazard planning documents developed by State, Federal and private agencies,
- National Weather Service weather data from the past 50 years, and
- 100 year historical analysis of hazardous event occurrences published local newspapers (archived on microfilm at Idaho State University).

Step 2 Public Involvement

A community survey was mailed to 300 residents of Twin Falls County. A copy of the Survey and its results is located in Attachment 2 and discussed in some detail in Section 3. Additionally the members of the committee were requested to provide, through a short worksheet instrument, their opinions as private citizens regarding the risk posed to the County. This was done at the first AHMP Committee meeting.

Step 3 Identify Vulnerabilities

The Committee examined the potential effects on the County of the listed raw hazards by identifying vulnerable populations, infrastructure, critical services, facilities, and the environment. Vulnerabilities were geographically identified using Geographical Information System (GIS) technology and then linked to a GIS database describing the vulnerable target including potential damage and estimates of losses.

Step 4 Develop Goals and Objectives

As required by FEMA, the planning effort was centered on community supported hazard reduction goals to be implemented and evaluated based on measurable objectives. Mitigation projects are to be assessed against the established goals and objectives to ensure that the selected projects reduce risk as desired.

Step 5 Write Plan

The Plan outline meets and in some instances exceeds the requirements set forth by FEMA in the FEMA PDM Criteria Crosswalk. Plan drafts were presented in hard and electronic copy as requested by the Committee. The finished Plan includes information on Plan adoption including a promulgation page for the County and an agreement to participate page for each incorporated City.

Step 6 Hazard Mapping

As described in Steps 1 and 4 Hazard Maps are extremely important in illustrating hazard and vulnerability locations. Information used to conduct the risk assessment and to make loss estimates was linked electronically to the maps using GIS technology. The electronic versions of these maps were provided to the Committee and other reviewing agencies.

Step 7 Risk Analysis

A risk analysis was conducted using the information gathered in steps 1-4 and 6. For each hazard, two kinds of information are required in order to assess risk; information concerning the potential amount of damage a hazard event can cause (hazard magnitude), and that pertaining to how frequently such events are likely to occur (hazard frequency). To the extent that such data can be obtained quantitatively, "risk" may then be determined as the product of the hazard's magnitude and its frequency. In practice, precise quantitative data of both kinds is most often difficult or impossible to obtain.

Frequency of occurrence for a given hazard may be estimated using historical records. The value of frequency estimates obtained in this way is subject to the existence of such records, their availability, and their accuracy. Even with good historical records, however, projections of future frequency may not be valid because of changing conditions. Long- and short-term climate cycles (among other factors) affect weather events, economic conditions and technical advances affect man-made hazards, land use and the passage of

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Table 1.1 – Frequency Level Criteria

time affect geological hazards, etc. For this reason, scientific projections, when available, are also used to modify, enhance or replace those made from historical data. For any given location, however, historical records are often scarce and/or unreliable, and scientific projections methods either do not exist or require data that has not been, or cannot be gathered. Thus, a third source of frequency data is utilized in this Plan; the subjective judgments of the location's inhabitants. While semi-quantitative at best, and subject to biases, data of this sort may well be as reliable as any other. It reflects, in any event, the perceived needs of those for whom the planning is being done. Frequency projection data from all three sources was used, as appropriate in this plan. Because all are subject to considerable uncertainty, the composite data was examined and assigned a relative level based on the criteria shown in Table 1.1, Frequency Level Criteria.

Hazard magnitude estimates, too, must rely on data gathered from a number of sources, none of which may be precise. Historical data, scientific projections, and inhabitants' subjective judgments are, again, used for this purpose. Magnitude estimates are generally based on the severity of potential impact on three critical vulnerabilities: human life, property, and the environment. FEMA has, however, recognized that there are other issues tied to community support of risk mitigation including social, cultural, and economical issues. Composite data from all sources, including the vulnerabilities identified in Section 4.7, for the County and for each local jurisdiction has been utilized to assign a quantitative magnitude for each hazard, based on the following criteria:

Repetitive Loss designation**s** are used to eliminate or reduce the damage to property and the disruption of life caused by repeated damage, such as flooding, of the same properties. The criteria to determine repetitive loss includes the following:

- Four or more losses of more than $1,000 each in a 5 year period; or
- Two losses within a 10-year period that, in the aggregate, equal or exceed the current value of the insured property; or
- Three or more paid losses that, in the aggregate, equal or exceed the current value of the insured property.

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

Table 1.2 – Magnitude Level Criteria

A hazard's total magnitude is the sum of the values for each of the five categories. Thus, a hazard event that is expected to require Reconstruction Assistance from the State government, affect an area consisting of Multiple Sections, cause Little to no Injury and No Deaths, Require Little Sheltering or cause Some Economic Loss, and have a Warning Lead Time of Hours, would be assigned a magnitude of 15 (4+4+1+2+4).

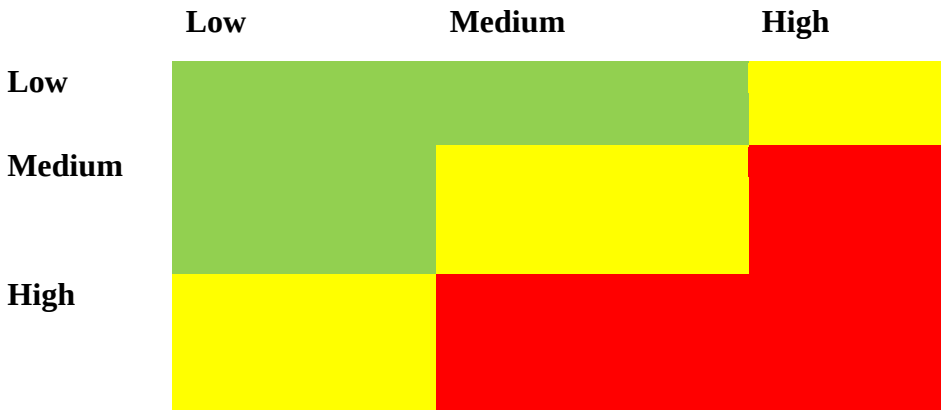

Table 1.3 – Magnitude/Frequency

Risk assessment methods included the use of FEMA's HAZUS but, because of limitations associated with this data, Twin Falls County's own current GIS property valuation data was primarily used to generate loss estimates.

Risk assessment activities also included the mapping of hazard occurrences, at-risk structures including critical facilities, and repetitive flood loss structures, land use, and populations.

Step 8 Quantify Risk

Once a hazard's magnitude and its frequency have been evaluated, a picture of the over-all risk severity associated with that hazard emerges. Because the values are necessarily imprecise and subjective, the risk is visualized by plotting them as shown in Table 1.3. Here, the frequency is plotted on the vertical axis (Low at the top to High at the bottom), and magnitude is on the horizontal axis (For example: Low = 5 to 11, Medium = 11 to 18, and High = 19 to 40). Hazards with the most severe associated risk, therefore, appear toward the lower right while lowest severity risk hazards appear near the upper left.

Step 9 Rank Severity

To assist in prioritizing mitigation activities, the severities of all hazards considered in the Plan are ranked relative to one another using the above plotting schemer. Prioritization is also based on goals and objectives developed and approved by the Twin Falls County Board of County Commissioners.

Step 10 Laws and Ordinances Review

The Twin Falls Comprehensive Plan and other applicable codes, standards, ordinances, and laws were reviewed against the list of ranked hazards to determine if there were any restrictions to, or enabling powers that impact possible hazard mitigation alternatives. A report of this action is provided in Section 5, Land Use Planning.

Step 11 Develop Mitigation Alternatives

Potential projects to address identified risk have been developed and are listed in Section 6. The project descriptions and associated roadmaps address approximate costs, possible returns on investments, and environmental and socio-economic benefits. Engineering cost estimates based on the conceptual design will be included in Section 6.

Step 12 Develop Implementation Roadmap

Roadmapping is essentially the development of a high level project schedule. The Mitigation Roadmap in Section 6 of the Plan outlines necessary steps to be taken and the order in which they should occur to ensure successful project implementation. The Implementation Roadmap addresses the 4 highest priority mitigation projects identified during the planning effort and includes possible funding options. Other possible mitigation projects are identified in list form and linked to the Plan Goals and Objectives, the desired outcome, and the assigned agency or department.

Step 13 Plan Review

The initial plan review was conducted by the Committee during Plan development. The Committee assessed the Plan using the most current FEMA AHMP Review Crosswalks Once the Plan was completed, it was submitted, along with the completed the Cross Walk, to the Idaho Bureau of Homeland Security's Hazard Mitigation Officer, and then to FEMA Region 10's Hazard Mitigation Officer for review. The Twin Falls County Board of County Commissioners also reviewed the Plan in a parallel time frame.

Step 14 Plan Adoption

The Twin Falls Mitigation Committee made a formal public presentation to the Twin Falls County Board of County Commissioners seeking their approval of the Plan. A letter of promulgation is provided in the Plan. Additionally each participating jurisdiction was requested to adopt the Plan by resolution with the respective mayors signing the appropriate participation document.

Step 15 Implement

To initiate implementation, the Twin Falls Mitigation Committee presented the completed Plan to the County Board of Commissioners.

Plan Maintenance

The Twin Falls County AHMP maintenance process includes a schedule for annual monitoring and evaluation of the programmatic outcomes established in the Plan and for producing a formal Plan revision every five years.

Formal Review Process

The Plan will be evaluated on an annual basis to determine the effectiveness of programs and to reflect changes that may affect mitigation priorities. The evaluation process includes an annual schedule and timeline, and identifies the local agencies and organizations participating in Plan evaluation. The Coordinator of Emergency Services or designee will be responsible for contacting the Mitigation Committee members and organizing the annual review. Committee members will be responsible for monitoring and evaluating the progress of the mitigation strategies in the Plan.

The Committee will review the goals and action items to determine their relevance to changing situations in the County, as well as changes in Federal policy, and to ensure they are addressing current and expected conditions. The Committee will also review the risk assessment portion of the Plan to determine if this information should be updated to in light of any new data. The coordinating organizations responsible for the various action items will report on the status of their projects, the success of various implementation processes, difficulties encountered, success of coordination efforts, and which strategies should be revised or removed.

Every five years the updated plan will be submitted to the State of Idaho Bureau of Homeland Security's Mitigation Program and the Federal Emergency Management Agency for review.

Continued Public Involvement

Twin Falls County Emergency Services is dedicated to involving the public directly in the review and updates of the Plan. The Coordinator is responsible for the annual review and update of the Plan. The public will also have the opportunity to provide input into Plan revisions and updates. Copies of the Plan will be catalogued and kept at all of the appropriate County departments and outside agencies. The existence and location of these copies will be publicized in the local newspaper following each annual review and update.

Public meetings will be held when deemed necessary by the Coordinator. These meetings will provide the public with a forum where they can express concerns, opinions, or new alternatives that can then be included in the Plan. The Board of County Commissioners will be responsible for using County resources to publicize the annual public meetings and maintain public involvement.

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Section 2 Twin Falls County Description

Twin Falls County is the most populous county in central Idaho. It is home to the College of Southern Idaho and the famous Shoshone Falls, sometimes called the Niagara of the West, with an impressive 212 foot drop. The County is not only a retail hub for most of central Idaho, but is also a recreational hot spot for travelers. The County has eight incorporated communities, including Buhl, Castleford, Filer, Hansen, Hollister, Kimberly, Murtaugh, and Twin Falls City. Unincorporated communities include, Roseworth, Berger, Rogerson, and Rock Creek. The majority of these communities are located along the northern edge of the County near the Snake River.

Location

Twin Falls County is located in south central Idaho on the north edge of the Great Basin in an area known as the Magic Valley. It comprises 1,957 square miles and is bordered on the north by the Snake River and Gooding and Jerome Counties, on the west by Owyhee County, on the east by Cassia County, and on the south by the Nevada border.

Topography and Geography

This area and a large portion of southern Idaho are described as a semiarid steppe environment receiving approximately 8-10 inches of precipitation annually. Native vegetation in this climate type primarily consists of 10-15 species of sagebrush and bunchgrasses. The map in figure 2.1 shows that the vast majority of the County is relatively flat making it ideal for extensive agricultural development. The southwest corner, however, consists mostly of gently rolling hills that extend into Nevada. These slopes are fairly mild, but unsuitable for farming and are primarily managed by the Bureau of Land Management (BLM) or privately owned ranches. The USDA Forest Service (USFS) owns the steeper slopes rising in the southeast corner of the County where elevation reaches a height of approximately 7,200 feet with stunted subalpine vegetation communities on the upper slopes[1].

[1] Schlosser, William E., 2004, Twin Falls County WUI Wildfire Mitigation Plan. Page 27

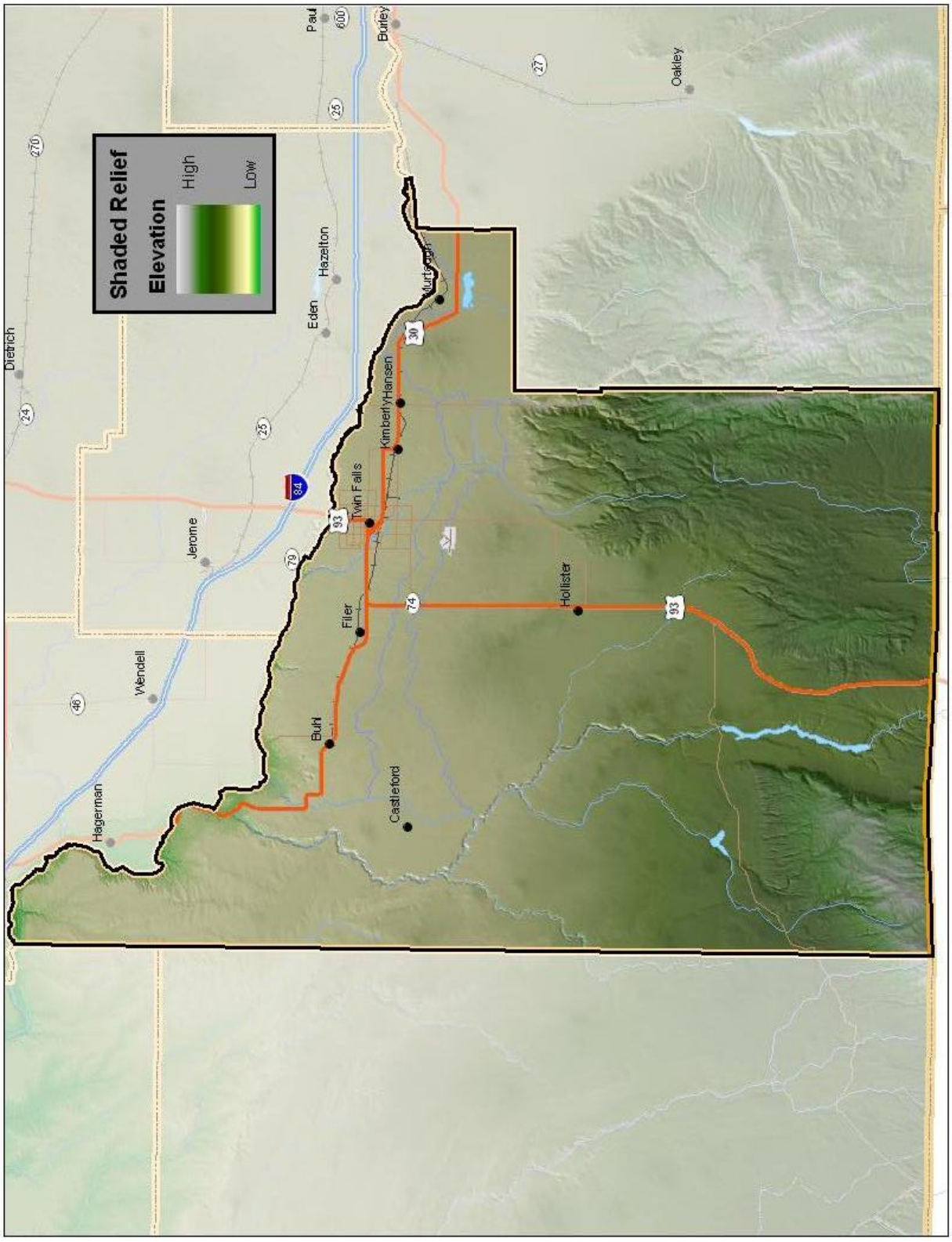


Figure 2.1
Twin Falls County shaded relief

Lakes and Rivers

The only major body of water in the County is the Snake River, which forms the northern border of the County and runs through the spectacular Snake River Gorge. During the Great Migration over the Oregon Trail, and still today, the Snake River was a large financial entity in Twin Falls County, providing many recreational and economic resources. Other important bodies of water in the County are Murtaugh Lake, Salmon Falls Creek Reservoir, Salmon Falls Creek, Cedar Creek Reservoir, and a multitude of small streams, springs and irrigation canals. Water area makes up less than 1% of the total area in the County.

Geology

Notable geological features in Twin Falls County are generally from two sources. The first and most prominent is volcanic activity. Figure 2.2 show the general dispersion of volcanic deposits throughout the valley. The second is from the great flood of ancient Lake Bonneville. The map in figure 2.2 below identifies different geological formations throughout the County.

The southwestern area of the valley includes the South Hills or Cassia Mountains, made of a felsic pyroclastic rock. This is visible in Rock Creek Canyon as spectacular piles of north dipping rhyolite ash flows. Under these rhyolites are Pennsylvanian and Permian sedimentary rocks that are of mixed carbonate and shale. Also exposed in the Cassia mountains and a small area southeast of Hollister are Mesozoic marine sediments of limestone, dolomitic limestone, quartzite and chert[2].

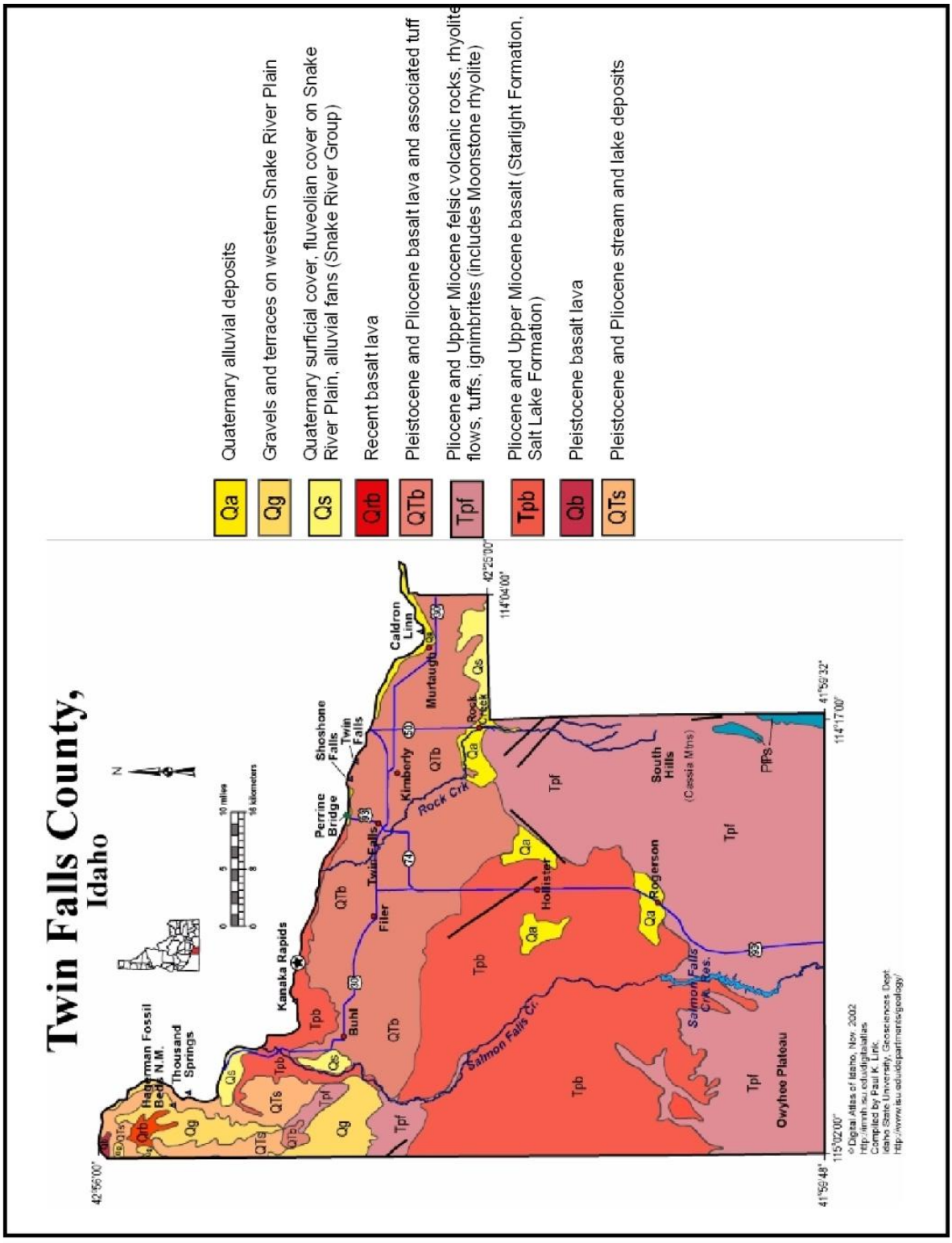
To the northwest are the foothills of the Owyhee Plateau, also underlain by felsic pyroclastic and mafic volcanic flow and Miocene ignimbrites.

The Snake River, with its spectacular canyon deepened during the Lake Bonneville Flood about 15,000 years ago, forms the northern boundary of the County. Shoshone Falls cascades over Miocene rhyolite of the same age as the ash flows in the South Hills. The Twin Falls is cut in Quaternary basalt. Huge gravel bars of "melon gravel" line the Snake River Canyon west of Twin Falls City near Buhl and Hagerman. Also along the Snake Rivers are large amounts of alluvial deposits left from the flood of Lake Bonneville.

In the northwestern corner of the County are the Pliocene fossils beds of Hagerman Fossil Beds National Monument. These river and lake beds contain diverse mammal, fish, reptile and other fossils that are about 3 to 4 million years old[3].

Thermal water is prevalent throughout the County, but is primarily found in the northern portion of the County near Buhl, Filer and Twin Falls. The area around Hollister and Rogerson also contains springs and wells that produce thermal water, probably from fractures in the volcanic rock underneath[4].

[2] Idaho Department of Water Resources, 1990, Geothermal Resources Analysis in Twin Falls County, Idaho Part 2, Page 4
[3] http://imnh.isu.edu/digitalatlas/counties/geomaps/geomap.htm
[4] Idaho Department of Water Resources, 1990, Geothermal Resources Analysis in Twin Falls County, Idaho Part 2. Page 6



Figrure 2.2

Twin Falls Geologic Map

Climate

Twin Falls County, at an elevation of 3,729 feet, experiences a dry climate with relatively low humidity. Average annual precipitation is 9.3 inches and average annual snowfall is 18.6 inches. The average length of the growing season, based on freeze-free temperatures, is 133 days, from May 13 to September 23. Table 2.1 provides an overview of the average temperature in Twin Falls County. Table 2.2 provides an overview of the average 24 hour temperature while Table 2.3 provides an overview of the average minimum temperature. Note that the highest average temperature is 84.9 degrees F in July and the average low temperature is 18.7 degrees F in January.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
°C	1.7	5.3	9.8	14.8	19.6	24.7	29.4	28.6	23.1	17.1	8.6	2.7	15.5
°F	35.1	41.5	49.6	58.6	67.3	76.5	84.9	83.5	73.6	62.8	47.5	36.9	59.9

Table 2.1
Average Temperatures in Twin Falls County

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
°C	-2.8	0.4	3.7	7.6	12.1	16.7	20.4	19.4	14.2	8.9	2.8	-2.1	8.5
°F	27.0	32.7	38.7	45.7	53.8	62.1	68.7	66.9	57.6	48.0	37.0	28.2	47.3

Table 2.2
Average 24 hour Temperatures in Twin Falls County

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
°C	-7.4	-4.5	-2.3	0.3	4.6	8.7	11.4	10.2	5.4	0.7	-2.9	-7.0	1.4
°F	18.7	23.9	27.9	32.5	40.3	47.7	52.5	50.4	41.7	33.3	26.8	19.4	34.5

Table 2.3
Average Minimum Temperature in Twin Falls County

Land Ownership and Land Use

The map in Figure 2.3 below shows the distribution of Federal and non-Federal lands in Twin Falls County. Table 2.4 shows the distribution of land type. Of the 1,232,064 total land acres within the County, 640,399 are owned by the Federal Government (52% of total) and 558,124 are privately owned (45% of total). In 1997, there were 456,378 acres spread among 1,439 farms. Approximately 1,208 of those farms were in crops. Total acres in crops were 308,139[5]. Potatoes, corn, sugar beets, peas, grain, malt barley, and alfalfa are commonly grown in Twin Falls County. Twin Falls County is the largest producer of dry beans, and second largest producer of alfalfa hay, and the third largest producer of silage corn in the State of Idaho. Other crops grown are oats, peas, apples, peaches, pears, sweet cherries, apricots, and nectarines. There are about 125 acres of orchards located mostly in the Snake River canyon[6]. Commercial cattle raising operations and industries associated with beef production are also very widespread. 543,946 of the total acres (44%) in the County are managed by the BLM, much of which

[5] http://community.idaho.gov/Portals/15/Profiles/County/TwinFalls.pdf
[6] http://extension.ag.uidaho.edu/twinfalls

has been leased for livestock grazing. Livestock production provides almost one-half of the agricultural income, and accounts for about 65% of the land use in the area.[7]

Land Use Type in Twin Falls County		
Land Use	Total Acres	Percent
Urban	7,800	0.6%
Agricultural	372,500	29.7%
Rangeland	857,100	68.3%
Forest	8,800	0.7%
Water	8,200	0.7%

Table 2.4 – Land use type in Twin Falls County
Source: Idaho Department of Labor

Resource dependency

The incorporated communities of Twin Falls County have been evaluated by the University of Idaho, College of Natural Resources Policy Analysis Group (PAG) for their degree of natural resource dependency. Idaho communities with more than 10% employment in resource-based sectors (wood products, travel & tourism, agriculture, and mining) were evaluated by PAG. Their findings indicate that Buhl, Filer, Hollister, Murtaugh, and Castleford are "Agriculture Only" dependent communities. Twin Falls City is considered a "Travel and Tourism" dependent community. Kimberly and Hansen are a combination of "Travel & Tourism and Agriculture" dependent. The group further evaluated Idaho communities based on their level of direct employment in several industrial sectors[8]. Their findings for incorporated communities in Twin Falls County are summarized in table 2.5 below.

Natural Resource Dependency					
Community	Economic Diversity Index	Agriculture	Timber	Travel & Tourism	Mining & Minerals
Buhl	Med. High	Med. High	Low	Med. Low	Low
Castleford	Med. High	High	Low	Low	Low
Filer	High	Med. High	Low	Med. Low	Low
Hansen	Med. Low	Med. High	Low	Med. High	Low
Hollister	Low	High	Low	Low	Low
Kimberly	Med. High	High	Low	Med. High	Low
Murtaugh	Med. Low	High	Low	Low	Low
Twin Falls	High	Low	Low	Med. High	Low

A "low" level of direct employment represents 5% or less of total employment in a given sector, "med low" 6 to 10%; "med high" 11 to 19%; and "high" 20% or more of total employment in a given sector.

Table 2.5 – Natural resource dependency for communities in Twin Falls County

[7] Schlosser, William E. 2004. Twin Falls County WUI Wildfire Mitigation Plan, Page 27
[8] Schlosser, William E., 2004. Twin Falls County WUI Wildfire Mitigation Plan, Page 29

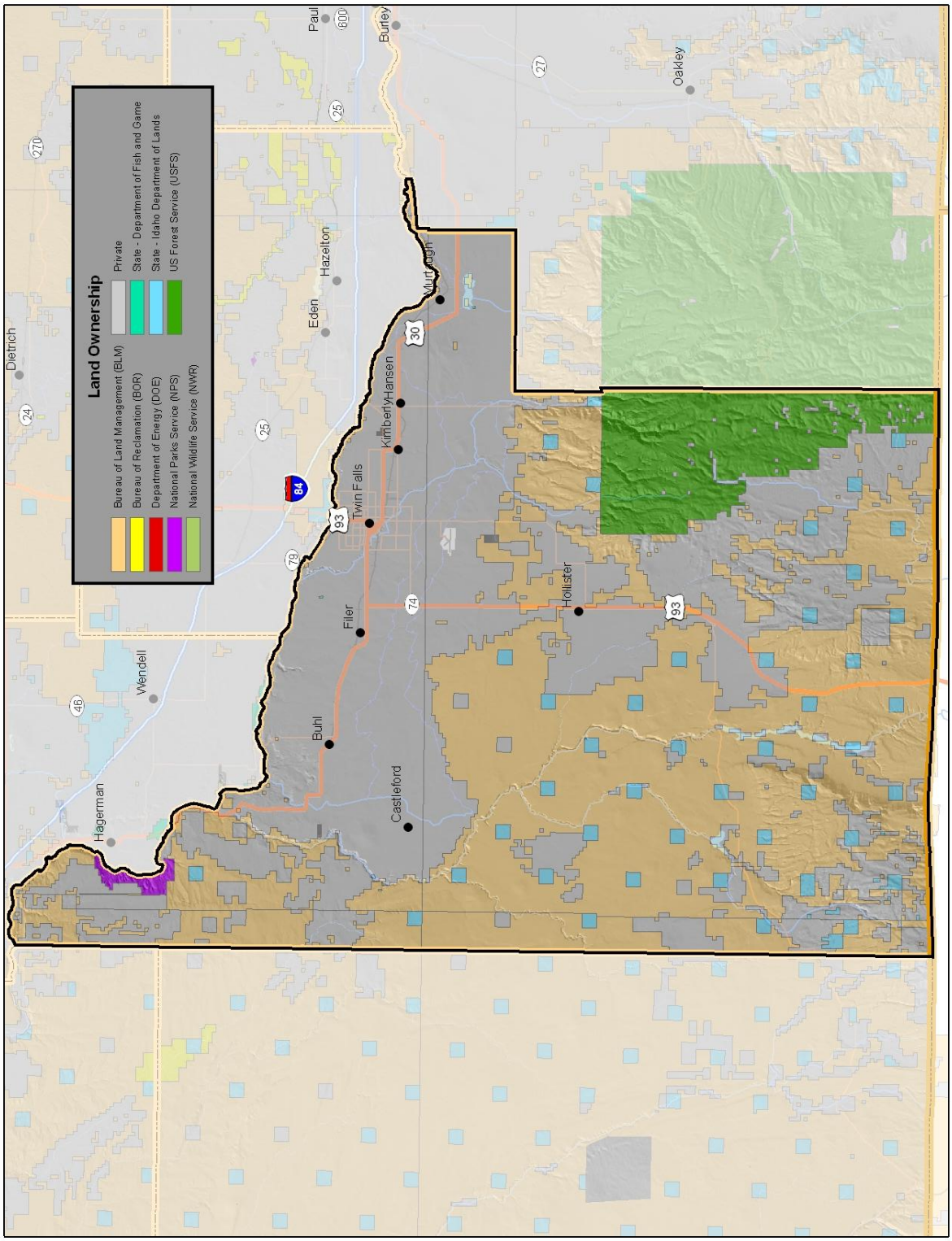


Figure 2.3
Land Ownership by Agency

History

Archeologists have found evidence of prehistoric man in the area dating back some 13,500 years and many Indian writings and other artifacts were found during settlement of the area. The Twin Falls County area was not known to white men until the Wilson Price Hunt party attempted to float the Snake River to the Columbia in October 1811. From that time, fur traders, early settlers heading to Oregon, gold miners, and cattlemen frequented the area along the Snake River. An early entrepreneur, Herman Striker, built the Rock Creek Store just southeast of present day Twin Falls City. It was successful because it was the only place between Fort Hall and Boise where travelers could obtain supplies[9]. In 1864 a station was established at Rock Creek for the Ben Holladay Stage Line. The Twin Falls South Side project brought water to thousands of acres of arid land in 1904 and became one of the most successful of the Carey Act irrigation projects. Twin Falls County was established February 21, 1907 with its county seat at Twin Falls City and was named for the nearby waterfalls on the Snake River. By 1912, Twin Falls City, then known as the Magic City, had fulfilled the hopes of its original planners. Where there was once only a sage brush desert, the town now had a business district, three large brick schools, a civic center, tree lined streets, and many large and spacious homes[10].

Recreation

The County offers numerous recreation spots, both developed and undeveloped. The Snake River provides many recreational opportunities including sportsman access points for fishing, camping and picnicking as well as a site for viewing the Shoshone Falls. The river also offers boating, rafting and swimming opportunities. Salmon Falls Creek Reservoir, located approximately 7 miles from Rogerson off U.S. Highway 93, provides developed camp sites, excellent year-round fishing, boat ramps, hiking and picnic facilities. Murtaugh Lake is located just off US 30 near Murtaugh and offers picnicking, boating, wildlife viewing and waterfowl hunting but is closed during the colder months. The Sawtooth National Forest along the eastern boundary of the County has several developed campsites and trails. Balanced Rock is a unique natural feature located near Castleford. Twin Falls County maintains a small park near the site offering picnicking facilities. The Hagerman Fossil Beds National Monument covers a large portion in the northwestern most region of the County. There are also several hot springs in the County. Banbury Hot springs off Hwy 30 near Buhl offers an outdoor pool with a slide and diving board, hot baths and jacuzzis, along with campground facilities, a picnic area and a boat ramp. Miracle Hot Springs, also located near Buhl, has 19 private pools and 2 outdoor swimming pools, and Nat-Soo-Pah Hot springs off Hwy 93 in Hollister offers camping, swimming, and picnicking.

The canyons, open deserts and rangelands, and rolling hills in the uplands provide year-round outdoor opportunities for hunters, fishermen, water and winter sports enthusiasts, picnickers, hikers, campers, sightseers, and photographers. Fishing in the County's rivers, streams, reservoirs, and lakes is a favorite activity of many people.

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[9] Rickets, Virginia. 1988. Greater Twin Falls Area Historical Guide, Twin Falls County Historical Preservation Commission.

[10] http://www.idaho.gov/aboutidaho/county/twinfalls.html

Urban recreational facilities, such as parks, ball fields, playgrounds, swimming pools, tennis courts, and golf courses are in or around the major population centers[11].

Demographics

U.S. Census Bureau population data for Twin Falls County and its eight incorporated cities for the years 1990, 2000, and 2005 are shown in Table 2.6 below.

Total Population and Population Change from 1990 to 2005					
	1990	2000	2005	% change from 1990-2000	% change from 2000-2005
Twin Falls County	53,580	64,284	69,419	20%	8.0%
Twin Falls City	27,591	34,469	38,630	25%	12%
Buhl	3516	3985	4015	13%	.7%
Castleford	179	277	274	54.7%	(1)%
Filer	1511	1620	1768	7.2%	9.1%
Hansen	848	970	961	14.4%	(.9)%
Hollister	144	237	236	64.6%	(.4)%
Kimberly	2367	2614	2686	10.4%	2.8%
Murtaugh	134	139	138	3.7%	(.7)%

Table 2.6 – Population changes for Twin Falls County and its incorporated cities.
Source: Idaho Department of Labor

Total County population in 2005 was estimated at 69,419, excluding those living in institutions, group quarters, and college dormitories. Between 1990 and 2000 the County population grew 20% from 53,580 to 64,284 as compared with the State of Idaho which grew by 28%[12]. Of the eight incorporated cities, Twin Falls City has by far the largest population with 38,630 as of the 2005 census updates, comprising nearly 56% of the total County population. Over the entire 15 year period, Twin Falls City grew by slightly more than 15% while the County grew by around 10%. The population growth pattern outside Twin Falls City has changed in the last two decades. Between 1990 and 2000 Castleford and Hollister, which are located further from Twin Falls City than the other communities, had population increases of around 50%. Since 2000, however, their populations have decreased slightly while the urban area of Twin Falls City and areas in closer proximity have continued to grow. In 2004 rural Twin Falls County (those living in unincorporated areas) was 20,349, roughly 30% of the total population.

As of 2005, the County has an estimated 29,596 housing units with approximately 27,569 of those households occupied and about 2,027 unoccupied. Population density is approximately 34 persons per square mile.

U.S. Census Bureau data for the year 2006 gives the following reported ethnicity distribution for Twin Falls County:

- Black persons 0.2%
- American Indian and Alaska Native persons 0.8%

[11] Schlosser, 2004
[12] Rasker, 2006

- Asian persons 0.9%
- Native Hawaiian and Other Pacific Islander 0.1%
- Persons reporting two or more races 1.2%
- Persons of Hispanic or Latino origin, percent 11.5%
- White persons not Hispanic 85.7%

The median age in Twin Falls County increased from 29.4 in 1980 to 33.8 in 2000, perhaps because more people are choosing to retire there.

Economic profile

Twin Falls County is located in one of the most agriculturally productive areas in the world and for many years the economy was strongly tied to agriculture. In the last 10 years, however, the County has seen a shift in its economic profile as illustrated in Figure 2.4. As shown, the Services and Professional industry has grown from 51.9% in 1970 to 61.1% in 2000. At the same time Farm and Agricultural Services declined from 17.6% to 10.5%.

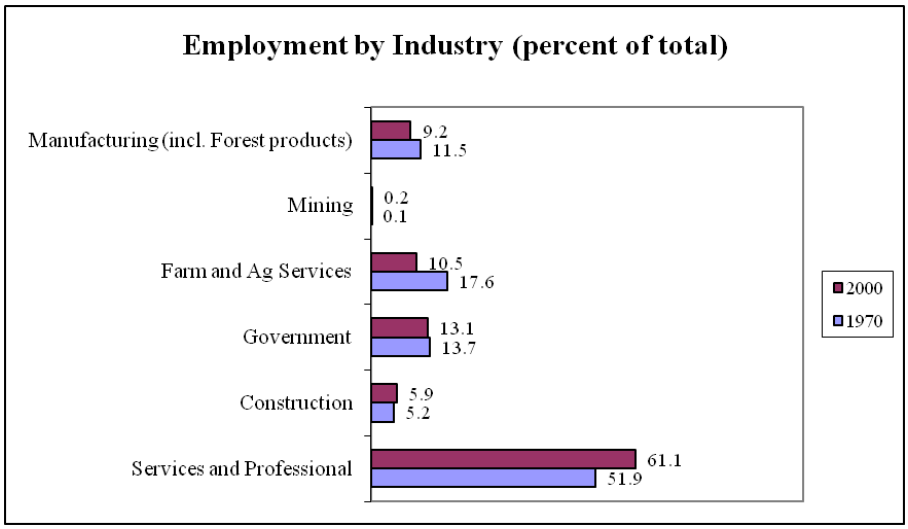


Figure 2.4
Employment by Industry for Twin Falls County (percent of total)

Figure 2.5 below shows the same change in the Services industry, as well as Retail Trade, but in real number of jobs among a wider variety of industries. Figure 2.6 shows that the Services and Retail Trade industries have also grown in personal income.

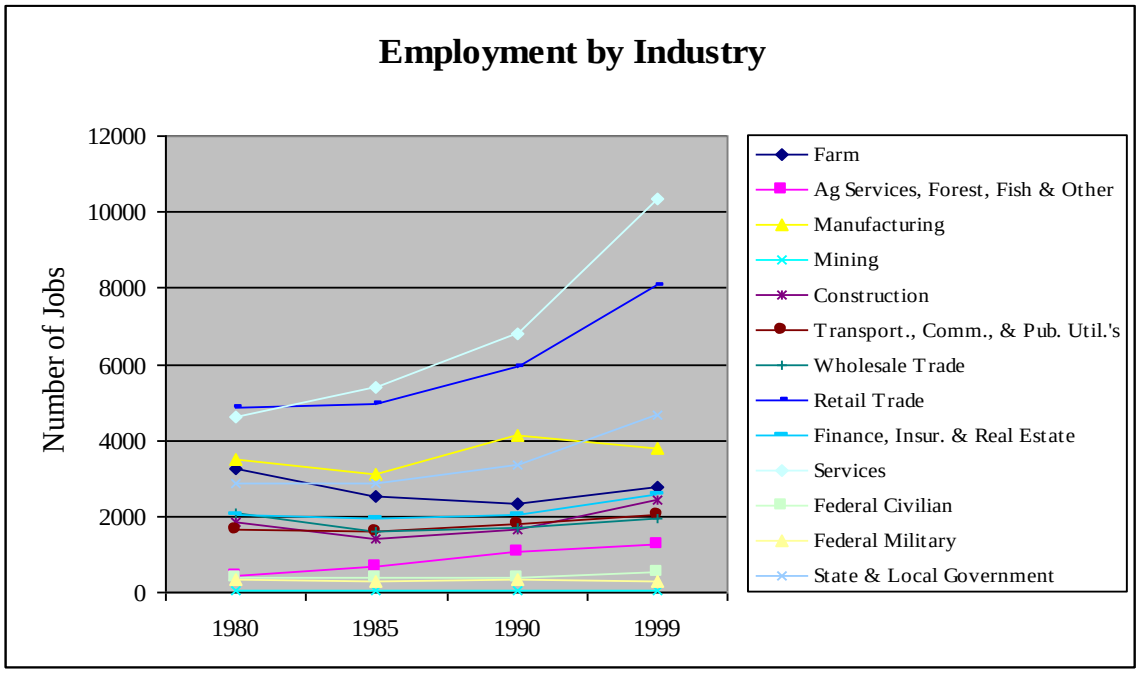


Figure 2.5
Employment by Industry for Twin Falls County
Source: Bureau of Economic Analysis

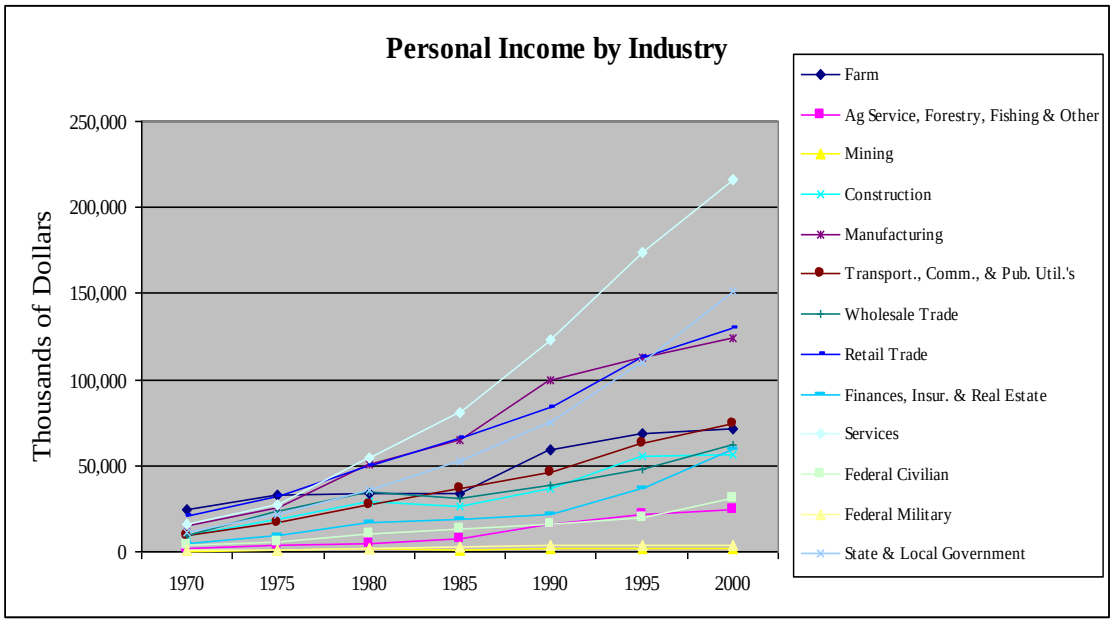


Figure 2.6
Personal Income by Industry for Twin Falls County
Source: Bureau of Economic Analysis

Still, agriculture contributes solidly to the County's economic well-being. Since the 1970's net farm income has increased steadily and remains an important part of the 1.6 billion dollar County economy. The primary reason for the changes shown in Figures 2.5 and 2.6 is that most of the new jobs in the County are in the Services and Professional sector[13].

Non-labor income has also grown steadily in Twin Falls County and represents about 1/3 of the County economy (Figure 2.7).

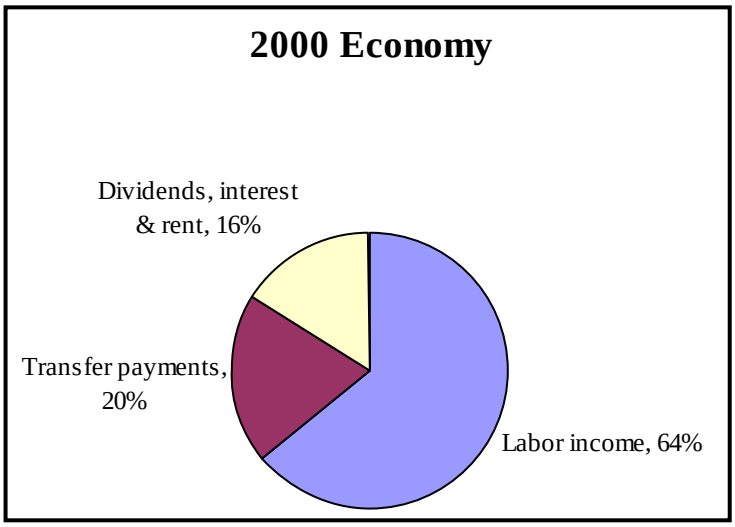


Figure 2.7
Source of Personal Income for Twin Falls County in 2000
Source: Bureau of Economic Analysis

The economic health of the County is reflected in the fact that since 2000, the County unemployment rate has been lower than that of the State of Idaho as well as the nation as a whole. In 1992, County unemployment peaked at 6.9 percent but has moved to a healthy 2.8 percent in 2006. This marked improvement in unemployment figures may be attributed to, among other factors, the diversification of the county economy and to new job creation. From 1970 to 2004, 23,106 new jobs were created[14].

Despite strong employment growth in Twin Falls County, income remains relatively low (see Figure 2.8). In 1980, per capita income was $8,803, increasing to $25,217 in 2004. Still, this is below the State average of $26,877 and the U.S. average of $33,050. Twin Falls County ranks 11th out of Idaho's 44 counties for per capita income.

Average earnings per job in 1980 were $10,876 and in 2004 had risen to $24,096, and again, this is below both the State and national averages of $29,317 and $38,798 respectively. In fact, when earnings per job are adjusted for inflation, the numbers have actually fallen[9]. Twin Falls County ranks 25th out of Idaho's 44 counties for average earnings per job. The reason for the low wages may be that most of the new jobs are in the retail and service sector where wages are typically low.

[13] Richards, 2006
[14] Rasker, 2006; Idaho Commerce and Labor, 2007

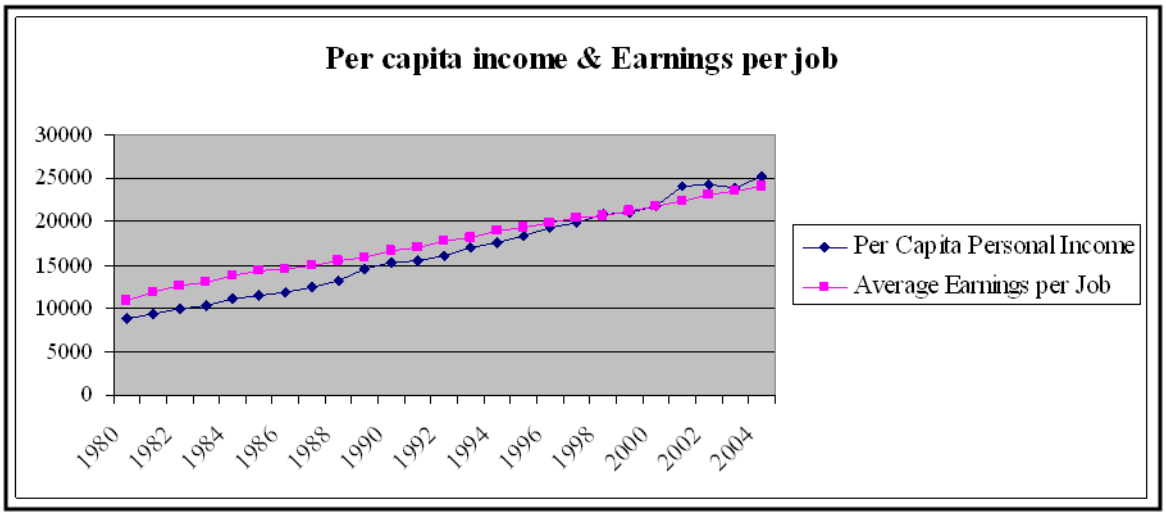


Figure 2.8
Per Capita Income and Average Earnings per Job for Twin Falls County
Source: Bureau of Economic Analysis

In the year 2000, Twin Falls County households earn a median income of $34,506 annually. Figure 2.9 below shows the median income for each incorporated community in the County for 2000. Twin Falls city, Hollister and Kimberly were the only communities above the County median[15].

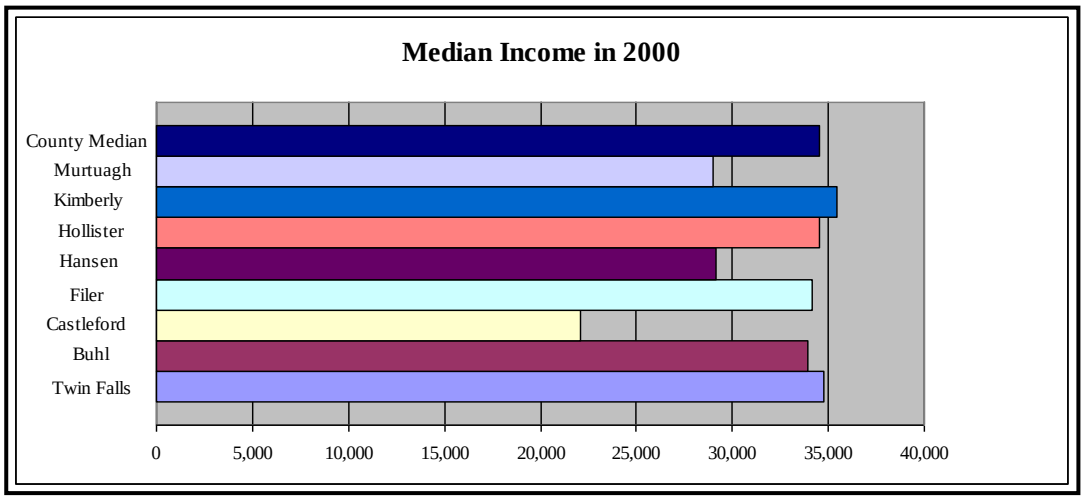


Figure 2.9
Median Income for Incorporated Cities in Twin Falls County

In 2003, 12% of the population was living below the poverty line and this percentage has remained fairly constant since 1979. Another measure of poverty is the percent of students who qualify for the reduced-price or free lunch programs in the public school system. This number has risen from 40.7% during the 1999-2000 school year to 48.6% during the 2002-2003 school year for all County schools (a total of seven school

[15] Schlosser, William E., 2004. Twin Falls County WUI Wildfire Mitigation Plan, Page 24

districts). The Murtaugh, Hansen and Castleford School Districts have seen the most change and have the highest percent of students who quality for that program.

The percent of owner-occupied housing units is 64%, with 30% being renter-occupied. The median value of owner-occupied housing almost doubled between the years 1990 and 2000, rising from $50,700 to $93,800[16]. Housing in Twin Falls County is quite affordable with a Housing Affordability Index of 150, meaning that only $26,500 in income was required to buy the median house in 2000. The median rent in 1990 was $235, rising to $489 in 2000. Most renters pay between 10 and 30% of their income for rent, while 14% pay more than 50% of their income for rent. Between 1990 and 2000, 4,353 new housing units were built.

[16] US Census, 2007

Section 3 Public Involvement

Public Involvement

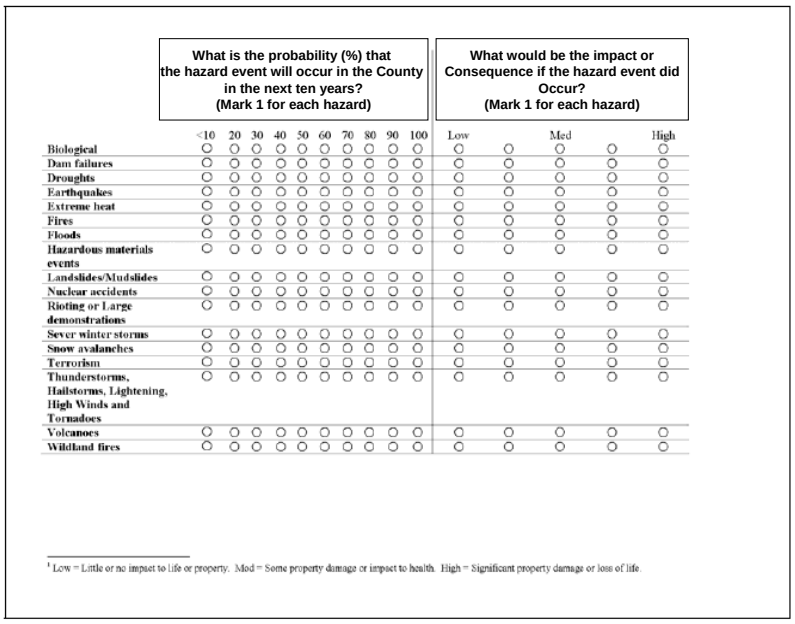
Public Involvement in the All Hazard Mitigation Process has three distinct objectives; documenting risk perception, development of risk reduction requirements, and solicitation of support for mitigation actions. Information gathering tools were utilized to gain a subjective measure of how the public believes the risks impact their community. These results were then used to assist in the development of requirements for risk reduction projects. This involvement of the public serves to validate and raise awareness of the planning process and, thus, generate support for elected and appointed officials as they seek to implement the mitigation actions identified in the AHMP.

Risk Perception:

Risk perception is the subjective judgment that people make about the characteristics and severity of a risk. The phrase is most commonly used in reference to natural hazards and threats to the environment or health, such as nuclear power. Several theories have been proposed to explain why different people make different estimates of the magnitude of risks. Risk perception is a significant part of the Public Involvement Section of the Twin Falls County All Hazard Mitigation Planning Process. Two distinct tools were used to gather public input and to measure, at least subjectively, the public attitudes towards the risk posed by the hazards in Twin Falls County. The more quantitative Committee Perception Tool was used to access the expertise of the members of the All Hazard Mitigation Committee while the Public Questionnaire gathered more subjective opinions from a representative segment of the general public.

Committee Perception Tool

Members of the All Hazard Mitigation Committee in reality play two important roles. First, in the role of agency representative, each member; 1) ensures that the interests of their agency are expressed and included in the planning process, 2) acts as a subject matter expert on issues and matters managed by the agency, and,)3 identify methods to reduce or mitigate risk. Second, each member serves as an individual with certain expertise, but also with certain attitudes, knowledge, and biases that qualify them as excellent "expressers" of public perception.



	What is the probability (%) that the hazard event will occur in the County in the next ten years? (Mark 1 for each hazard)										What would be the impact or Consequence if the hazard event did Occur? (Mark 1 for each hazard)				
	<10	20	30	40	50	60	70	80	90	100	Low		Med		High
Biological	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Dam failures	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Droughts	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Earthquakes	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Extreme heat	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Fires	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Floods	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Hazardous materials events	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Landslides/Mudslides	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Nuclear accidents	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Rioting or Large demonstrations	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Sever winter storms	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Snow avalanches	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Terrorism	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Thunderstorms, Hailstorms, Lightening, High Winds and Tornadoes	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Volcanoes	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Wildland fires	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

[1] Low = Little or no impact to life or property. Mod = Some property damage or impact to health. High = Significant property damage or loss of life.

A Risk Perception Tool was used in the first three committee meetings to measure the committee members' perception of the hazards posed and of the severity of the impact from those hazards upon their own personal life situations. An example of the Perception Tool is illustrated above.
The results from the three applications of this tool are in Attachment 1, Meeting Minutes. As the committee met together the results for some hazards changed. As education on the hazard and its relative risk was provided, individual committee members' perceptions changed. Table 3.1 (below) demonstrates that change.

Hazard Type	Probability of Occurrence in Next 10 Years By Percentage		Level of Impact if Event Occurred	
	Begin	End	Begin	End
Biological	Split	Low	High	High
Dam Failure	Low	Low	High	Medium
Droughts	Medium	High	Low	Medium
Earthquakes	Medium	Low	Medium Low	Medium High
Extreme Heat	High	Low	Medium	Medium High
Fire (Structure)	Split	High	Medium	Medium
Floods	Split	Medium	Medium	Medium High
Hazardous Materials Events	Split	Split	Medium	Medium
Landslides/Mudslides	Medium	Low	Low	Low
Nuclear Accidents	Low	Low	Low	Medium High
Rioting or Large Demonstrations	Low	Low	Low	Low
Severe Winter storm	High	High	Medium	Medium
Snow Avalanches	Low	Low	Low	Low
Terrorism	Low	Low	Low	Low
Thunderstorms, Hailstorms, Lightening, High winds, Tornadoes	High	High	Medium	Medium
Volcanoes	Low	Low	Split	Split
Wildland Fires	High	High	Medium	Medium

Table 3.1
Changes made in the committee's perceptions of hazards

As illustrated above the AHMP Committee experienced some change in perception during the early process. The Committee's final perceptions of the top five hazards in terms of probability of occurrence (from highest to lowest) were expressed as follows:

1. Drought
2. Structure Fire
3. Severe Winter Storm
4. Thunderstorms, Hailstorms, Lightning, High Winds, Tornadoes
5. Wildland Fire

The Committee also experienced some change in their perception as to how severely the hazards would impact the community. The Committee's final perceptions of the top five hazards in terms of level of impact (from highest to lowest) were expressed as follows:

1. Biological
2. Earthquakes
3. Extreme Heat
4. Floods
5. Nuclear Accidents

Note that none of the hazards perceived as most probable are listed in the top five based on the levels of impact. For instance, the Committee ranked Drought first (1st) from the standpoint of probability of occurring but seventh (7^{th}) for level of impact.

Public Questionnaire

A public questionnaire was provided to three hundred (300) residents of the County. Of the three hundred mailed, sixty-two (62) were returned for a return rate of twenty percent (20%). This return rate is very similar to that found during the course of twelve (12) other AHMP Projects. The complete text of the questionnaire is provided in Attachment 2 and written responses.

The following is a sampling of the results:

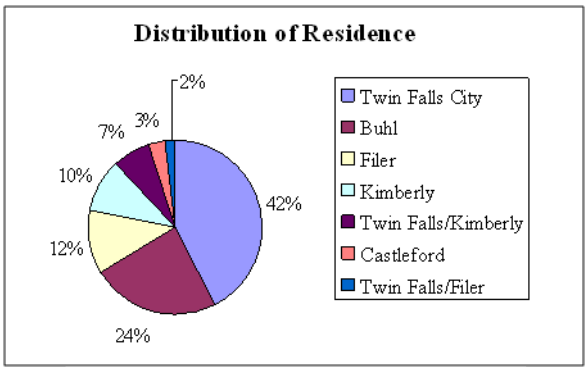


Figure 3.1
Distribution of Residence

Question 1:

What town do you live in or near?

The distribution of the respondents is very similar to the distribution of the population in Twin Falls County, an indication that the results are a good representation of the attitudes of the entire community.

Question 3:

How concerned are you about the possibility of our community being impacted by a disaster?

The fact that 76% of the respondents are only somewhat concerned about being impacted by a disaster is in alignment with the overall risk assessment of the County (See Section 4.7) The low number, 5% of the respondents are extremely concerned by the impacts of a disaster should be expected in Twin Falls County. People who are "extremely concerned" cited such issues as hazards related to the Idaho National Laboratory, releases of hazardous materials, and community water quality.

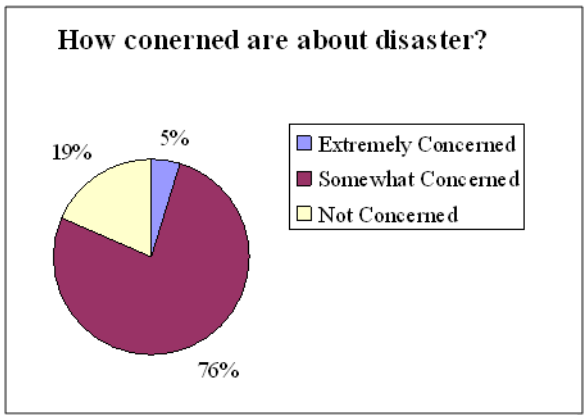


Figure 3.2
How concerned are you about disaster?

Question 4:
Please select the five highest hazards facing your neighborhood.

The results from this survey listed the five highest hazards facing the community as:

1. High Winds/Hail Storms
2. Drought
3. Blizzards
4. Air Quality
5. Infections Disease

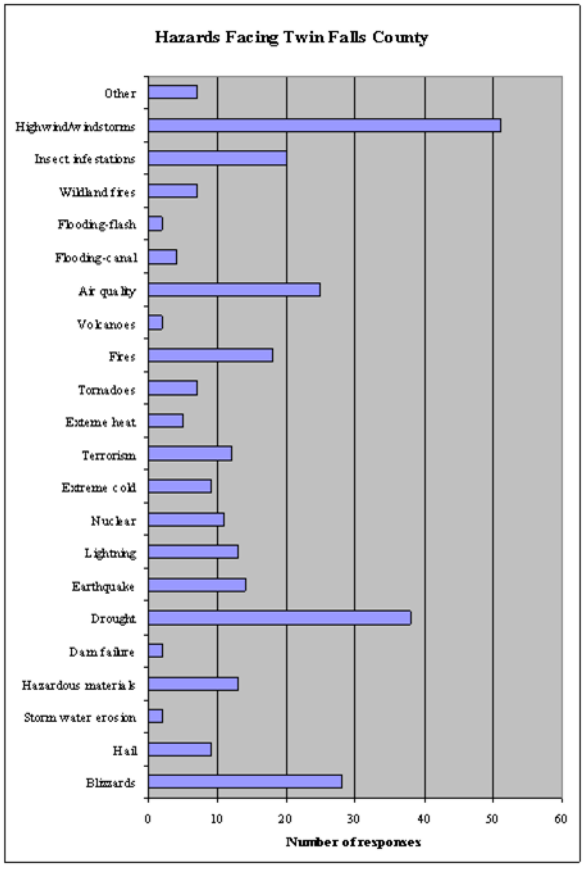


Figure 3.3
Hazards Facing Twin Falls County

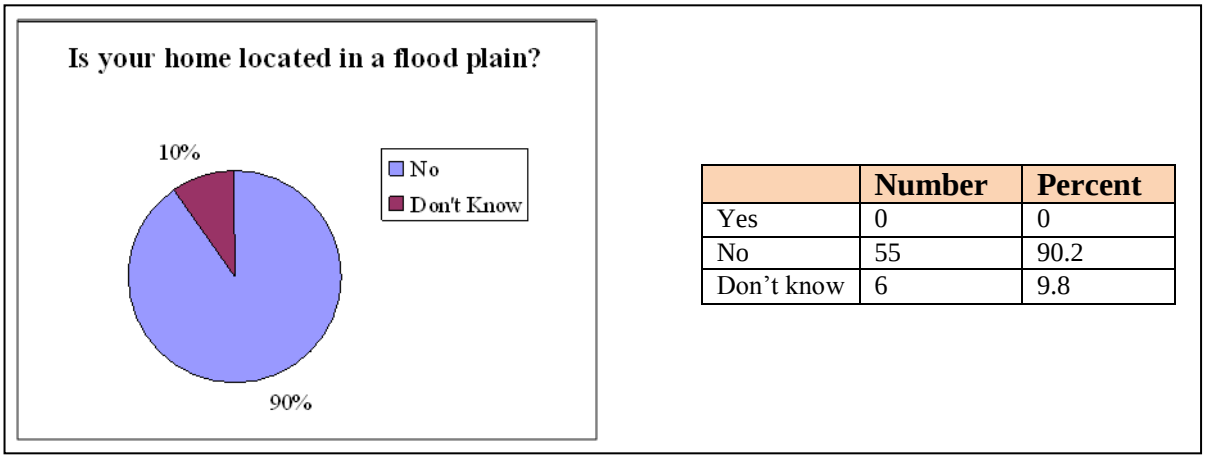
Air Quality as a hazard is linked to controversy in the area surrounding Confined Animal Feeding Operations (CAFOs). Infectious Diseases in this case represents West Nile Virus, a blood borne disease passed to humans from migratory birds by mosquitoes.

The five highest hazards (in terms of probability of occurrence) listed by the AHMP were:

1. Drought
2. Structure Fire
3. Severe Winter Storm
4. Thunderstorms, Hailstorms, Lightning, High Winds, Tornadoes
5. Wildland Fire

News coverage appears to have had an impact on the perceptions of the general public. Two prominent news issues, CAFOs and West Nile Virus were listed in the top five by the general public, while they were not listed at all by members of the AHMP Committee whose membership includes representatives of some of the organizations that are dealing with these important community issues.

Question 6:
Is your home located in a flood plain?

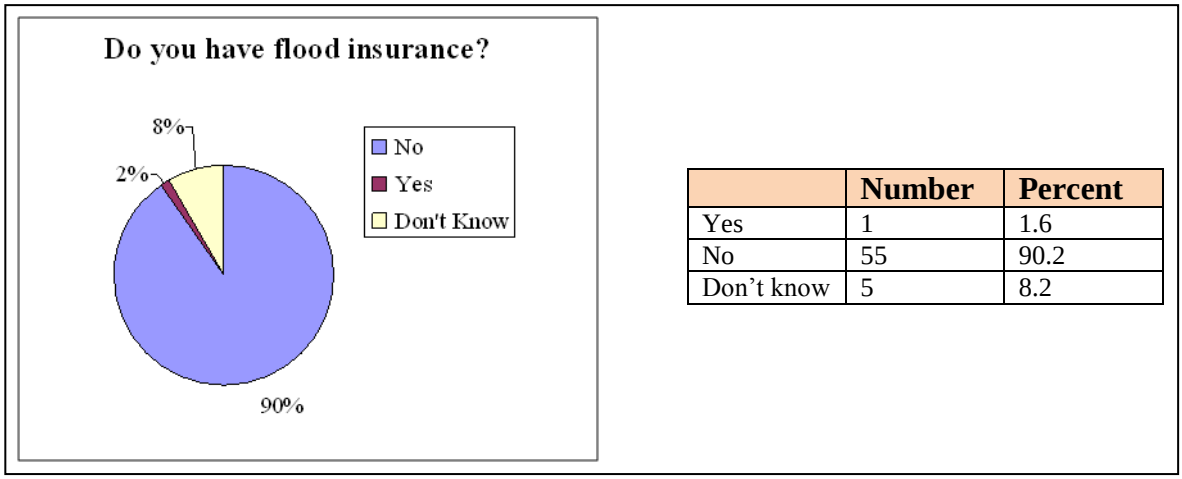


	Number	Percent
Yes	0	0
No	55	90.2
Don't know	6	9.8

Figure 3.4
Is your home located in a flood plain?

Very little of the County is located in the FEMA designated Flood Plain and none of the respondents indicated that they lived in a flood plain.

Question 7:
Do you have flood insurance?



	Number	Percent
Yes	1	1.6
No	55	90.2
Don't know	5	8.2

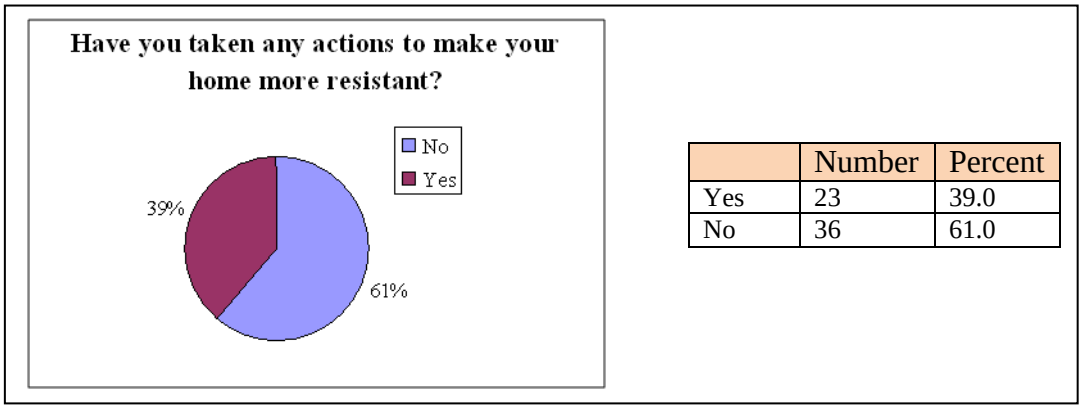
Figure 3.5
Do you have flood insurance?

If "no" why not?

	Number	Percent
Not located in a flood plain	40	69.0
Too expensive	2	3.4
Not necessary because it never floods	9	15.5
Not necessary because I'm elevated or protected	3	5.2
Never really considered it	4	6.9

Table 3.2
Reasons for not carrying flood insurance

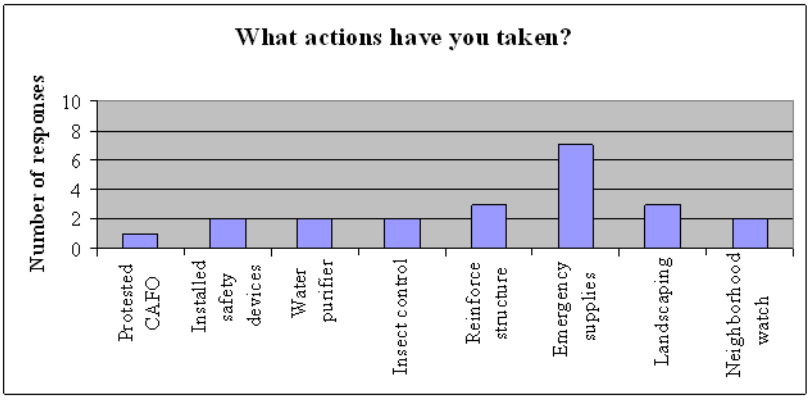
Question 8:
Have you taken any actions to make our home or neighborhood more resistant to hazards?



	Number	Percent
Yes	23	39.0
No	36	61.0

Figure 3.6
Have you taken actions to make your home or neighborhood more resistant to hazards?

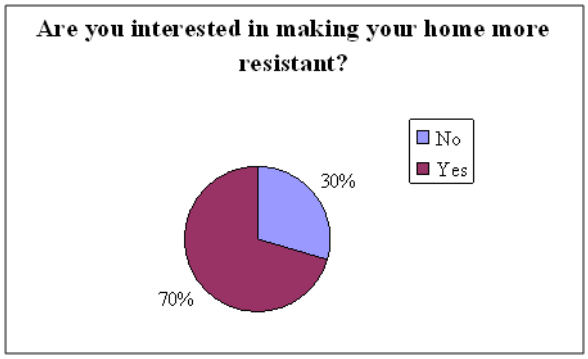
If "yes" explain (see below for exact responses).



Note that the highest response was the provision of emergency supplies. This may reflect the efforts of community volunteer and religious groups to urge families to have 72-hour emergency kits in their homes.

Figure 3.7
What actions have you taken to make your home more resistant to hazards?

Question 9:
Are you interested in making your home or neighborhood more resistant to hazards?



	Number	Percent
Yes	40	70.2
No	17	29.8

Figure 3.8
Are you interested in making your home more resistant?

This question is of particular importance because individual property owners may be asked to implement some of the mitigation actions called for in the Plan at their own expense.

Question 10:
What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards?

	Number
Newspaper	25
Television	22
Radio	8
Internet	3
Mail	28
Public Workshop/meeting	8

Table 3.3
What is the most effective way for you to receive information?

Published academic research done by Dr. Hank Jenkins-Smith, the Director of the University of New Mexico's Risk Perception Center and by Dr. Paul Solvic and a host of others[17] indicates that the public receives 72% of their information regarding risk through television. The respondents in this County, however, expressed a preference for receiving such information in printed form, either through the mail or through the newspaper, with television being listed in third place. This is a very important finding and one that was also obtained in neighboring Cassia County.

[17] Gregory, Robin, James Flynn, Paul Slovic, Technological Stigma, Risk, Media, and Stigma, Understanding the Public Challenges to Modern Science and Technology, Edited by James Flynn, Paul Slovic, and Howard Kunreuther, Earthscan, 1995, reprinted 2001, pages 3-8

Question 11:
In your opinion, what are some steps our county or city government could take to reduce or eliminate risk of future hazard damages in your neighborhood?

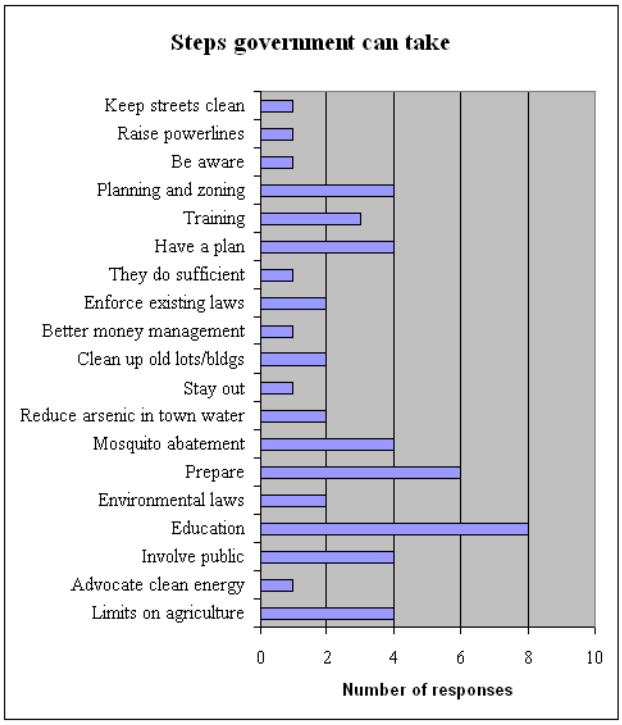


Figure 3.9
Steps government can take to reduce hazard damages

Public Education and Preparedness were among the actions that the respondents believe are the responsibility of County Government.

Related information on this and other questions can be found in Attachment 2 Public Questionnaire Results.

Question 14:
A number of community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories. Please tell us how important you think each one is for your community to consider pursuing.

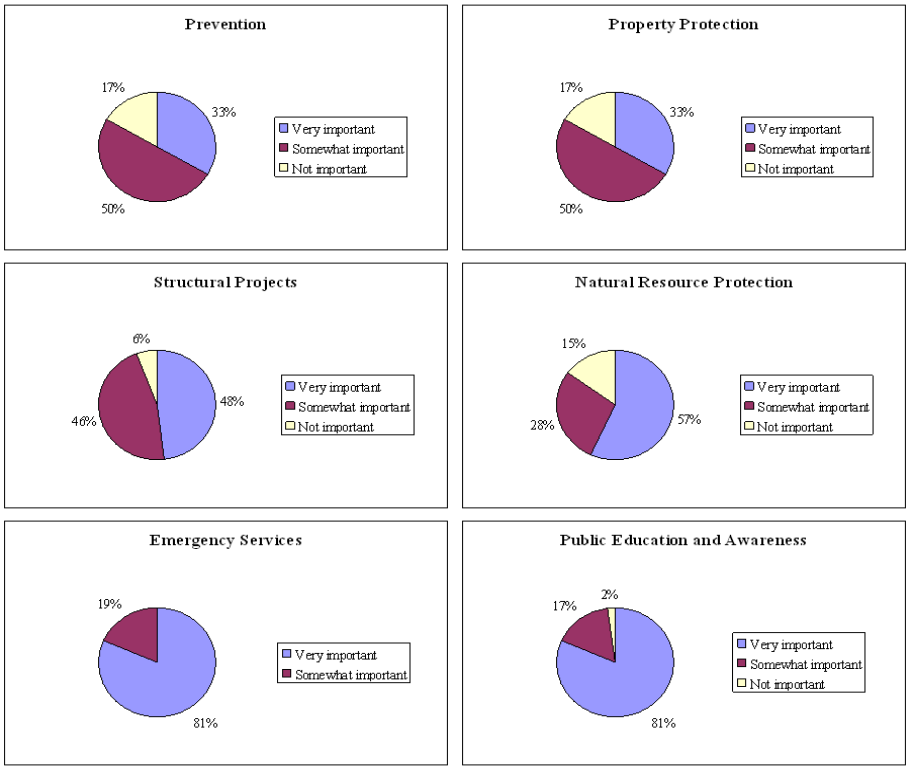


Figure 3.10
Community-wide activities that can reduce our risk from hazards

This final question in the survey helps to provide a basis for understanding public risk perception. As indicated in earlier questions, more than 70% of respondents indicated that they would like to make their community more resistant to disaster. The results of this final question, however, seem to indicate that the public's idea of how that protection needs to take place may not be aligned with this Plan's pre-disaster mitigation goals. The general public appears to believe mitigation can be accomplished through provision of emergency services and by public education/awareness. While both of these preparedness activities are critical to the overall emergency management program, truly effective mitigation requires a focus on prevention and protection. It will be necessary for the public to understand these concepts if the mitigation actions proposed in this plan are to be effectively implemented.

Public Meetings

Twin Falls County has a unique Local Emergency Planning Committee (LEPC) comprised of typical emergency response agencies plus members representing industry as well as the community at large. Several meetings were held with the Twin Falls County LEPC. The initial meeting included a briefing on the overall AHMP Process as well as several status reports given during subsequent meetings. Participants were asked to fill out the perception tool and were briefed on the Community AHMP Survey. The LEPC was also briefed specifically after the Community Survey was completed. The results were presented and the participants were again asked to fill out the perception tool, the results of which were presented above. There were occasions where the LEPC and the AHMP Committee meetings were held jointly to ensure that the LEPC was kept abreast of the progress of the AHMP.

The Twin Falls County Commissioners hosted a local community hazard mitigation workshop on April 29, 2008 at 6:00 pm at the County Planning and Zoning Meeting Room. The workshop, as scheduled was the culminating event of the County's All Hazard Mitigation Planning Project which began in the fall of 2006. Those invited to attend the workshop included the Commissioners, City Council members and Mayors of both Cities and representatives from other County and City Agencies. The public was also invited as were members of the City and County Planning and Zoning and Public Works Departments.

Whisper Mountain Professional Services, Inc., the County's Emergency Management Consultant, facilitated the workshop. Whisper Mountain presented the hazard profiles completed for the County along with potential impacts to County, city, and private property.

The attendance at the workshop was disappointingly limited to County elected and appointed officials with no attendance from the invited elected City officials or the general public. Effort will be put forth in the future to engage the elected officials from the Cities and the general public requesting them to endorse the Plan and to assist in the implementation and future updates.

A draft of the Twin Falls County All Hazard Mitigation Plan was posted on the Whisper Mountain website at http://www.whispermountain.net/TwinFallsCountyAHMPDraft.pdf for community review. Comments were provided and incorporated.

Press Release:

Twin Falls County Holds Local Community Hazard Mitigation Workshop

The Twin Falls County Commissioners will be hosting a local community hazard mitigation workshop on Wednesday April 30, 2008 at 6:00 pm at the Twin Falls County Planning and Zoning Meeting Room in Twin Falls. The workshop, as scheduled, will be the culminating event of the County's All Hazard Mitigation Planning Project which began in the fall of 2006. Expected attendees at the workshop include the commissioners, City Council members from Buhl, Castleford, Filer, Kimberly, Hansen, Murtaugh, Hollister, Rogerson, and Twin Falls, the Mayors of all of these Cities, representatives from Howe, and representatives from County and City Planning and Zoning, Road & Bridge, Public Works, and Community Development departments. The public is also invited to attend.

Whisper Mountain Professional Services, Inc., the County's Emergency Management Consultant, will be facilitating the workshop. Whisper Mountain will present the hazard profiles completed for the County along with potential impacts to county, city, and private property. Each jurisdiction will then be requested to identify goals and objectives to lessen impacts on the community from the risks posed by the hazards. The overall goal of hazard mitigation is to save lives and reduce property damage. Hazards identified in the County, such as earthquake, flood, and wildfire will be examined and goals established which when implemented will reduce the risk to the greater Butte County communities.

A draft of the Twin Falls All Hazard Mitigation Plan can be found on the Whisper Mountain website at:

http://www.whispermountain.net/TwinFallsCountyAHMPDraft.pdf.

Twin Falls County Local Mitigation Workshop Invitation

TOM MIKESELL
CHAIRMAN
SECOND DISTRICT

L. GEORGE URIE
VICE CHAIRMAN
THIRD DISTRICT

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BOARD OF COUNTY COMMISSIONERS
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TERRY KRAMER
COMMISSIONER
FIRST DISTRICT

KRISTINA GLASCOCK
CLERK
(208) 736-4004

March 31, 2008

Whisper Mountain Professional Services, Inc.
1110 Call Creek Drive, Suite 6
Pocatello, ID 83201

Whisper Mountain Professional Services, Inc. has been contracted by Twin Falls County to write the Twin Falls County Multi-Jurisdiction All Hazard Mitigation Plan. The purpose of this plan is to identify existing and potential risks in the County, and mitigate them pre-disaster in order to save lives and reduce property loss. Identifying these risks and listing them in the plan also qualifies the County to apply for additional financial help from the State in the event of a disaster. We would like to invite you to a meeting on April 30, 2008 at 6:00pm at the Twin Falls County Planning and Zoning Room, located at 2463 3rd Ave E, Twin Falls, Idaho, so we could have your input in order to identify and prioritize these risks.

Inasmuch as this is a multi-jurisdiction plan, it is essential to have you participate in this process. Your contribution is greatly valued and appreciated. We look forward to seeing you Wednesday, April 30th.

Sincerely,

Tom Mikesell
Chairman

Terry Kramer

George Urie

Twin Falls County is an Equal Opportunity Employer

Section 4 Risk Assessment

Hazard Definitions

Hazards that pose a threat to human life, health, and well-being are myriad and no attempt is made here to compile an exhaustive list. Those that are addressed in disaster planning are generally categorized as "natural" or "technological" (sometimes "man made"). The FEMA website[18] contains a thorough discussion of hazards in the section entitled "FEMA's Multi-Hazard Identification and Risk Assessment (MHIRA)"[19]. Some hazards are a threat to all geographic areas while others (e.g. Tsunami in coastal regions) are more limited in their extent. Studies were conducted to determine which hazards are of concern in Twin Falls County. Hazards that have been identified as significant in this County and that are considered in this Plan are:

Natural Hazards

- Weather: Drought
  - Extreme Heat
  - Extreme Cold
  - Severe Winter Storm
  - Lightning
  - Hail
  - Tornado
  - Straight Line Wind
- Flooding: Flash Flood
  - River Flooding
  - Dam Failure
- Geologic: Earthquake
  - Landslide/Mudslide
- Other: Wildfire
  - Biological
    - Pandemic/Epidemic
      - Bird Flu
      - SARs
      - West Nile

Technological (Manmade) Hazards

- Structural Fire
- Nuclear Event
- Hazardous Material Event
- Riot/Demonstration/Civil Disorder
- Terrorism

[18] http://www.fema.gov/index.shtm
[19] http://www.fema.gov/plan/prevent/fhm/ft_mhira.shtm

Section 4.1 Weather Hazards

The impact of weather hazards may be widespread (drought) or more localized (lightning), but all have the potential to be severe and directly life-threatening. Historical weather data is generally available in good detail over long time periods, allowing for reasonably accurate risk assessment for planning purposes.

Drought

Description

Drought is an expected phase in the climactic cycle of almost any geographical region. Certainly that is the case in the State of Idaho. Objective, quantitative definitions for drought exist but most authorities agree that, because of the many factors contributing to it and because its onset and relief are slow and indistinct, none is entirely satisfactory. According to the National Drought Mitigation Center, drought "originates from a deficiency of precipitation over an extended period of time, usually a season or more. This deficiency results in a water shortage for some activity, group, or environmental sector." What is clear is that a condition perceived as "drought" in a given location is the result of a significant decrease in water supply relative to what is "normal" in that area.

It should be noted that water supply is not only controlled by precipitation (amount, frequency, and intensity), but also by other factors including evaporation (which is increased by higher than normal heat and winds), transpiration (evaporation from foliage), and human use. According to the NOAA National Climactic Data Center, much of the State of Idaho most recently experienced moderate to extreme drought conditions from the years 2000 through 2005. Drought Emergency Declarations were issued for various counties by the Idaho Department of Water Resources in the years 2002 through 2005. Idaho's only Federal Drought Emergency Declaration was issued in 1977.

Drought risk is based on a combination of the frequency, severity, and spatial extent of drought (the physical nature of drought) and the degree to which a population or activity is vulnerable to the effects of drought. The degree of a region's vulnerability depends on the environmental and social characteristics of the region and is measured by their ability to anticipate, cope with, resist, and recover from drought. Society's vulnerability to drought is determined by a wide range of factors, both physical and social, such as demographic trends and geographic characteristics.

Figure 4.1.1 illustrates the precipitation conditions as compiled by the National Weather Service (NWS) for Twin Falls County during the years 1977 to the present using the Palmer Modified Drought Index. The Palmer Modified Drought Index (PMDI), first developed in 1965, is a means of quantifying drought in terms of moisture demands versus moisture supply. Moisture demands include plant requirements and water needed for recharge of soil moisture supplies. An allowance is also included for runoff amounts necessary for recharging both ground water and surface water supplies such as rivers, lakes, aquifers and reservoirs. The PMDI balances the moisture demands against the moisture supply available.

Approximate Cumulative Frequency %	Range PSDI	Category	Range
> 96	> 4.00	Extreme Wetness	> 3.50
90-95	3.00 – 3.99	Severe Wetness	2.50 – 3.49
73 – 89	1.50 – 2.99	Mild to Moderate Wetness	1.00 – 2.49
28 – 72	-1.49 – 1.49	Near Normal	-1.24 - .099
11 -27	-1.50 - -2.99	Mild to Moderate Drought	-1.25 - -1.99
5 – 10	-3.00 - -3.99	Severe Drought	-2.00 – 2.74
1 – < 4	< -4.00	Extreme Drought	< -2.75

Table 4.1.1
PMDI Classes for Wet and Dry Periods

The PMDI expresses this comparison of moisture demand to moisture supply on a numerical scale that usually ranges from positive six to negative six. Positive values reflect excess moisture supplies while negative values indicate moisture demands in excess of supplies.

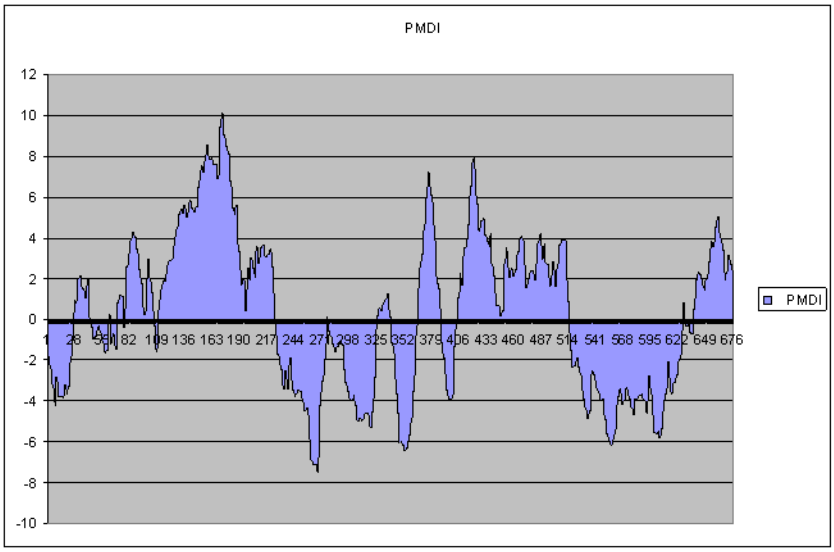


Figure 4.1.1
Palmer Modified Drought Index

Historical Frequencies

The Idaho Department of Water Resources reports that meteorological drought conditions existed in the state approximately 30% of the time during the period 1931-1982. The most prolonged drought in Idaho was during the 1930s. For most of the state, that drought lasted for 11 years (1929-41) despite greater than average stream flows in 1932 and 1938. A mild drought during 1959-61 occurred in southern and central Idaho. During the early 1960's, several areas in the state also experienced water shortages.

In 1977, the worst single year on record, a severe water shortage occurred throughout Idaho and the West. Area ski resorts were closed for much of the ski season. A lack of winter snowfall resulted in the lowest runoff of record at most gages in the state. Irrigation ditches were closed well before the end of the growing season and crop yields

were below normal. Domestic wells in the Big and Little Wood River basins became dry early in April 1977, and many shallow wells in six western Idaho counties became dry in June. Stream flows were below normal from 1979 to 1981. From 1987 through 1992, water supplies were much below normal throughout the state. In southwestern and central Idaho, this six year drought was more severe than the 1930s drought. Low winter snowpack and prolonged periods of greater than average temperatures resulted in unseasonable early snow melt, high water demands, and the lowest stream flows since 1977. In 1987, the water supply ranged from 10 to 50 percent below normal over many areas of the state (Idaho State Hazard Mitigation Plan, 2004) .

The historical analysis for Twin Falls County indicates that it is normal to expect periods of drought. Drought declarations were made in the following years:

- 1977
- 1979
- 2004
- 2005

There was also a drought event in 1919 that was blamed for several forest fires in Central Idaho.

Impacts

Drought is agriculture's most expensive, frequent, and widespread form of natural disaster. The current drought in the interior West is part of a multi-year drought that began in 1999, worsened in 2000, and has continued, with some interruptions thus far into 2008. As a result, the drought in the West was slow to develop, and likewise, will be slow to recede.

Drought produces a complex web of impacts that spans many sectors of the economy and reaches well beyond the area experiencing physical drought. This complexity exists because water is integral to our ability to produce goods and provide services.

Impacts are commonly referred to as direct or indirect. Reduced crop, rangeland, and forest productivity; increased fire hazard; reduced water levels; increased livestock and wildlife mortality rates; and damage to wildlife and fish habitat are a few examples of direct impacts. The consequences of these impacts illustrate indirect impacts. For example, a reduction in crop, rangeland, and forest productivity may result in reduced income for farmers and agribusiness, increased prices for food and timber, unemployment, reduced tax revenues because of reduced expenditures, increased crime, foreclosures on bank loans to farmers and businesses, migration, and disaster relief programs. Direct or primary impacts are usually biophysical. Conceptually speaking, the more removed the impact from the cause, the more complex the link to the cause. In fact, the web of impacts becomes so diffuse that it is very difficult to come up with financial estimates of damages. The impacts of drought can be categorized as economic, environmental, or social.

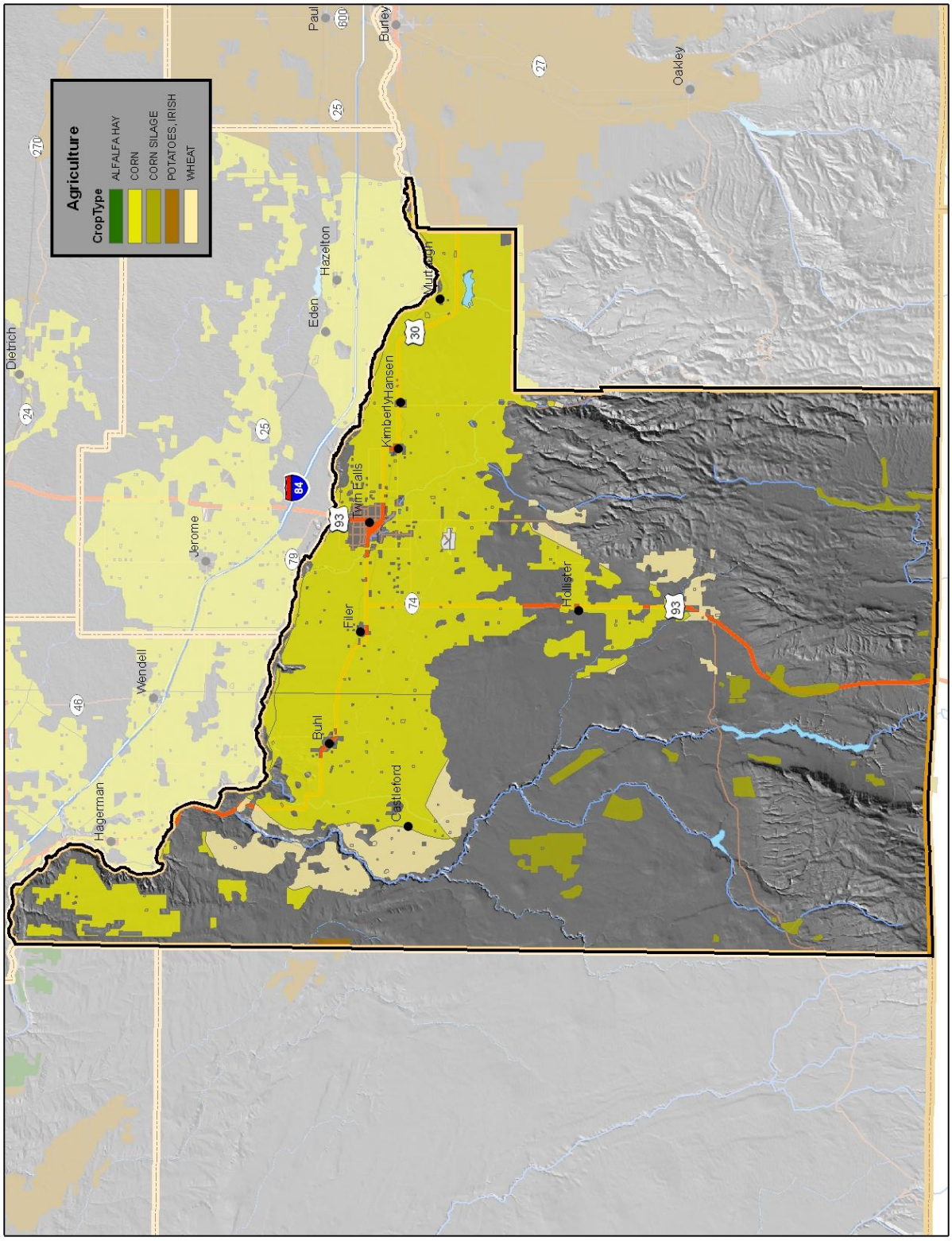


Figure 4.1.2
Twin Falls County Agricultural Lands Map

Many economic impacts occur in agricultural and related sectors because of the reliance of these sectors on surface and subsurface water supplies. In addition to obvious losses in yields in crop and livestock production, drought is associated with increases in insect infestations, plant disease, and wind erosion. Droughts also bring increased problems with insects and diseases to forests and reduce growth. The incidence of forest and range fires increases substantially during extended droughts, which in turn places both human and wildlife populations at higher levels of risk.

Loss Estimates

Income loss is another indicator used in assessing the impacts of drought because so many sectors are affected. Reduced income for farmers has a ripple effect. Retailers and others who provide goods and services to farmers face reduced business. This leads to unemployment, increased credit risk for financial institutions, capital shortfalls, and loss of tax revenue for local, State, and Federal government. Less discretionary income affects the recreation and tourism industries. Prices for food, energy, and other products increase as supplies are reduced. In some cases, local shortages of certain goods result in the need to import these goods from outside the stricken region. Reduced water supply impairs the navigability of rivers. Hydropower production may also be curtailed significantly.

The charts in figures 4.1.3 and 4.1.4 illustrate the net income for both individual as well as corporate farms in Twin Falls County from 1970 through 2006. Note the income drops during the late 1970's, two times when Twin Falls County declared a Drought Disaster. The income also drops during the drought years beginning in 1999.

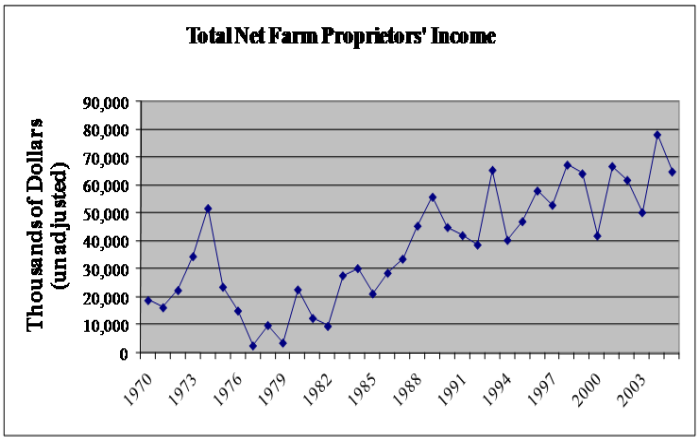


Figure 4.1.3
Total Net Farm

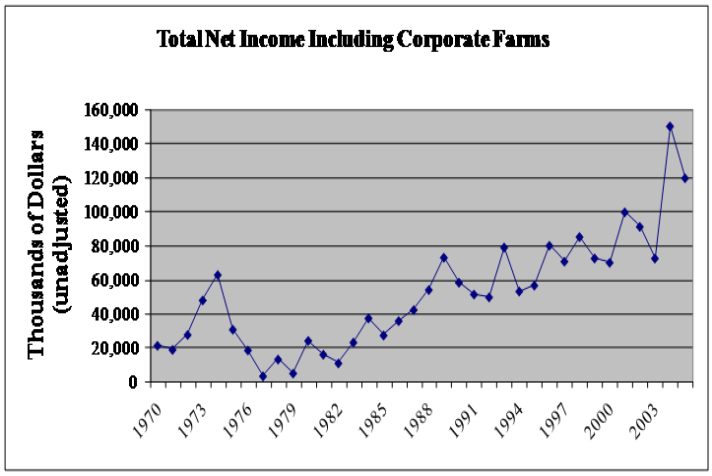


Figure 4.1.4
Total Net Income Including

Environmental losses are the result of damages to plant and animal species, wildlife habitat, and air and water quality, forest and range fires, degradation of landscape quality, loss of biodiversity, and soil erosion. Some of the effects are short-term and conditions quickly return to normal following the end of the drought. Other environmental effects linger for some time or may even become permanent. Wildlife habitat, for example, may be degraded

through the loss of wetlands, lakes, and vegetation. However, many species will eventually recover from this temporary aberration. The degradation of landscape quality, including increased soil erosion, may lead to a more permanent loss of biological productivity of the landscape. Although environmental losses are difficult to quantify, growing public awareness and concern for environmental quality has forced public officials to focus greater attention and resources on these effects.
Social impacts mainly involve public safety, health, conflicts between water users, reduced quality of life, and inequalities in the distribution of impacts and disaster relief. Many of the impacts specified as economic and environmental have social components as well.

Hazard Evalution

Drought and the related impacts are of serious concern to Twin Falls County. Over 97% of the County land is used for agricultural uses including tillage and rangeland. The impacts due to drought in Twin Falls County are potentially significant especially if the drought were to be protracted. While it is impossible to stop the occurrence of drought the impacts can be mitigated through proper planning and management of water resources.

Drought risk is based on a combination of the frequency, severity, and spatial extent of drought (the physical nature of drought) and the degree to which a population or activity is vulnerable to the effects of drought. The degree of a region's vulnerability depends on the environmental and social characteristics of the region and is measured by their ability to anticipate, cope with, resist, and recover from drought. Society's vulnerability to drought is determined by a wide range of factors, both physical and social, such as demographic trends and geographic characteristics. Although the economy in Twin Falls County is diverse, it contains extensive agriculture ventures that can be adversely affected by drought conditions.

Repetitive Loss

Drought has occurs in cycles on the high desert plains of Idaho. The losses are significant and repetitive.

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Drought has a magnitude score of 18

Magnitude/Frequency Scoring Rationale

By its nature, drought develops slowly (Warning Lead Times = 1), and affects wide geographical areas (Geography Affected = 8) but is the direct cause of little or no death or injury (Bodily Harm = 1). Because agriculture is a large component of Twin Falls County's economy, major economic loss could be sustained (Economic Loss = 4). In practice, drought recovery is generally managed at the State level (Reconstruction Assistance = 4). The total Magnitude score is, therefore, eighteen (18) which, for Twin Falls County, is in the "High" range. Historical records for drought are available and reliable, indicating that drought occurs in the approximately once every five years in Twin Falls County (Frequency = High).

Extreme Heat

Description

The term "extreme heat," sometimes called "heat wave," is to some extent a relative one describing a period when weather conditions include temperatures and humidity significantly higher than those usual for a particular geographic area. The National Weather Service (NWS) issues alerts to the public based on its Heat Index which takes both temperature and humidity into account (see Figure 4.1.5). The NWS will initiate alert procedures when the HI is expected to exceed 105°- 110°F (depending on local climate) for at least two consecutive days. The effects of extreme heat are often exacerbated in large urban areas due to the heat island effect and because stagnant atmospheric conditions may trap pollutants. Extreme heat conditions are not common to Idaho where, in general, humidity is low and weather patterns variable.[20]

NOAA's National Weather Service Heat Index

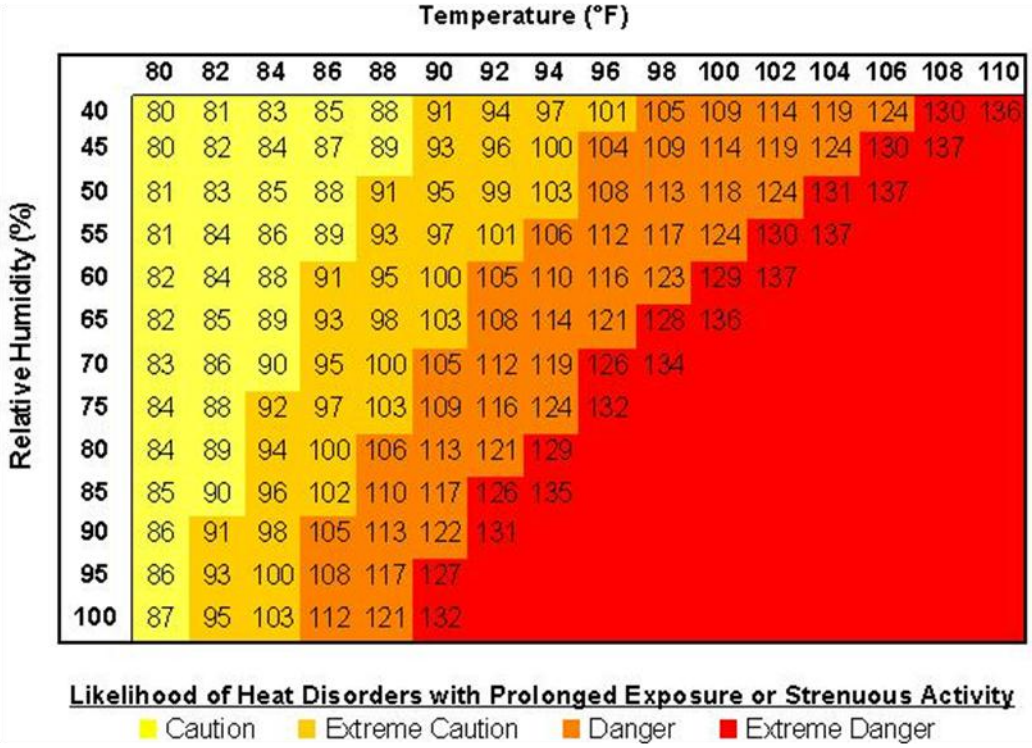


Figure 4.1.5
National Weather Service Heat Index Chart
http://www.nws.noaa.gov/om/heat/index.shtml)

[20] http://www.nws.noaa.gov/om/brochures/heat_wave.shtml

Historical Frequencies

The record high for Twin Falls County is 110 degrees F in the City of Twin Falls on July 10, 2003. The record high for Castleford is 105 degrees F which occurred on July 14, 1978. The record high temperature for the Buhl was 106 degrees F occurring on July 24, 2003. The following charts show the extreme maximum and minimum temperatures for Twin Falls, Castleford and Buhl, Idaho.

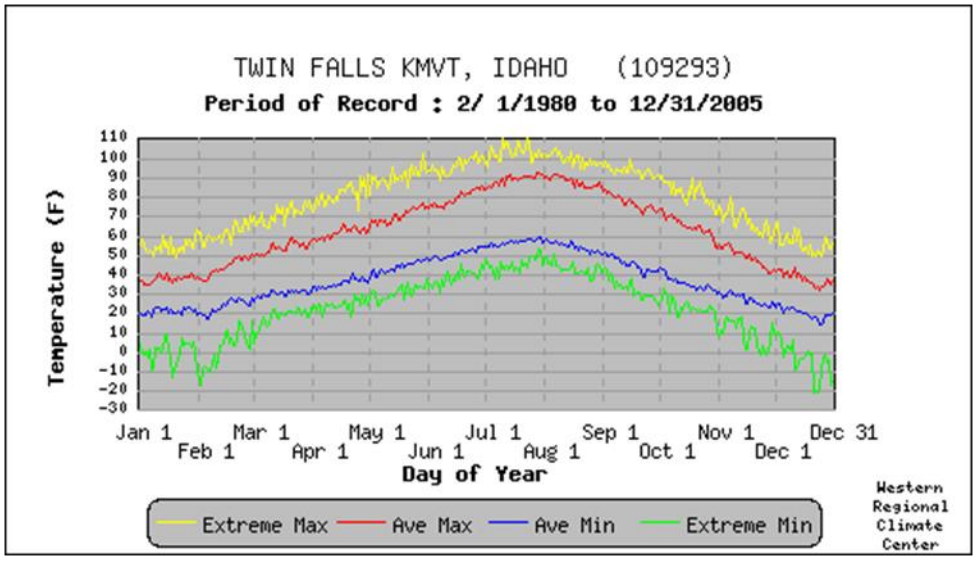


Figure 4.1.6
Extreme Maximum and Minimum Temperatures for Twin Falls, Idaho
Source: http://www.wrcc.dri.edu/summary/Climsmsid.html

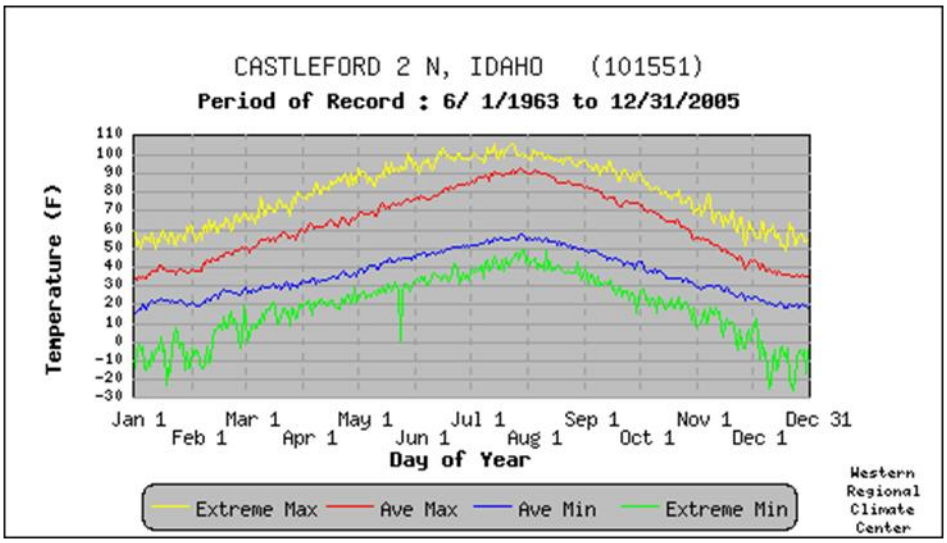


Figure 4.1.7
Maximum and Minimum Temperatures for Castleford, Idaho
Source: http://www.wrcc.dri.edu/summary/Climsmsid.html

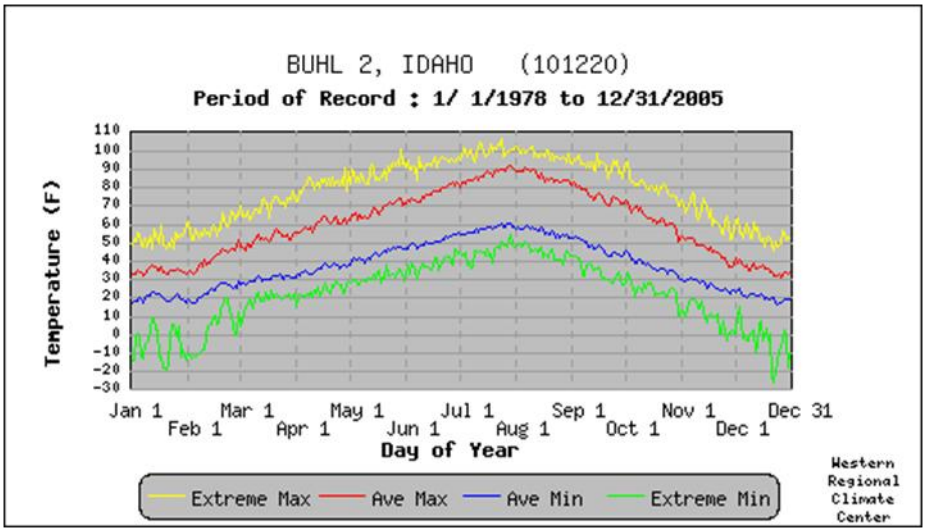


Figure 4.1.8
Maximum and Minimum Temperatures for Buhl, Idaho
Source: http://www.wrcc.dri.edu/summary/Climsmsid.html

Impacts

The primary impact of extreme heat is on human health causing such disorders as sunstroke, heat exhaustion, and heat cramps. Particularly susceptible are the elderly, small children, and persons with chronic illnesses. There are also undoubtedly indirect and chronic health effects from extreme heat the magnitude of which are difficult or impossible to estimate. Environmental effects can include loss of wildlife and vegetation and increased probability of wildfires.

Loss Estimates

Extreme heat places high demands on electrical power supplies that can lead to blackouts or brownouts. Economic impacts result from such factors as increased energy prices, loss of business as people avoid leaving their homes to avoid the heat, and agricultural losses. The magnitude of these and other, more indirect impacts is, again, difficult to assess but for severe heat waves have been estimated to be in the billions to hundreds of billions of dollars.

Hazard Evaluation

Repetitive Loss - none

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

Extreme Heat has a magnitude score of 10

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Magnitude/Frequency Scoring Rationale

Warning times for extreme heat are subject to the limitations of short-term weather forecasting (Warning Lead Times = 2). The geographical areas affected are somewhat limited (Geography Affected = 4) and while deaths may occur, the number of deaths is generally minimal (Bodily Harm = 2). Because the duration of extreme heat events is usually only a few days, agriculture is seldom significantly affected and economic loss is usually small (Economic Loss = 1). Because extreme heat usually affects a few, scattered individuals, assistance is seldom required or available from governmental entities (Reconstruction Assistance = 1). The total Magnitude score is, therefore, ten (10) which, for Twin Falls County, is in the "Low" range. Historical records for extreme heat are available and reliable, indicating that there has been extreme heat event has occurred in Twin Falls County within the last five (5) years. (Frequency = High).

Extreme Cold

Description

"Extreme cold" is another of the terms describing hazards that must be defined relative to what is considered normal in a given locale. What might be considered extreme cold varies considerably in the State of Idaho where normal winter temperatures in the southwest are appreciably more moderate than those in the northwest and far north. Very cold temperatures become a particular hazard when accompanied by winds of 10 mph or greater. The NWS has developed a formula for calculating "wind chill" based on temperature and wind speed (see Figure 4.1.9) and in this region issues wind chill advisories when the wind chill temperature are predicted to be -10°F or less with winds of 10 mph or higher for one hour or more. Wind chill warnings are issued when wind chill temperature will be -20°F or less with winds of 10 mph or higher for one hour or more. As with extreme heat, extreme cold is of greatest concern when the condition persists for an extended period of time.

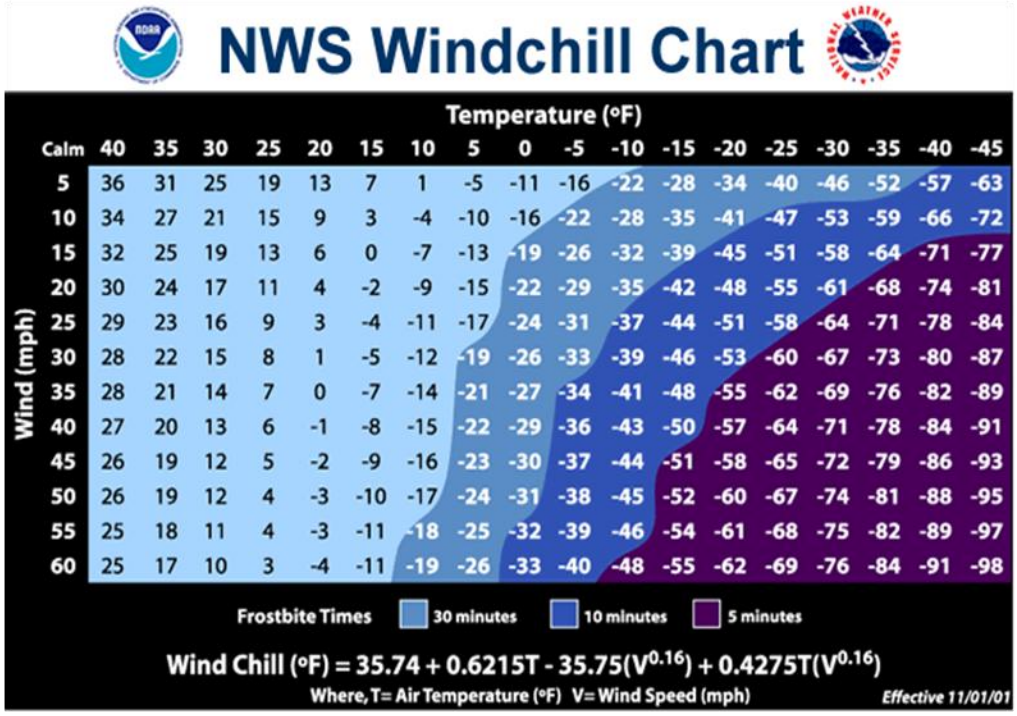


Figure 4.1.9
National Weather Service Windchill Chart
http://www.weather.gov/om/windchill/index.shtml

Historical Frequencies

The record low temperature in Twin Falls County is -27 degrees F occurring in Hollister on December 22, 1990. The record for Castleford is -26 degrees F which occurred on December 22, 1990 and in Buhl on December 22, 1990. The record low temperature in the City of Twin Falls is -21 degrees F which occurred on December 21, 1990.

Impacts

Health effects of exposure to extreme cold include hypothermia and frostbite, both of which can be life-threatening. Infants and the elderly are most susceptible. In the United States, nearly 700 deaths are directly attributed to hypothermia annually.

Loss Estimates

Extreme cold may cause loss of wildlife and vegetation and kill livestock and other domestic animals. Economic loss may result from flooding due to burst pipes, large demands on energy resources, and diminished business activity. River flooding may take place as a result of the formation of ice jams.

Hazard Evaluation

Extreme cold affects the individual, families, cities, and the County. Damage typically occurs to individual properties; however, city water systems are usually vulnerable to extreme cold. Repairs to water line freeze ups and breaks typically require the roadways to be excavated necessitating additional maintenance and repairs during the warmer months. As demonstrated in the historical frequency section, areas of the County can expect as much as 20-25 degrees difference depending on elevation.

Extreme Cold can cause death and injury especially to those working or stranded outside for prolonged periods. Economic loss is related to private individuals, businesses, and government agencies in heating of homes and facilities. Additional losses can be expected to the livestock industry. During extreme cold periods the schools are closed to protect children traveling to and from school.

During the spring, summer and fall, temperatures can drop low enough to produce frost. While such temperatures are not low enough to damage infrastructure or require extra heating costs, it can be devastating to crops. Figure 4.1.7 and Figure 4.1.8 show extreme minimum temperatures recorded at Castleford and Buhl. Extreme minimum temperatures can fall below freezing much of the spring, summer and fall.

Warning lead times in Twin Falls County usually are a day or two based on forecasts made by the National Weather Service in Boise.

Repetitive Loss - none

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

Extreme Cold has a magnitude score of 11

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Magnitude/Frequency Scoring Rationale

Warning times for extreme cold are subject to the limitations of short-range weather forecasting (Warning Lead Times = 2). The geographical areas affected are generally limited to a few sections (Geography Affected = 4). Because very cold weather is fairly common during the winter in rural Twin Falls County, citizens are prepared and deaths due to extreme cold are improbable (Bodily Harm = 1). The duration of extreme cold events is generally a few days, but some economic effects, particularly on agriculture, might be expected depending on seasonal considerations (Economic Loss = 2). The extent and severity of extreme cold is generally quite limited to individual resources (Reconstruction Assistance = 1). The total Magnitude score is, therefore, eleven (11) which, for Twin Falls County, is in the "Low" range. Historical records for extreme cold are available and reliable, and indicate that extreme cold events occur in Twin Falls County in the five to twenty-five year range (Frequency = Medium).

Severe Winter Storm

Description

The NWS describes "Winter Storm" as weather conditions that produce heavy snow or significant ice accumulations. For purposes of this analysis Severe Winter Storm is defined as any winter condition where the potential exists for a blizzard (winds ≥ 35mph and falling/drifting snow frequently reduce visibility < ¼ mile, for 2 hrs or more) heavy snowfall (valleys 6 inches or more snowfall in 24 hrs mountains 9 inches or more snowfall in 24 hrs), ice storm, and/or strong winds.

Historical Frequencies

Place	Date	Magnitude/details
Twin Falls County	Jan 15, 1915	Heavy rain that turned to sleet/snow with winds > 50 mph. Power outages.
Twin Falls County	Mar 1, 1917	Winter storm that resulted in several bad snow slides. One of the snow slides inflicted severe injuries on a resident
Twin Falls County	Jan 20, 1930	Winter storm that lasted a few days. Roads closed because of drifting snow.
Murtaugh	Feb 8, 1949	Freezing temps, one fatality
Twin Falls County	Jan 8, 1969	Blizzard with winds over 50 mph. Power failures, highway and airport closures.
Twin Falls County	Jan 22, 1999	Winter storm with heavy snow throughout southeast Idaho, 3-5 inches fell in Southern Twin Falls County
Twin Falls County	Feb 9, 1999	Freezing rain, light snow and gusty winds produced hazardous driving conditions in Southern Twin Falls County. About 30 minor accidents and slide offs occurred and authorities had to close I-84 for a few hours.
Twin Falls County	Dec 1, 1999	Winter Storm moving from the North Pacific across Oregon brought 3-4 inches of snow to Southern Twin Falls County
Twin Falls County	Jan 20, 2002	Winter Storm with 3-6 inches of snow in Southern Twin Falls County
Twin Falls County	Dec 28-29, 2003	A major winter storm through southwest Idaho with 6-12 inches of new snow. Strong winds caused blowing and drifting.
Twin Falls County	Feb 26, 2004	Winter storm moving north from Nevada brought 7 inches of snow to Southern Twin Falls County.
Twin Falls County	Jan 8, 2005	11 inches of snow fell on Southern Twin Falls County. The trailing cold front caused strong winds along the Snake River.
Twin Falls County	April 20, 2005	8-12 inches of snow fell behind a cold front
Twin Falls County	Dec 20, 2005	Winter storm with heavy snow
Twin Falls County	Dec 21, 2006	Winter storm with heavy snow
Twin Falls County	Feb 27, 2007	Winter storm with 4-5 inches of snow in Southern Twin Falls County
Twin Falls County	Mar 27, 2007	Winter storm

Table 4.1.2
Twin Falls County Historical Winter Storm Events

Severe winter weather in Twin Falls County is infrequent but weather conditions can be extremely hazardous in the outlying areas due to blowing and drifting snow. Records for

snow fall shown in Table 4.1.2 are not indicative of the hazardous conditions that exist during a blizzard condition. While snow levels are usually not extreme, blizzard conditions – snow, high winds, and freezing temperatures – are not infrequent in Twin Falls County and can be extremely hazardous.

Impacts

The impacts of the very cold temperatures that may accompany a severe winter storm are discussed above. Other life threatening impacts are numerous. Motorists may be stranded by road closures or may be trapped in their automobiles in heavy snow and/or low visibility conditions. Bad road conditions cause automobiles to go out of control. People can be trapped in homes or buildings for long periods of time without food, heat and utilities. Those who are ill may be deprived of medical care by being stranded or through loss of utilities and lack of personnel at care facilities. Use of heaters in automobiles and buildings by those who are stranded may result in fires or carbon monoxide poisoning. Fires during winter storm conditions are a particular hazard because fire service response is hindered or prevented by road conditions and because water supplies may be frozen. Disaster Services may also not be available if telephone service is lost. People who attempt to walk to safety through winter storm conditions often become disoriented and lost. Downed power lines not only deprive the community of electricity for heat and light, but pose an electrocution hazard. Death and injury may also occur if heavy snow accumulation causes roofs to collapse. Fatalities in Idaho due to winter storms are somewhat unusual with ten being reported during the ten year period from 1995 through 2004.

Loss Estimates

Economic impacts arise from numerous sources including: hindered transportation of goods and services, flooding due to burst water pipes, forced closing of businesses, inability of employees to reach the workplace, damage to homes and structures, automobiles and other belongings by downed trees and branches, loss of livestock and vegetation and many others.

Hazard Evaluation

Repetitive Loss - none

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

Severe Winter Storm has a magnitude score of 16

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Magnitude/Frequency Scoring Rationale

Conditions leading winter storms may arise quickly, but usually have at least one day of warning (Warning Lead Times =2). Typically in Twin Falls County the entire County is vulnerable to winter storms (Geography Affected = 8) however, deaths and major injuries are unlikely (Bodily Harm = 2). The duration of a winter storm is generally a few days or less however, losses and business interruptions are possible (Economic Loss = 2). Winter storms can, in some cases, require somewhat extensive recovery and reconstruction requiring County resources (Reconstruction Assistance = 2). The total Magnitude score is, therefore, sixteen (16) which, for Twin Falls County, is in the "Medium" range. Historical records for winter storms are available and reliable, indicating that they occur at least once in five years in Twin Falls County (Frequency = High.

Lightning

Description

Lightning is defined by the NWS as follows: "A visible electrical discharge produced by a thunderstorm. The discharge may occur within or between clouds, between the cloud and air, between a cloud and the ground or between the ground and a cloud." A lightning discharge may be over five miles in length, generate temperatures upwards of 50,000^{o}F, and carry 50,000 volts of electrical potential. Lightning is most often associated with thunderstorm clouds but lightning can strike as far as five to ten miles from a storm. Thunder is caused by the rapid expansion of air heated by a lightning strike. Cloud-to-ground lightning strikes occur with much less frequency in the northwestern U.S. than in other parts of the country.

Historical Frequencies

Place	Date	Time	Event	Magnitude/details
Hollister	May 23, 1911	unk	Lightning	One fatality
Filer	June 4, 1913	unk	Lightning	Struck a house, one fatality
Twin Falls County	July 22, 1913	unk	Lightning	One fatality, destroyed haystacks and killed several horses
Twin Falls County	June 18, 1918	unk	Lightning	Struck a house, no fatalities
Twin Falls County	July 23, 1923	unk	Lightning	Struck a home and burned to ground
Rogerson	July 29, 1942	Unk	Lightning	Started fire
Buhl	July 30, 1946	unk	Lightning	Power outages, struck and killed 7 cows
Twin Falls County	May 19, 1962	unk	Lightning	Struck irrigation pump

Table 4.1.3
Twin Falls County Historical Lightning Events

Between the years 1983 and 2002 lightning started 118 fires in Twin Falls County.

Weather data indicates that lightning occurs fairly frequently in Twin Falls County although strikes affecting the public are relatively rare. As can be seen in Table 4.1.3, however, there have been fatalities and property loss in the County due to lightning and the potential for such events is always present during thunderstorms.

Impacts

Lightning is the second most deadly weather phenomenon in the U.S., being second only to floods. On average, sixty to seventy deaths per year are attributed to lightning nationally. In Idaho the average is less than one per year. Despite the enormous energy carried by lightning, only about 10% of strikes are fatal. Injuries include central nervous system damage, burns, cardiac effects, hearing loss, and trauma. The effects of central nervous system injures tend to be long-lasting and severe, leading to such disorders as depression, alcoholism, and chronic fatigue and in some cases to suicide. Lightning also strikes structures causing fires and damaging electrical equipment. Wildland fires are often initiated by lightning strikes as are petroleum storage tank fires. About one third of all power outages are lightning-related.

Loss Estimates

The magnitude of economic losses is difficult to estimate. Government figures suggest annual national costs at around $30 million but some researchers find evidence that losses may be in the billions of dollars.

Hazard Evaluation

Lighting strikes occur with some regularity in Twin Falls County. Of special concern are the wide open fields and metal farm equipment. Several of the fatal lighting strikes happened while the individual was working in a field.

Repetitive Loss - none

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

Lightning has a magnitude score of 12.

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Magnitude/Frequency Scoring Rationale

Conditions leading lightning may arise quickly and unpredictably with little or no warning (Warning Lead Times =8). Lightning strikes are highly localized in Twin Falls County (Geography Affected = 1) and fatalities and injuries are rare (Bodily Harm = 1). Economic loss due to lightning is usually limited to a single structure (Economic Loss = 1) and government resources are not available for reconstruction (Reconstruction Assistance = 1). The total Magnitude score is, therefore, twelve (12) which, for Twin Falls County, is in the

"Medium" range. Historical records for lightning strikes are available and reliable, indicating that lightning events occur relatively frequently in Twin Falls County (Frequency = High).

Hail

Description

The NWS definition of "hail" is: Showery precipitation in the form of irregular pellets or balls of ice more than 5 mm in diameter, falling from a cumulonimbus cloud. Its size can vary from the defined minimum, a little over a quarter of an inch, up to 4.5 inches or larger. "Severe hail" is defined as being 0.75 inches or more in diameter. The largest hailstones are formed in supercell thunderstorms because of their sustained updrafts and long duration. Hail and severe hail are relatively uncommon in Idaho. In the ten year period from 1986 to 1995 the national weather service recorded severe hail in Idaho on 113 occasions while in the same time period severe hail was recorded in Colorado nearly 1,400 times.[21]

Historical Frequencies

Place	Date	Time	Event	Magnitude	Reported Damage
Twin Falls County	6/20/1963	8:00 PM	Hail	1.50 in.	unk
Twin Falls County	6/15/1967	6:00 PM	Hail	unk	unk
Twin Falls County	6/21/1967	8:00 PM	Hail	0.75 in.	unk
Twin Falls County	7/21/1970	5:00 PM	Hail	2.00 in.	unk
Twin Falls County	8/14/1979	1:30 PM	Hail	1.75 in.	unk
Twin Falls County	8/14/1979	3:00 PM	Hail	1.00 in.	unk
Twin Falls County	6/14/1984	5:45 PM	Hail	0.75 in.	unk
Twin Falls County	7/14/1985	7:30 PM	Hail	1.75 in.	unk
Twin Falls County	4/30/1987	2:30 PM	Hail	1.00 in.	unk
Twin Falls County	8/4/1991	3:30 PM	Hail	0.75 in.	unk
Twin Falls City	3/17/1993	6;15 PM	Hail	0.75 in.	unk
Twin Falls County	10/11/1994	5:30 PM	Hail	unk	unk
Rogerson	6/13/1996	2:00 PM	Hail	1.00 in.	unk
Murtaugh	6/13/1996	3:00 PM	Hail	0.75 in.	unk
Rogerson	6/27/1996	8:30 PM	Hail	0.75 in.	unk
Kimberly	5/31/1997	2:35 PM	Hail	0.75 in.	unk
Twin Falls Airport	8/7/1997	6:30 PM	Hail	0.75 in.	unk
Hollister	8/12/1997	2:30 PM	Hail	0.75 in.	unk
Rogerson	9/6/1997	2:25 PM	Hail	1.25 in.	unk
City of Buhl	5/16/1998	1:25 PM	Hail	0.75 in.	unk
Twin Falls City	6/25/1998	3:20 PM	Hail	1.00 in.	unk
Twin Falls City	8/9/1998	2:40 PM	Hail	0.88 in.	unk
Hollister	6/29/2004	2:55 PM	Hail	1.00 in.	unk

[21] http://www.ems.psu.edu/~nese/ch9web.htm

Place	Date	Time	Event	Magnitude	Reported Damage
City of Buhl	5/5/2005	5:05 PM	Hail	0.75 in.	$5,000
Rogerson	5/29/2005	1:20 PM	Hail	0.75 in.	$3,000
Twin Falls City	6/25/2005	2:35 PM	Hail	0.75 in.	unk
Hollister	6/8/2006	11:35 AM	Hail	0.88 in.	unk
Twin Falls City	7/6/2006	2:45 PM	Hail	0.88 in.	unk

Table 4.1.4
Reported Hails Storm Events with Damage

In any given year there is a 62% chance that a severe hail event will occur that will cause damage either to personal property or agricultural crops. From 1963 to 2005 there were 26 recorded damage-causing hail storm events. Damage ranged from broken windows to destroyed crops with the most costly damages being to crops. In May of 2005, two hail events caused $8,000 worth of damage (see Table 4.1.4) On June 20, 1963 a hailstorm destroyed nearly $4 Million in crops over three counties: Jerome, Twin Falls, and Cassia. Another hailstorm was reported on July 21, 1970. This storm focused on the Rogerson area and "completely destroyed all of the crops."[22]

As shown in Figure 4.1.10, hail events occur most frequently in the northern portion of the County, in the Snake River plain crossing the Magic Valley. Storms also follow the U.S. Highway 93 corridor down the center of the County into Nevada. The Magic Valley is the most populous area in the County and the County's major agricultural lands lie along the Snake River Plain and south across the central part of the County. Thus, both the population and the agricultural centers of Twin Falls County fall within the area most susceptible to major hail storms.

Impacts

Deaths and injuries due to hail have occurred but are rare.

Loss Estimates

Economic loss can be extensive, especially to agricultural based economies. Hail is very damaging to crops. Severe hail may cause extensive property damage including damage to vehicle paint and bodywork, glass, shingles and roofs, plastic surfaces, etc. Hail loss nationally is estimated at over one billion dollars annually. Twin Falls County has only had two incidents where monetary losses were reported totaling $8,000.

[22] http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

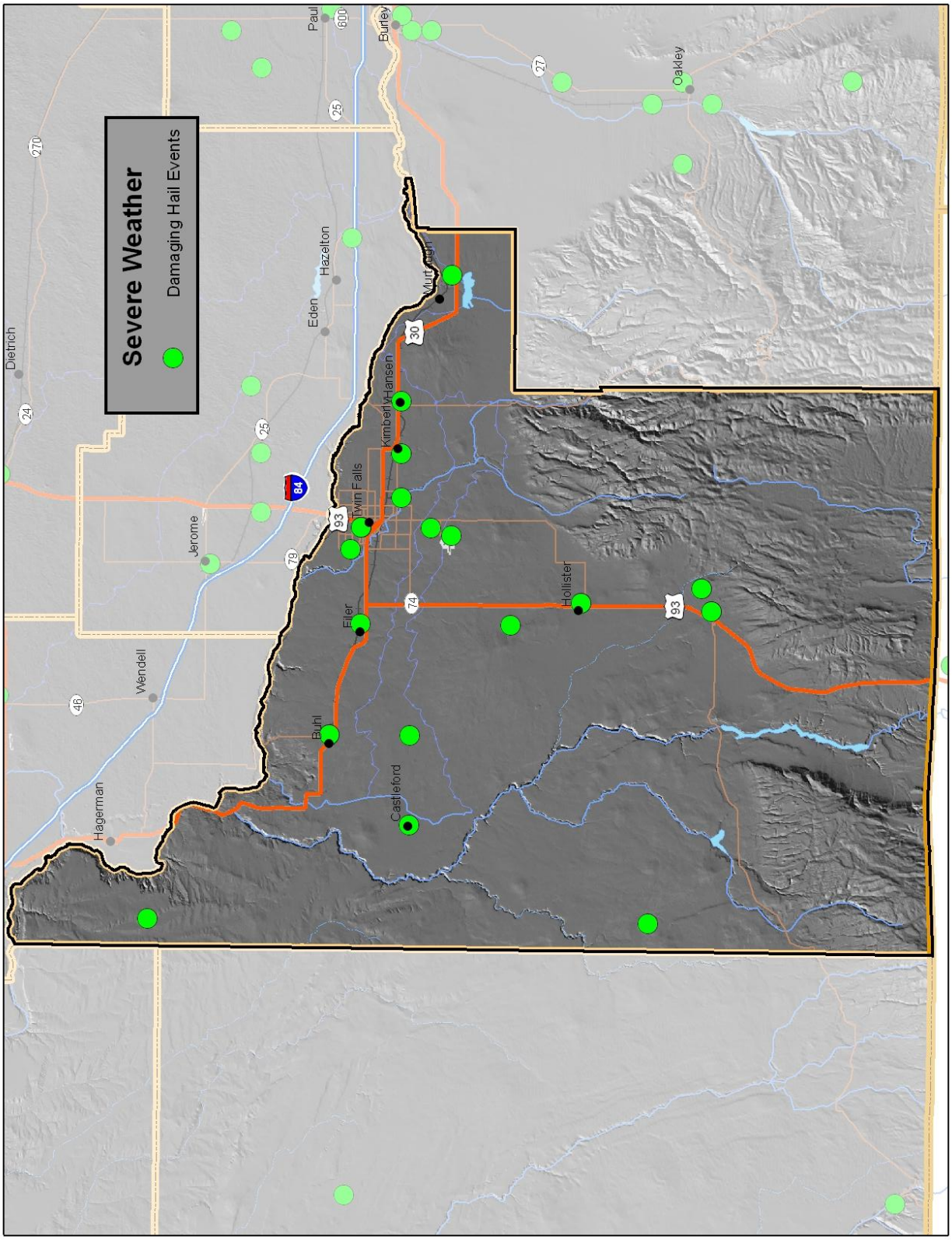


Figure 4.1.10
Twin Falls County Historic Hail Events Map

Hazard Evaluation

Repetitive Loss - none

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering / Economy Destroyed	Minutes

Hail has a magnitude score of 14

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Magnitude/Frequency Scoring Rationale

Conditions leading hail may arise quickly and unpredictably with little or no warning (Warning Lead Times =8). Hail events are relatively localized (Geography Affected = 2) and when they occur fatalities very rare and injuries uncommon (Bodily Harm = 1). Economic loss due to hail has not been extensive in Twin Falls County (Economic Loss = 2), and reconstruction resources are generally left to individuals and families (Reconstruction Assistance = 1). The total Magnitude score is, therefore, fourteen (14) which, for Twin Falls County, is in the "Medium" range. Historical records for hail storms are available and reliable, indicating that such events occur relatively frequently in Twin Falls County (Frequency = High).

Tornado

Description

The NWS describes tornado as, "a violently rotating column of air, usually pendant to a cumulonimbus, with circulation reaching the ground. It nearly always starts as a funnel cloud and may be accompanied by a loud roaring noise. On a local scale, it is the most destructive of all atmospheric phenomena." Like hail, most tornadoes are spawned by supercell thunderstorms. They usually last only a few minutes although some have lasted more than an hour and traveled several miles. Wind speeds within tornadoes are estimated based on the damage caused and expressed using the Enhanced Fujita (EF) Scale (Table 4.1.5)

EF scale	Class	Wind speed		Description
		mph	km/h	
F0	weak	65-85	105-137	Gale
F1	weak	86-110	138-177	Moderate
F2	strong	111-135	178-217	Significant
F3	strong	136-165	218-266	Severe
F4	violent	166-200	267-322	Devastating
F5	violent	> 200	> 322	Incredible

Table 4.1.5
Enhanced Fujita (EF) Scale for Estimation of Tornado Wind Speeds
http://www.srh.noaa.gov/srh/jetstream/mesoscale/tornado.htm

Idaho has relatively few tornadoes, averaging three reported per year between 1953 and 2004. Tornadoes of F2 strength or greater are extremely rare in Idaho.

Historical Tornado Events

Place	Date	Time	Event	Magnitude	Reported Damage
Twin Falls	9/8/1930		Tornado		
Twin Falls County	6/5/1957	3:45 PM	Tornado	F1	$0.00
Twin Falls County	9/8/1985	6:00 PM	Tornado	F1	$25,000.00
Twin Falls County	6/24/1986	9:00 PM	Tornado	F1	$3,000.00
Twin Falls County	4/20/1990	2:24 PM	Tornado	F0	$0.00
Twin Falls County	9/3/1990	3:15 PM	Tornado	F0	$0.00
Twin Falls County	9/10/1991	3:00 PM	Tornado	F0	$0.00
Twin Falls City	3/17/1993	6:00 PM	Tornado	F0	$0.00
Twin Falls County	3/17/1993	7:14 PM	Tornado	F0	$0.00
Twin Falls County	5/15/1993	2:45 PM	Funnel Cloud	NA	$0.00
Twin Falls County	8/11/1993	2:00 PM	Funnel Cloud	NA	$0.00
Twin Falls County	6/9/1995	2:45 PM	Funnel Cloud	NA	$0.00
Twin Falls County	6/12/1997	5:45 PM	Funnel Cloud	NA	$0.00
City of Buhl	5/12/1998	1:45 PM	Tornado	F0	$0.00
Twin Falls	6/10/1998	11:13 AM	Funnel Cloud	NA	$0.00

Table 4.1.6 – Twin Falls County Historical Tornado Events

According the NWS Storm Event Database Twin Falls County has experienced nine (9) tornadoes since 1957 (Table 4.1.6). Three (3) of those tornadoes were magnitude F1 on the EF Scale. Those three (3) events caused an estimated $28,000 in damage. The remaining six (6) tornadoes registered F0 on the EF Scale and caused little to no damage. The following map (Figure 4.1.11) shows the locations of those tornadoes which follow the Snake River Plain through the Magic Valley. This area is the most heavily populated and farmed in Twin Falls County.

While the frequency of tornado occurrences in the County is relatively low according to historical data, but there is an increase in the number of events from 1985 to the present. This increase is probably due, in large part, to the evolution of remote sensing and data collection technology rather than an actual increase in the numbers of tornadoes.

Impacts

Loss of utilities (primarily due to fallen trees) is common following tornadoes and, depending on circumstances, communities might be deprived of almost any kind of goods and services including food, water and medical care. Agriculturally, crop and livestock loss is also possible as is loss of timber production.

Loss Estimates

Since 1930 Twin Falls County has experienced fifteen (15) tornados with reported losses totaling $28,000. Only two (2) tornados were reported to have created a property loss.

Hazard Evaluation

Historically, tornadoes are rare in Twin Falls County and, when they do occur, are not severe. They do, however, occur most frequently in the County's most highly populated area.

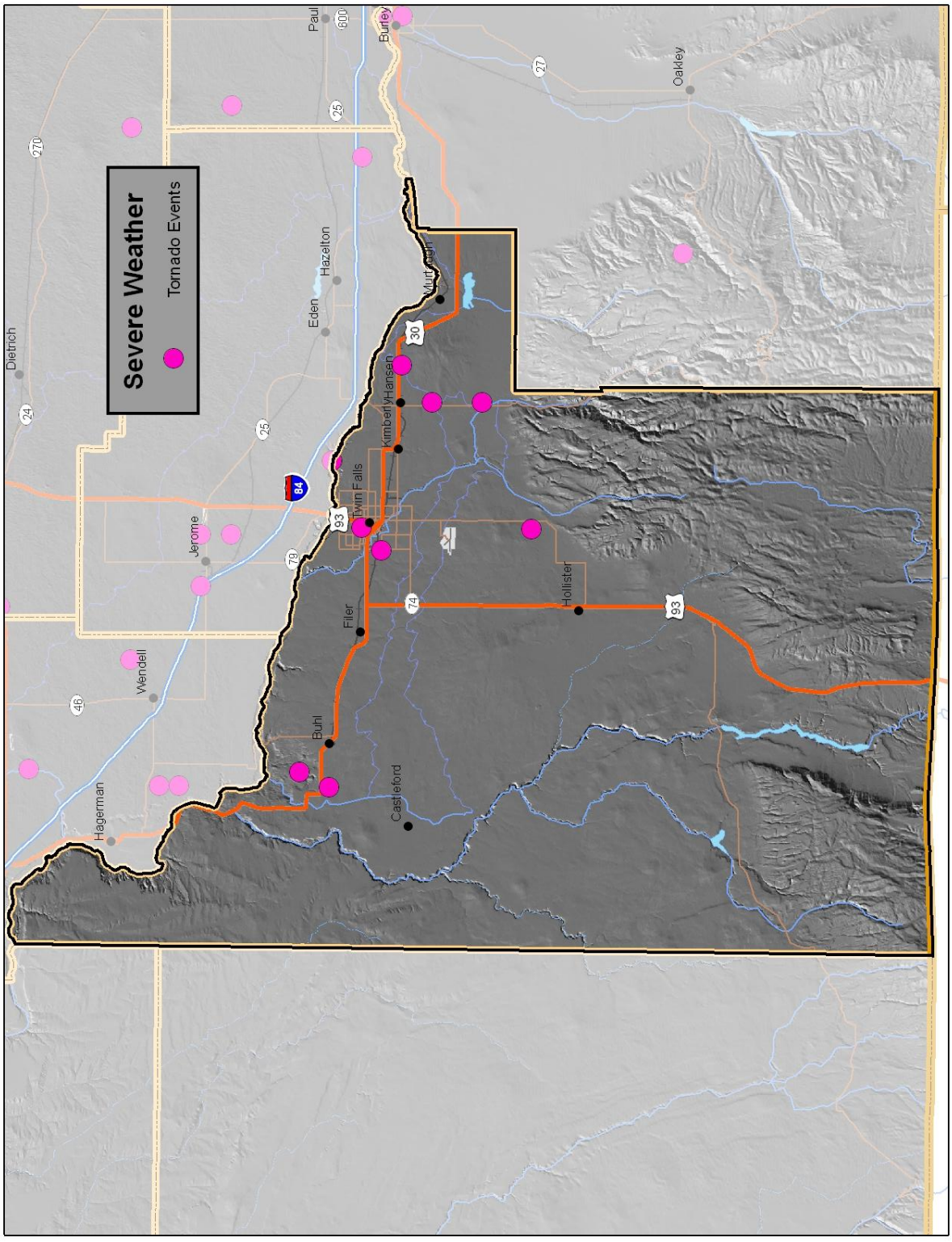


Figure 4.1.11
Twin Falls County Historical Tornado Event Map

Repetitive Loss - none

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

Tornado has a magnitude score of 15

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Magnitude/Frequency Scoring Rationale

Conditions leading to tornado formation may arise quickly and unpredictably with little or no warning (Warning Lead Times =8). The path of a tornado is usually relatively localized (Geography Affected = 2) and given their historically low F-scale magnitude in Twin Falls County fatalities and injuries are unlikely (Bodily Harm = 1). Some economic loss due to structural damage is possible (Economic Loss = 2), but only local resources would be required for reconstruction (Reconstruction Assistance = 2). The total Magnitude score is, therefore, fifteen (15) which, for Twin Falls County, is in the "Medium" range. Historical records for tornadoes are available and reliable, indicating that tornadoes occur in the five to twenty-five year range in Twin Falls County (Frequency = Medium).

Straight Line Wind

Description

The term "straight line wind" is used to describe any wind not associated with rotation, particularly tornadoes. Of concern is "high wind," defined by the NWS as, "Sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration." Like tornadoes, strong, straight line winds are generated by thunderstorms and they can cause similar damage. Straight line wind speeds can approach 150 mph, equivalent to those in an F3 tornado.

Historical Frequencies

Table 4.1.7 lists high wind events in Twin Falls County. The Team found thirty-three (33) recorded high wind events with the National Climatic Data Center. The winds follow the Snake River Plain and extend South following US Hwy 93 into Nevada (Figure 4.1.12). Again, these are the most populous and heavily farmed areas in the County. However, not all recorded high wind events are found on the map due to reporters not giving exact locations.

Place	Date	Time	Event	Magnitude	Estimated Damage
Twin Falls County	7/24/1958	3:00 PM	Thunderstorm Winds	unk	$0.00
Twin Falls County	7/26/1965	4:30 AM	Thunderstorm Winds	unk	$0.00
Twin Falls County	9/9/1967	6:00 PM	Thunderstorm Winds	unk	$0.00
Twin Falls County	9/29/1969	7:00 PM	Thunderstorm Winds	unk	$0.00
Twin Falls County	7/18/1970	9:00 PM	Thunderstorm Winds	unk	$0.00
Twin Falls County	6/22/1973	8:00 PM	Thunderstorm Winds	unk	$0.00
Twin Falls County	7/9/1983	5:00 PM	Thunderstorm Winds	unk	$0.00
Twin Falls County	8/22/1983	5:00 PM	Thunderstorm Winds	unk	$0.00
Twin Falls County	4/8/1984	3:00 PM	Thunderstorm Winds	unk	$0.00
Twin Falls County	5/13/1984	7:00 PM	Thunderstorm Winds	52 kts.	$0.00
Twin Falls County	7/6/1985	8:30 PM	Thunderstorm Winds	unk	$0.00
Twin Falls County	3/23/1988	10:45 AM	Thunderstorm Winds	50 kts.	$0.00
Twin Falls County	5/10/1989	4:30 PM	Thunderstorm Winds	50 kts.	$0.00
Twin Falls County	3/4/1991	9:38 PM	Thunderstorm Winds	60 kts.	$0.00
Twin Falls County	8/4/1991	3:10 PM	Thunderstorm Winds	55 kts.	$0.00
Twin Falls County	8/27/1991	5:30 PM	Thunderstorm Winds	unk	$0.00
Twin Falls County	9/10/1991	3:30 PM	Thunderstorm Winds	unk	$0.00
Twin Falls County	4/17/1992	11:40 AM	Thunderstorm Winds	60 kts.	$0.00
Kimberly	3/17/1993	5:10 PM	Thunderstorm Winds	unk	$500,000.00
Twin Falls County	5/3/1993	5:00 PM	Thunderstorm Winds	unk	$50,000.00
Twin Falls County	5/6/1994	6:53 PM	Thunderstorm Winds	unk	$500,000.00
Hollister	6/13/1996	3:20 PM	Thunderstorm Winds	60 kts.	$0.00
Filer	7/16/1996	2:20 PM	Thunderstorm Winds	60 kts.	$15,000.00
Twin Falls City	7/16/1996	3:00 PM	Thunderstorm Winds	60 kts.	$50,000.00
Filer	7/7/1998	7:00 PM	Thunderstorm Winds	50 kts.	$25,000.00
Filer	7/30/1998	3:14 PM	Thunderstorm Winds	61 kts.	$200,000.00
South TF County	2/14/2000	12:00 PM	High Wind	74 kts	$0.00

Place	Date	Time	Event	Magnitude	Estimated Damage
Twin Falls City	8/4/2000	3:29 PM	Thunderstorm Winds	60 kts.	$0.00
Twin Falls Airport	6/26/2002	2:58 PM	Thunderstorm Winds	53 kts.	$0.00
Rogerson	7/14/2002	6:25 PM	Thunderstorm Winds	50 kts.	$0.00
Kimberly	8/22/2003	5:51 PM	Thunderstorm Winds	60 kts.	$0.00
South TF County	6/13/2006	3:00 PM	High Wind	54 kts	$.00
Hollister	8/6/2006	10:05 PM	Thunderstorm Winds	52 kts.	

Table 4.1.7
Twin Falls County Historical Wind Events

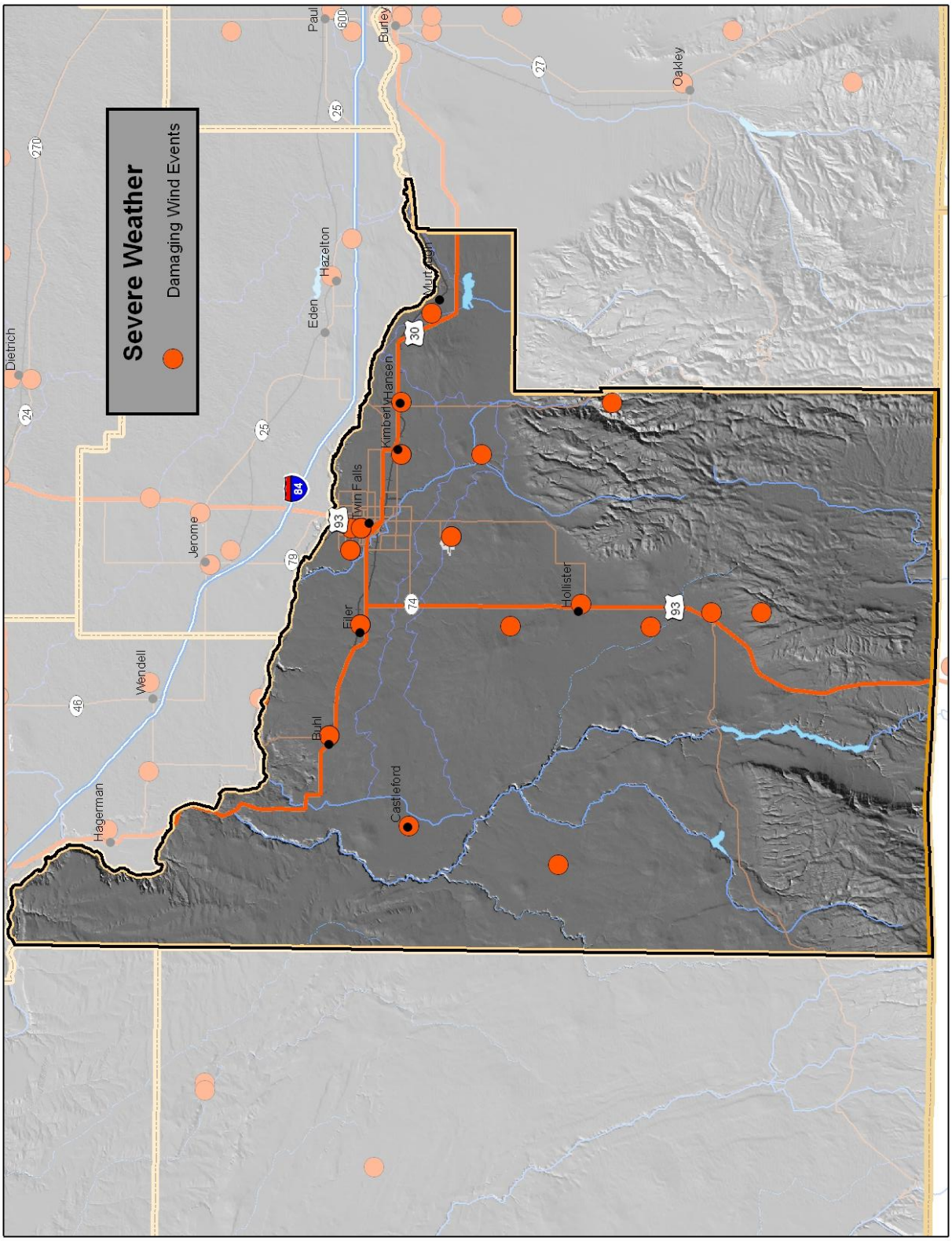


Figure 4.1.12
Twin Falls County Historic Damaging Wind Event Map

Relatively high velocity straight line winds occur frequently in Twin Falls County. In the year 2006, for instance, wind gusts over 30 mph were recorded on 120 of the 365 days (Table 4.1.8).

High Wind Gusts for Twin Falls County January 2006 – December 2006					
Year/Month/Day	**Average Speed**	**Maximum 5 Second Speed**	**Year/Month/Day**	**Average Speed**	**Maximum 2 Minute Speed**
2006/03/06	8.3	30	2006/01/27	12	25
2006/01/10	8.4	30	2006/01/16	12.1	25
2006/03/24	8.7	30	2006/05/07	14.2	25
2006/04/14	10	30	2006/01/08	16.2	25
2006/09/15	10.2	30	2006/03/24	8.7	25
2006/12/09	10.4	30	2006/06/14	14.2	25
2006/12/22	12	30	2006/03/18	18.4	25
2006/02/09	12.7	30	2006/05/28	16.7	25
2006/02/01	13.2	30	2006/07/23	9.8	25
2006/06/14	14.2	30	2006/08/16	9.9	25
2006/02/21	14.9	30	2006/10/04	10.8	25
2006/09/20	15.1	30	2006/01/02	11.3	25
2006/05/09	16.2	30	2006/09/14	11.3	25
2006/02/17	17	30	2006/03/28	11.1	26
2006/03/18	18.4	30	2006/04/08	12.4	26
2006/08/08	10.8	31	2006/02/09	12.7	26
2006/05/26	11.7	31	2006/02/21	14.9	26
2006/11/08	13.2	31	2006/02/17	17	26
2006/06/15	13.5	31	2006/08/08	10.8	26
2006/02/05	15.4	31	2006/05/26	11.7	26
2006/10/07	16.4	31	2006/02/05	15.4	26
2006/05/28	16.7	31	2006/04/12	10.6	26
2006/05/20	8.5	32	2006/04/27	16.1	26
2006/07/23	9.8	32	2006/08/03	8.7	26
2006/08/16	9.9	32	2006/08/10	9.6	26
2006/04/12	10.6	32	2006/07/25	9	26
2006/04/04	10.6	32	2006/12/14	9.3	26
2006/10/04	10.8	32	2006/11/08	13.2	28
2006/03/02	11	32	2006/06/15	13.5	28
2006/01/02	11.3	32	2006/10/07	16.4	28
2006/10/16	12.3	32	2006/04/04	10.6	28
2006/12/13	12.8	32	2006/03/02	11	28
2006/01/31	13.5	32	2006/10/16	12.3	28
2006/06/16	15.3	32	2006/01/31	13.5	28
2006/04/27	16.1	32	2006/06/16	15.3	28
2006/05/08	16.9	32	2006/05/08	16.9	28
2006/05/19	8.2	33	2006/03/31	8.4	28
2006/03/31	8.4	33	2006/07/06	9.2	28
2006/08/03	8.7	33	2006/11/21	14.2	28
2006/07/05	9.4	33	2006/12/15	14.8	28

High Wind Gusts for Twin Falls County January 2006 – December 2006					
Year/Month/Day	**Average Speed**	**Maximum 5 Second Speed**	**Year/Month/Day**	**Average Speed**	**Maximum 2 Minute Speed**
2006/08/10	9.6	33	2006/04/23	8.5	28
2006/09/14	11.3	33	2006/10/29	10	28
2006/07/12	11.3	33	2006/05/27	6.7	28
2006/06/19	15.3	33	2006/05/19	8.2	29
2006/03/08	17.2	33	2006/07/05	9.4	29
2006/11/16	8.5	35	2006/07/12	11.3	29
2006/07/25	9	35	2006/06/19	15.3	29
2006/07/06	9.2	35	2006/03/08	17.2	29
2006/12/14	9.3	35	2006/11/27	11.9	29
2006/11/27	11.9	35	2006/02/18	14.8	29
2006/12/10	13.1	35	2006/11/10	15.4	29
2006/11/21	14.2	35	2006/05/02	16.1	29
2006/12/15	14.8	35	2006/09/21	16	29
2006/02/18	14.8	35	2006/02/22	16.1	29
2006/11/10	15.4	35	2006/09/06	9.5	29
2006/05/02	16.1	35	2006/09/19	9.9	29
2006/06/09	7.6	36	2006/12/10	13.1	30
2006/07/02	8.1	36	2006/03/03	9.9	30
2006/04/23	8.5	36	2006/01/03	13.5	30
2006/03/03	9.9	36	2006/11/11	13.5	30
2006/10/29	10	36	2006/08/30	16.2	30
2006/01/30	12.6	36	2006/04/30	19.2	30
2006/01/03	13.5	36	2006/10/05	12.7	30
2006/11/11	13.5	36	2006/08/07	9.8	30
2006/06/13	15	36	2006/10/30	17.2	30
2006/09/21	16	36	20060/6/09	7.6	31
2006/02/22	16.1	36	2006/08/15	8.5	31
2006/08/30	16.2	36	2006/05/22	10.9	31
2006/04/30	19.2	36	2006/04/15	13	31
2006/05/27	6.7	37	2006/06/04	13.1	31
2006/10/05	12.7	37	2006/11/12	13.8	31
2006/03/29	13.1	37	2006/03/14	15.9	31
2006/02/10	15.7	37	2006/08/14	7.1	31
2006/09/16	16.9	37	2006/01/30	12.6	32
2006/08/15	8.5	38	2006/06/13	15	32
2006/08/07	9.8	38	2006/03/29	13.1	32
2006/05/22	10.9	38	2006/02/10	15.7	32
2006/05/21	11.4	38	2006/09/16	16.9	32
2006/04/15	13	38	2006/05/21	11.4	32
2006/06/04	13.1	38	2006/01/11	15.1	32
2006/11/12	13.8	38	2006/03/04	15.6	32
2006/01/11	15.1	38	2006/01/01	16.4	32
2006/03/14	15.9	38	2006/06/08	10.5	32
2006/09/06	9.5	39	2006/12/23	10.8	33

High Wind Gusts for Twin Falls County January 2006 – December 2006					
Year/Month/Day	**Average Speed**	**Maximum 5 Second Speed**	**Year/Month/Day**	**Average Speed**	**Maximum 2 Minute Speed**
2006/12/23	10.8	39	2006/02/27	11	33
2006/02/27	11	39	2006/03/26	17	33
2006/03/04	15.6	39	2006/01/07	9.3	33
2006/03/26	17	39	2006/07/11	12.9	33
2006/08/14	7.1	40	2006/10/24	7.4	33
2006/01/07	9.3	40	2006/07/22	10.4	33
2006/09/19	9.9	40	2006/06/07	10.6	33
2006/07/11	12.9	40	2006/02/04	13.6	35
2006/02/04	13.6	40	2006/05/18	14	35
2006/10/30	17.2	40	2006/10/25	22.8	35
2006/10/24	7.4	41	2006/12/26	10.5	36
2006/12/26	10.5	41	2006/01/28	15.3	36
2006/01/01	16.4	41	2006/04/01	15.3	36
2006/07/22	10.4	43	2006/12/28	17.3	36
2006/04/29	12.1	43	2006/09/04	10	36
2006/11/23	13.3	43	2006/10/20	19.8	36
2006/05/18	14	43	2006/11/13	16.1	36
2006/01/28	15.3	43	2006/11/23	13.3	37
2006/04/01	15.3	43	2006/01/14	11.5	37
2006/12/28	17.3	43	2006/12/27	16.2	37
2006/04/17	21.6	43	2006/04/29	12.1	38
2006/09/04	10	44	2006/04/17	21.6	38
2006/01/14	11.5	44	2006/01/15	26.4	38
2006/12/27	16.2	44	2006/02/28	21.5	40
2006/10/20	19.8	44	2006/11/14	18.7	43
2006/01/15	26.4	44	2006/08/04	9.3	43
2006/06/08	10.5	45	2006/03/09	18.1	44
2006/06/07	10.6	45	2006/04/06	30.8	48
2006/11/13	16.1	45	2006/03/25	21.5	58
2006/10/25	22.8	45			
2006/02/28	21.5	49			
2006/11/14	18.7	51			
2006/08/04	9.3	54			
2006/03/09	18.1	54			
2006/04/06	30.8	55			
2006/03/25	21.5	68			

Table 4.1.8
Wind Gust Speeds for Twin Falls County 2006
Source: National Climatic Data Center

Impacts

The impacts of straight line winds are virtually the same as those from tornadoes with similar wind speeds. The damage is distinguishable from that of a tornado only in that the debris generally deposited in nearly parallel rows. Downbursts are particularly hazardous to aircraft in flight.

Loss Estimates

Historically, the majority of damage has been done to outlying buildings and to crops, with losses ranging from $15,000 to $500,000 (Table 4.1.7). It should be noted that losses reported in the National Weather Service (NWS) database are most likely seriously underreported, primarily because property owners fail to report minor damages. Given the frequency of high straight line wind events, these minor damages undoubtedly add up to a large sum. Thus, the impact of severe wind events probably greatly exceeds the total reported Twin Falls County losses of $890,000.

Hazard Evaluation

Straight line wind events have occurred in nearly every part of the County but are most frequent in the Snake River Plain and along the U.S. Highway 93 corridor. Heavy damages have occurred in some instances and it is likely that smaller, unreported losses are often sustained.

Agricultural land maintenance practices make dust storms likely during the spring and fall. These are particularly hazardous to traffic on U.S. Highway 93.

The Hansen and Twin Falls bridges spanning the Snake River Canyon are routinely affected by high wind gusts resulting from the wind tunnel effect of the canyon. High profile vehicles such as tractor-trailers have been blown over on these bridges during intense wind storms in the past few years.

Repetitive Loss – There is repetitive loss annually due to straight line winds in Twin Falls County. The loss is primary to out buildings and fences. Siding is at times removed from homes and businesses. Top soil is lost in the spring especially during the planting season where the soil is loose and little moisture is present.

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

Straight Line Winds have a magnitude score of 13

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Magnitude/Frequency Scoring Rationale

Conditions leading straight line winds may arise with only hours of warning (Warning Lead Times = 4). Straight line wind related events geographical impacts large areas of Twin Falls County (Geography Affected = 4). Death or injury is rare in Twin Falls County (Bodily Harm = 1) but some economic loss due to structure damages can occur (Economic Loss = 2). Reconstruction from such damage may take local assistance (Reconstruction Assistance = 2). The total Magnitude score is, therefore, thirteen (13) which, for Twin Falls County, is in the "Medium" range. Historical records for straight line winds are available and reliable, indicating that they occur yearly to several times a year in Twin Falls County (Frequency = High).

Section 4.2 Flooding

Flooding is defined by NWS as "the inundation of normally dry areas as a result of increased water levels in an established water course." River flooding, the condition where the river rises to overflow its natural banks, may occur due to a number of causes including prolonged, general rainfall, locally intense thunderstorms (see Flash Flood above), snowmelt, and ice jams. In addition to these natural events, there are a number of factors controlled by human activity that may cause or contribute to flooding. These include dam failure (discussed below), levee failure, and activities that increase the rate and amount of runoff such as paving, reducing ground cover, and clearing forested areas. Flooding is a periodic event along most rivers with the frequency depending on local conditions and controls such as dams and levees. The land along rivers that is identified as being susceptible to flooding is called the floodplain. The Federal standard for floodplain management under the National Flood Insurance Plan (NIFP) is the "100-year floodplain." This area is chosen using historical data such that in any given year there is a one percent chance of a "Base Flood" (also known as "100-year Flood" or "Regulatory Flood"). A Base Flood is one that covers or exceeds the 100-year floodplain. In Idaho, flooding most commonly occurs in the spring of the year and is caused by snowmelt. Floods occur in Idaho every one to two years and are considered the most serious and costly natural hazard affecting the State. In the twenty-five years from 1976 to 2000 there were five Federal and twenty-eight State disaster declarations due to flooding. The amount of damage caused by a flood is influenced by the speed and volume of the water flow, the length of time the impacted area is inundated, the amount of sediment and debris carried and deposited, and the amount of erosion that may take place.

Flooding is a dynamic natural process. Along rivers, streams and coastal bluffs a cycle of erosion and deposition is continuously rearranging and rejuvenating the aquatic and terrestrial systems. Although many plants, animals and insects have evolved to accommodate and take advantage of these ever-changing environments, property and infrastructure damage often occurs when people develop coastal areas and floodplains and natural processes are altered or ignored.

Flooding can also threaten life, safety and health and often results in substantial damage to infrastructure, homes, and other property. The extent of damage caused by a flood depends on the topography, soils and vegetation in an area, the depth and duration of flooding, velocity of flow, rate of rise, and the amount and type of development in the floodplain.

Flood Terminology

A number of flood-related terms are frequently used in this plan and are defined below.

Flood Insurance Study (FIS): A *Flood Insurance Study* is the official report provided by the Federal Insurance Administration, which provides flood profiles, the flood boundary-floodway map, and the water surface elevation of the estimated 100-year base flood.

Flood Insurance Rate Map (FIRM): The Flood Insurance Rate Maps (FIRM) are the official maps on which the Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.

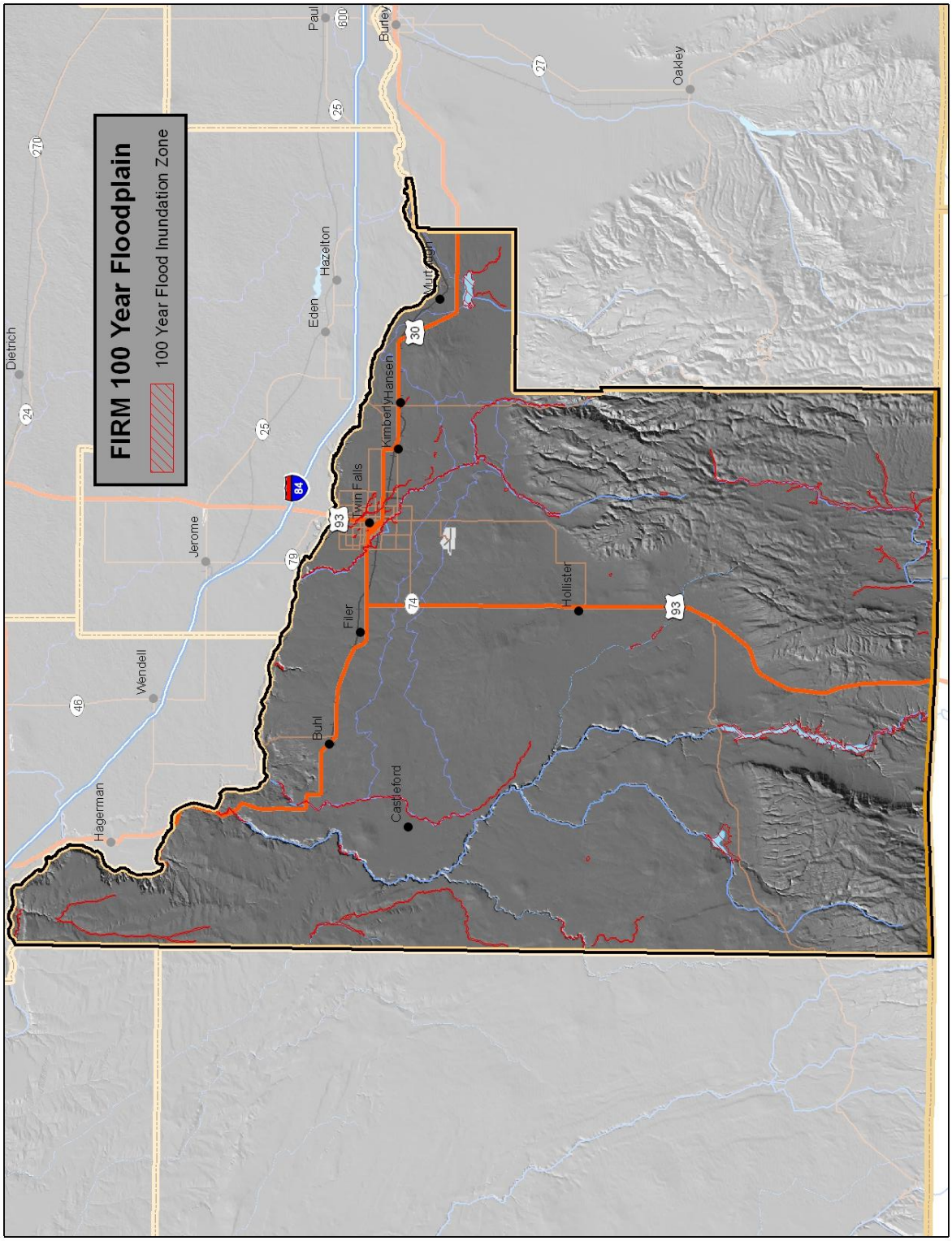


Figure 4.2.1 FIRM 100 Year Floodplain

100-year Base Flood: Base Flood means the flood having a 1% chance of being equaled or exceeded in any given year, also referred to as the "100-year flood".

Designation on the floodplain (FIRM) maps always includes the letters A or V.

Floodplain: A floodplain is land adjacent to a lake, river, stream, estuary or other water body that is subject to flooding. If left undisturbed, the floodplain serves to store and discharge excess floodwater. In riverine systems, the floodplain includes the floodway.

Floodway: "Floodway" means the channel of a river or other watercourse and the adjacent areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

Types of Flooding

Flooding can occur in a number of ways, and many times are not independent of each other and can occur simultaneously during a flood event: The Types of Flooding considered for this Plan include:

- heavy rainfall;
- urban storm water overflow;
- rapid snowmelt;
- rising ground-water (generally in conjunction with heavy prolonged rainfall and saturated conditions);
- riverine ice jams;
- flash floods;
- fluctuating lake levels;
- alluvial fan flooding;

Floodplain Management

Twin Falls County participates in the NFIP as well as the City of Twin Falls, the City of Filer, and the City of Hansen. Twin Falls County has a Community Rating System designation of nine (9).

Twin Falls County has no communities within the 100 year flood plain hazard areas that are not participating in the NFIP. Twin Falls County has no communities under suspension or revocation of participation in the NFIP (IDWR 2004).

An important part of being an NFIP community is the availability of low cost flood insurance for those homes and business within designated floodplains, or in areas that are subject to flooding, but that are not designated as Special Flood Hazard Areas. There are areas where there is a high potential for flash floods, as discussed in the next section that are not participating in the NFIP.

As evidenced in the Community Questionnaire, overall participation by individuals and business in the NFIP appears to be low. Potential reasons for continuing low participation in the program are:

- Current cost of insurance is prohibitive.
- A lack of knowledge about the existence of the availability of low cost flood

insurance.

- Home and business owners unaware of their vulnerability to flood events.

The last two reasons can be addressed through public education. The first could be addressed by all communities in the County taking advantage of the Community Rating System (CRS). To encourage communities to go beyond the minimum requirements and further prevent and protect against flood damage, the NFIP established the Community Rating System (CRS). To qualify for CRS, communities can do things like make building codes more rigorous, maintain drainage systems, and inform residents of flood risk. In exchange for becoming more flood ready, the CRS community's residents are offered discounted premium rates. Based on the community's CRS ratings, they can qualify for up to a 45% discount of annual flood insurance premiums. Of the Twin Falls County communities that participate in the NFIP, several have earned a discount on their flood insurance rates through the Community Rating System (CRS).

FEMA has developed FIRM's for the following streams and rivers in Twin Falls County:

- Deep Creek
- Cottonwood Creek
- Hot Creek
- Lost Creek
- Perrine Coulee
- Rock Creek
- Salmon Falls Creek
- Shoshone Creek
- Snake River

Flash Flood

Flash flood is defined by NWS as, "A rapid and extreme flow of high water into a normally dry area, or a rapid water level rise in a stream or creek above a predetermined flood level, beginning within six hours of the causative event (e.g., intense rainfall, dam failure, ice jam). Ongoing flooding can intensify to flash flooding in cases where intense rainfall results in a rapid surge of rising flood waters." Flash floods differ from floods (discussed below under River Flooding) in the rapidity with which they develop. Floods generally develop over a period of several days, providing more warning time and time for preparation and evacuation. Flash floods occur with little or no warning. They may occur during thunderstorms due to rapid runoff from steep terrain, from areas where the soil is already saturated, or in urban areas where vegetation has been removed and pavement has replaced exposed soil. Flash floods may also arise as the result of dam failure (discussed below) or the breakup of ice jams.

Historical Frequencies

Place	Date	Time	Event	Magnitude/details
Rock Creek	July 25, 1913	unk	Flash Flood	Water 2 feet above high water within a couple hours. Road washed out
Twin Falls	Sept 3, 1945	Unk	Flash Flood	Basements and gutters flooded
Three Creek	June 20, 1963	Unk	Flash Flood	Roads flooded on Roseworth tract
Filer/Twin Falls	June 7, 1996	Unk	Flash Flood	Flooding on highway
Twin Falls	Aug 7, 1997	Unk	Flash Flood	Minor street flooding in Twin Falls
Hollister	June 8, 2006	Unk	Flash Flood	Flooding on highway
Rogerson	July 25, 2006	Unk	Flash Flood	Flooding on road/ road closed

Table 4.2.1
Twin Falls County Historical Flash Flood Events

Flash flooding occurs yearly in Twin Falls County. The flash flooding risk within the County will be assessed by determining the following factors:

- Probability – the likelihood that flash flooding will occur in a given area
- Severity – the potential for damage in an area where flash flooding is likely
- Asset Inventory – the assets (people, structures, property, etc.) in an affected area

Risk is expressed in terms of number of events per year times the magnitude of the event. The probability (likelihood) that flash flooding will occur in a given area in the County was assessed using the Relative Flash Flood Potential Index (RFFPI) developed by the NWS. The RFFPI estimates flash flooding potential on a scale of low to high using factors including: soil infiltration rates, slope, percent impervious surface, forest density, and land use. As shown in Figure 4.2.2, most of Twin Falls County falls into the medium to high range for flash flood potential. Areas of high potential are concentrated in the central to northwest portion of the County. This area extends west of Rock Creek to the County's western border and south of the Snake River to Hollister. The populated areas that have a high potential for flash floods include: Hollister, Castleford, Buhl, Filer, and

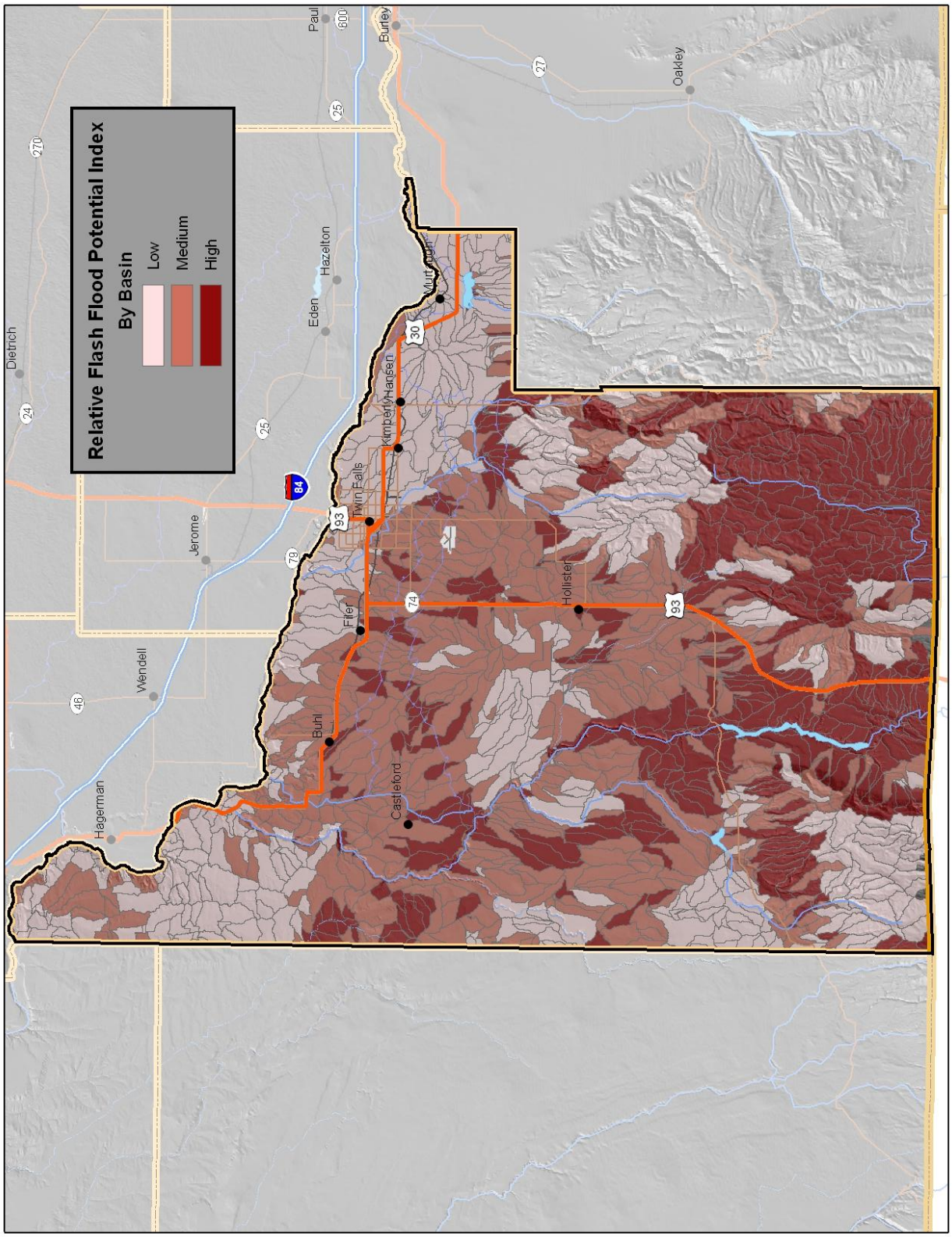


Figure 4.2.2
Twin Falls County Relative Flash Flood Potential Index Map

Twin Falls City. Significant agricultural use lands are also in areas with high potential for flash flooding with the majority of potentially affected crops being corn and wheat.

Flash flood severity is primarily linked to water velocity which, in turn, is directly linked to the slope of the affected area. Because Twin Falls County has relatively large changes in elevation, with a minimum elevation of 2,657 feet and an a maximum of 7,828 feet above sea level, there are areas of high potential flash flooding severity within the County.

The area extending from ten to twelve miles south of the Snake River is a flat plain that forms part of the Magic Valley. This area is mostly agricultural and developed land with little change in elevation. It is, therefore, assigned a relatively low severity potential in spite of its relatively high likelihood of flash flooding. The south of the plain consists of rolling hills with minor changes in elevation. The land cover in this area consists of grass and shrub lands. The changes in topography in this region increase the possible severity of flash floods to a medium severity. The southern and western portions of the County are primarily owned by the National Forest Service and are mountainous with major changes in elevation. This, therefore, is the portion of the County that has the potential for the most severe flash flood consequences.

Impacts

Because flash floods develop so rapidly, people on foot or in automobiles may be stranded or may be swept away and injured or drowned. They are characterized by high velocity water flow and large amounts of debris, both of which cause damage to or destroy structures and other objects in their path. Other impacts are discussed below under River Flooding.

Loss Estimates

Lost estimates for a probable flash flood event in Twin Falls County are calculated based on the following assumptions[23]:

- Flood Depth – 1 foot average
- Residential Parcels impacted – 9,229
- Total parcels impacted – 17,198
- Total number of residents impacted – 2,307
- Maximum value of an individual parcel in flash flood prone areas - $4,103,670
- Average parcel value - $31,654
- Total valuation of all property in flood plain - $544,388,269
- Total Potential Building Loss - $81,660,000
- Total Potential Contents Loss - $122,490,000
- Functional down time for each damaged structure – 23 days
- Displacement time for each damaged structure – 134 days

[23] FEMA State and Local Mitigation Program Planning How to Guide: Understanding your Risks

Hazard Summary

The potential for flash flooding is significant in the Buhl area. Buhl currently does not participate in the National Flood Insurance Program because they are out of the defined "flood plain." As the analysis has shown, however, flash flooding does occur and there is some historical information to demonstrate that losses can be expected.

Areas of the County where significant development has occurred have become more prone to flash flooding because of increased impervious surface area. As farm land is developed and housing is built in traditionally agricultural areas, additional impervious surface areas increase the need for proper storm water collection and drainage.

Repetitive Loss - none

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

Flash Flood has a magnitude score of 15

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Magnitude/Frequency Scoring Rationale

Conditions leading to flash flooding may arise quickly and unpredictably with little or no warning (Warning Lead Times = 8). The vulnerability to flash flooding in Twin Falls County is reasonably limited (Geography Affected = 2). Fatalities and injuries are improbable (Bodily Harm = 1), but some economic loss due to structural damage is possible (Economic Loss = 2) and may be extensive enough to require county resources for reconstruction (Reconstruction Assistance = 2). The total Magnitude score is, therefore, fifteen (15) which, for Twin Falls County, is in the "Medium" range. Historical records for flash flooding are

available and reliable, indicating that flash floods occur in the five to twenty-five year range in Twin Falls County (Frequency = Medium).

River or Stream Flooding

Description

River flooding, the condition where the river rises to overflow its natural banks, may occur due to a number of causes including prolonged, general rainfall, locally intense thunderstorms, snowmelt, and ice jams.

Historical Frequencies

Place	Date	Time	Event	Magnitude/details
Twin Falls	2/10/1962		Flood	Prolonged rain and warm temperatures melted mountain snow and forced high amounts of run-off into the lowlands.

Table 4.2.2
Historical Flood Events

Impacts

Human death and injury are sometimes occur as a result of river flooding but are not common. Human hazards during flooding include drowning, electrocution due to downed power lines, leaking gas lines, fires and explosions, hazardous chemicals and displaced wildlife. Economic loss and disruption of social systems are often enormous. Floods may destroy or damage structures, furnishings, business assets including records, crops, livestock, roads and highways, and railways. They often deprive large areas of electric service, potable water supplies, wastewater treatment, communications, and many other community services including medical care, and may do so for long periods of time.

Loss Estimates:

Lost estimates for a probable river/stream flood event in Twin Falls County are calculated based on the following assumptions[24]:

- Flood Depth of 2 feet average
- Residential Parcels impacted – 639
- Total Parcels impacted – 2182
- Total number of residents impacted – 1598
- Maximum value of an individual parcel in flood plain - $3,385,401
- Average parcel value - $30,409
- Total Valuation of all property in Flood Plain - $66,352,373
- Total Potential Building Loss – $13,270,000
- Total Content Loss - $19, 906,000
- Function Functional down time for each damaged structure – 30 days

[24] FEMA State and Local Mitigation Program Planning How to Guide: Understanding your Risks

- Displacement time for each damaged structure – 230 days

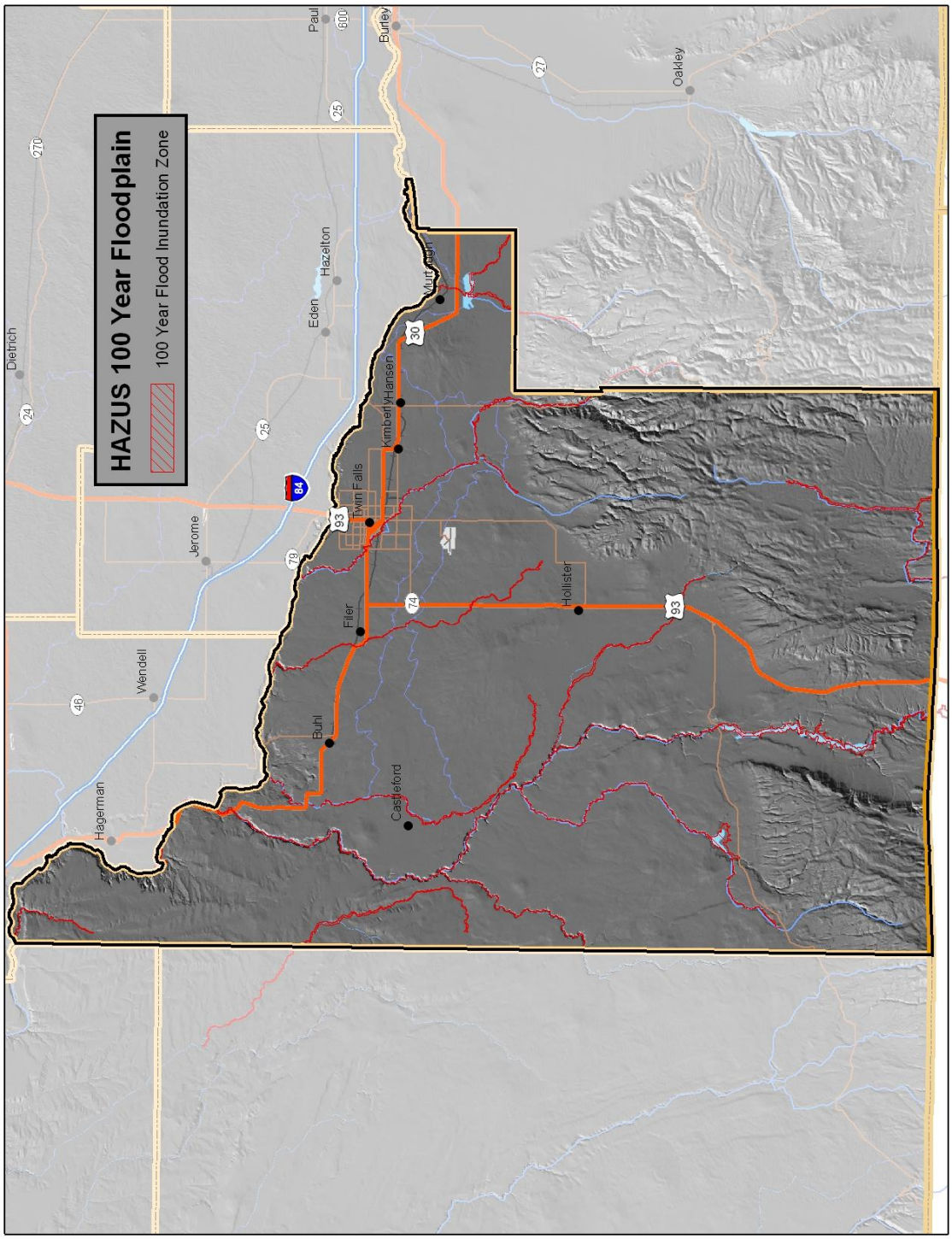


Figure 4.2.3
Twin Falls County HAZUS 100 Year Flood Plain

Hazard Evaluation

Repetitive Loss - none

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

River Flooding has a magnitude score of 13

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Magnitude/Frequency Scoring Rational

Conditions leading to river/stream flooding usually develop over a period of days (Warning Lead Times = 2). In Twin Falls County, such flooding affects multiple sections (Geography Affected = 4) but is expected to be the direct cause of little or no death or injury (Bodily Harm = 1). Major business interruption and some economic loss may be expected from river/stream flooding (Economic Loss = 2) and recovery is managed at the State level (Reconstruction Assistance = 4). The total Magnitude score is, therefore, Thirteen (13) which, for Twin Falls County, is in the "Medium" range. Historical records for river/stream flooding are available and reliable, indicating that such events may be expected in the five to twenty-five year range (Frequency = Medium).

Dam/Canal Failure

Description

Dam failure is the unintended release of impounded waters. Dams can fail for one or a combination of the following reasons:

- Overtopping caused by floods that exceed the capacity of the dam.
- Deliberate acts of sabotage.
- Structural failure of materials used in dam construction.
- Poor design and/or construction methods.
- Movement and/or failure of the foundation supporting the dam.
- Settlement and cracking of concrete or embankment dams.
- Piping and internal erosion of soil in embankment dams.
- Inadequate maintenance and upkeep.

Failures may be categorized into two types; component failure of a structure that does not result in a significant reservoir release, and uncontrolled breach failure that lead to a significant release. With an uncontrolled breach failure of a manmade dam there is a sudden release of the impounded water, sometimes with little warning. The ensuing flood wave and flooding have enormous destructive power.

Historical Frequencies

Place	Date	Event	Estimated Damage
Deep Creek	3/10/1910	Dam Failure	
Shoshone Falls	3/24/1910	Canal Break	
Highline Canal	2/27/1917	Canal Break	Homes evacuated and damaged, several thousand dollars to repair canal
Highline Canal	7/26/1917	Canal Break	Washed out property two miles down the draw
Lowline Canal	5/9/1918	Canal Break	Cut off Twin Falls Reservoir. Flooded farms
Buhl	1/5/1979	Canal Break	20 'break in main canal flooded farms and forced evacuation of families. Backed up sewer system in Twin Falls City

Table 4.2.3
Dam/Canal Failure Events

Dam Classifications

Each dam inspected by Idaho Water Resources given both a size and risk classification.

Size Classification

Small – 3: Twenty (20) feet high or less and a storage capacity of less than one hundred (100) acre feet of water.

Intermediate – 2: More than twenty (20) but less than forty (40) feet high or with a storage capacity of one hundred (100) to four thousand (4,000) acre feet of water.

Large – 1: Forty (40) feet high or more or with a storage capacity of more than four thousand (4,000) acre feet of water.

Risk Classification

This classification is used by IDWR to classify potential losses and damages anticipated in down-stream areas that could be attributable to failure of a dam during typical flow conditions.

Low Risk – 3: No permanent structures for human habitation; Minor damage to land, crops, agricultural, commercial or industrial facilities, transportation, utilities or other public facilities or values.

Significant Risk – 2: No concentrated urban development, one (1) or more permanent structures for human habitation which are potentially inundated with flood water at a depth of two (2) ft. or less or at a velocity of two (2) ft. per second or less. Significant damage to land, crops, agricultural, commercial or industrial facilities, loss of use and/or damage to transportation, utilities or other public facilities or values.

High Risk – 1: Urban development, or any permanent structure for human habitation which are potentially inundated with flood water at a depth of more than two (2) ft. or at a velocity of more than two (2) ft. per second. Major damage to land, crops, agricultural, commercial or industrial facilities, loss of use and/or damage to transportation, utilities or other public facilities or values.

Purposes Categories:

N-Industrial, B-Mining, O-Other, C-Commercial, P-Power, D-Domestic, Q-Fire Protection, E-Erosion Control, F-Flood Control, S-Stockwater, G-Wildlife Protection, T-Mine Tailings, H-Fish Propagation, I-Irrigation, J-Stockwater and Irrigation, K-Domestic, Stock and Irrigation, L-Domestic and Irrigation, M-Municipal Supply

Dam Type

Earth- Earth Fill, Rock- Rock Filled, CNGRV- Concrete Gravity, CNAR-Concrete Arch, MCNAR-Multiple Concrete Arch, TMCRB-Timber Crib, SLBT-lab and Buttress, RKMAS- Rock Masonry, Metal-Metal Sheet Pile, AUXDAM-Auxillary Dam

Table 4.2.4 provides a listing and ranking of the dams within Twin Falls County that are part of the IDWR Dam Safety Program.

Name	Stream	Purpose	Risk Category	Size Category	Type	Storage Capacity	Height
Murtaugh Lake	Snake River	OS	1	1	Earth	7720	39
Shoshone Falls	Snake River	P	2	2	Concrete gravity	750	22
Twin Falls	Snake River	P	2	2	Concrete gravity	1000	26

Name	Stream	Purpose	Risk Category	Size Category	Type	Storage Capacity	Height
Salmon Falls Upper	Snake River	PL	3	3	Concrete gravity	3000	10
Salmon Falls Lower	Snake River	P	1	1	Concrete gravity	18500	63
Salmon Falls Regulatory	Salmon Falls Creek	L	1	1	Concrete arch	230650	217
Salmon Falls Creek	Salmon Falls Creek	O	3	3	Earth	15	13.1
Salmon Falls Creek	Salmon Falls Creek	I	3	3	Concrete gravity	60	8
Deep Creek No. 1	Deep Creek	J	3	2	Earth	135	13
Deep Creek No. 2	Deep Creek	J	2	2	Earth	1500	39
Herziner	TR-Salmon Falls Creek	I	1	1	Earth	5	13
Cedar Creek	Cedar Creek	I	1	1	Earth	30000	84
Cedar Creek Holding	Cedar Creek OS	I	3	2	Earth	200	19.5
McMullen	Cottonwood Creek	I	2	2	Earth	350	22
Williams	North Cottonwood Creek	I	3	1	Earth	850	43
Ray	TR-Snake River	HR	3	3	Earth	20	19
Heil	Devil Creek OS	I	3	2	Earth	480	22
Munsee	Salmon Falls Creek OS	I	3	3	Earth	90	18
Leno	Mule Creek Springs	I	3	2	Earth	25	26.7
Silver Lake	Silver Creek	I	2	3	Earth	16	29
Heil No. 2	Devil Creek OS	J	3	3	Earth	22	18.6

Table 4.2.4
Dams in Twin Falls County

Loss Estimates

The Salmon Falls Dam is the largest dam in the County. A rough estimate of the inundation zone using HAZUS and the Twin Falls County GIS Parcel data provides the following loss estimate. Total Parcels – 296. Total Valuation - $3,023,383. The dam is privately owned and operated. The County is mapping homes in the inundation zone and will be developing a data base of contact points and developing methods for notification.

Hazard Evalution

In Twin Falls County there are

- Seven (7) small dams,
- Eight (8) intermediate sized dams,
- Six (6) large dams,

- Eleven (11) low risk dams,
- Five (5) significant risk dams, and
- Five (5) high risk dams.

Repetitive Loss - none

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

Dam/canal Failure has a magnitude score of 15

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Magnitude/Frequency Scoring Rationale

Warning time for a dam failure would be relatively short (Warning Lead Times = 4) and a relatively large portion of the County would be vulnerable (Geography Affected = 4). No deaths and serious injuries would be expected in Twin Falls County (Bodily Harm = 1) however, there would be some economic loss (Economic Loss = 2). State level reconstruction assistance would be required (Reconstruction Assistance = 4). The total Magnitude score is, therefore, twenty (15) which, for Twin Falls County, is in the "Medium" range. Historical records for dam failure are available and reliable, indicating that no such events have occurred in the County (Frequency = Low).

Section 4.3 Geologic Hazards

Geologic hazards are adverse conditions capable of causing loss of life and damage to property that involve the movement of geologic features or elements of the surface of the earth. There are a wide variety of such hazards that may be categorized as either sudden or slow phenomena. Slowly developing geologic hazards include soil erosion, sinkholes and other ground subsidence, and migrating sand dunes. Only sudden geologic hazards will be considered in this planning and will be limited to: earthquake, volcanic eruption, landslide/mudslide, and snow avalanche.

Earthquake

Description

The U.S. Geological Survey (USGS) defines earthquake as: "Ground shaking caused by the sudden release of accumulated strain by an abrupt shift of rock along a fracture in the Earth or by volcanic or magmatic activity, or other sudden stress changes in the Earth." The hazards associated with earthquake are essentially secondary to ground shaking (also called seismic waves) which may cause buildings to collapse, displacement or cracking of the earth's surface, flooding as a result of damage to dams or levees, and fires from ruptured gas lines, downed power lines and other sources. Earthquakes are measured both in terms of their inherent "magnitude" and in terms of their local "intensity." The magnitude of an earthquake is essentially a relative estimate of the total amount of seismic energy released and may be expressed using the familiar "Richter Scale" or using the "moment magnitude scale" now favored by most technical authorities. On either scale, significant damage can be expected from earthquakes with a magnitude of about 5.0 or higher. What determines the amount of damage that might occur in any given location, however, is not the magnitude of the earthquake but the intensity at that particular place. Earthquake intensity decreases with distance from the earthquake's "epicenter" (its focal point) but also depends on local geologic features such as depth of sediment and bedrock layers. Intensity is most commonly expressed using the "Modified Mercalli Intensity Scale." More quantitatively, intensity may be measured in terms of "peak ground acceleration" (PGA) expressed relative to the acceleration of gravity (g) and determined by seismographic instruments. While Mercalli and PGA intensities are arrived at differently, they correlate reasonably well. The locations most susceptible to earthquakes are known but there is little ability to predict an earthquake in the short term.

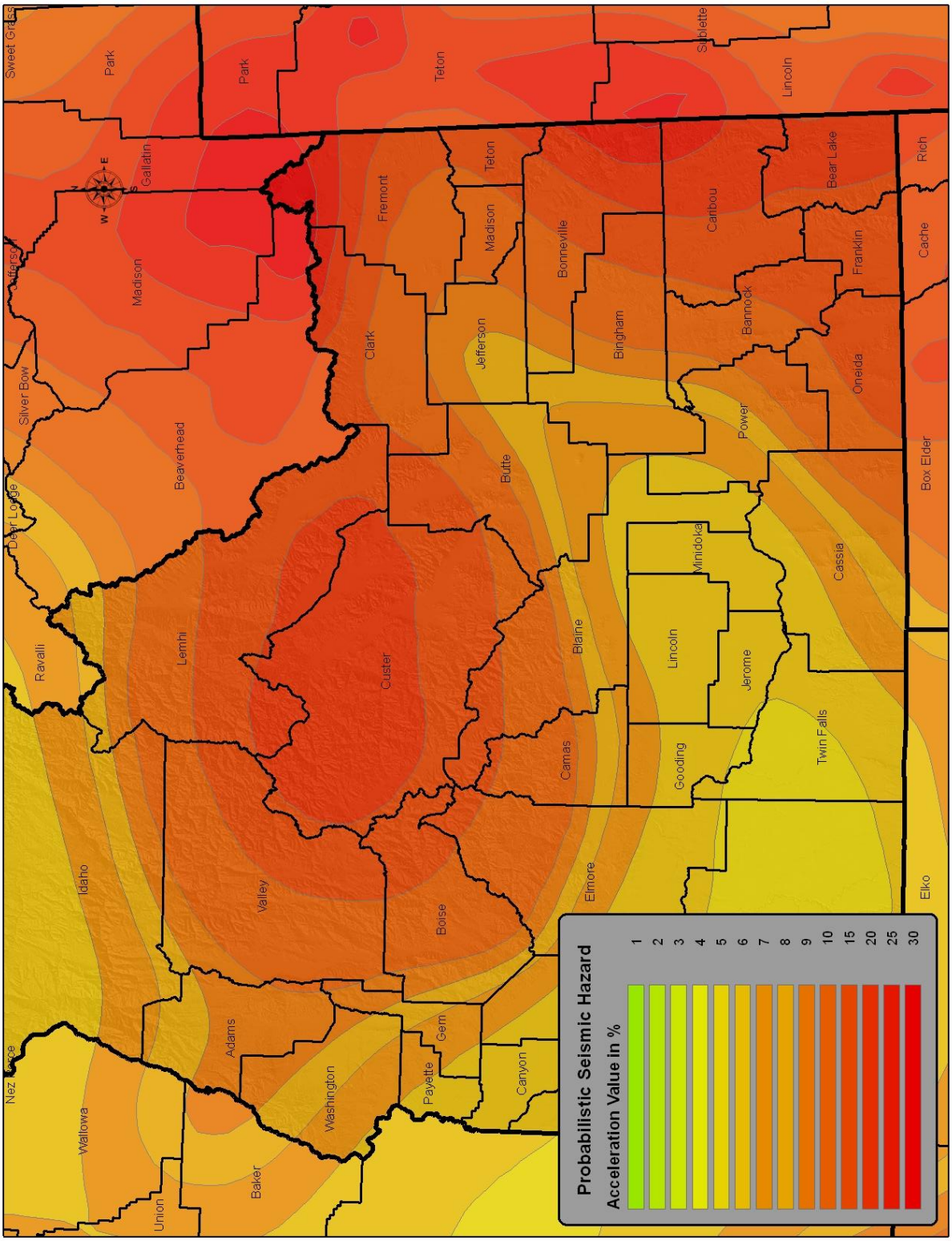


Figure 4.3.1
Probabilistic Seismic Hazards Map

Historical Frequencies

Historical data indicates that no earthquakes where the epicenter was within Twin Falls County have occurred in the last 58 years. There have, however, been reports of ground shaking in the County from earthquakes with their epicenters in surrounding areas. One such earthquake was the Shoshone earthquake that occurred on November 11, 1905. The epicenter was located about 5 miles SW of Shoshone, ID, which is located about 30 miles North of the city of Twin Falls. The shaking was felt as far away as Salt Lake City, Utah and Boise, Idaho.[25]

The most recent earthquake that was felt in Twin Falls County was the Wells, Nevada earthquake at 6:16 a.m. (PST) on February 21, 2008. The earthquake had a moment magnitude 6.0 (a "strong" earthquake) and the epicenter was about 5.5 miles (9 km) to the northeast of Wells, Nevada. Rupture of the earthquake fault was partly towards Wells and likely came much closer to this community than this distance indicates. The shaking was very severe in town and was more of a rolling motion a few miles south of Interstate 80. There were no immediate foreshocks recorded before the event. A small earthquake swarm with magnitude 3.7 and 3.1 events had occurred on February 28, 2007 in the same area as the 2008 Wells Earthquake. The Wells Earthquake was a normal dip-slip event.

Shaking occurred from this event in Twin Falls County. According to USGS documents shaking of an intensity of IV on the Mercalli scale was felt in Castleford, Filer, Hansen, and Twin Falls City. Shaking of intensity V was felt in Rogerson, and Shaking of intensity III was felt in Buhl[26].

By its nature, earthquake poses a county-wide hazard. USGS data identifies active faults in and around Twin Falls County. This complex of faults forms the northwest-trending border between the Tertiary volcanic rocks of the Owyhee Mountains and the Snake River Plain in southwestern Idaho. Most of the faults mapped in this zone offset volcanic rocks of probable late Tertiary age, but many of these rock units are poorly dated and thus may include some Quaternary units. A few faults along the Owyhee Mountains fault system offset Quaternary surficial deposits in the area between Shoofly Creek and Little Jacks Creek; these deposits are undated, but are probably late Quaternary in age. Scarp profiling, trenching, and detailed soils analysis of faults and deposits in the Shoofly/Little Jacks Creek area suggest latest Quaternary displacements on some of these faults. These and other data and conclusions are used to develop the recurrence interval and loss estimates given below.

Potential earthquake severity is evaluated using seismic hazard acceleration values on a scale of one (1) to one hundred (100), with 100 being the most severe. Data from the USGS "National Atlas - Seismic Hazard Acceleration Values" map, in figure 4.3.1 shows that the County is in Acceleration Zones 5-7 indicating relatively low earthquake severity potential. Further, USGS studies estimate a relatively long recurrence interval for one

[25] University of Utah Seismograph Stations.
http://www.seis.utah.edu/lqthreat/nehrp_htm/1905shos/1905sh1.shtml
[26] USGS. http://earthquake.usgs.gov/eqcenter/eqinthenews/2008/us2008nsa9/#summary

representative fault affecting Twin Falls County of between 3,000 and 9,000 years with an average recurrence interval for the last five events of 5,200 years.

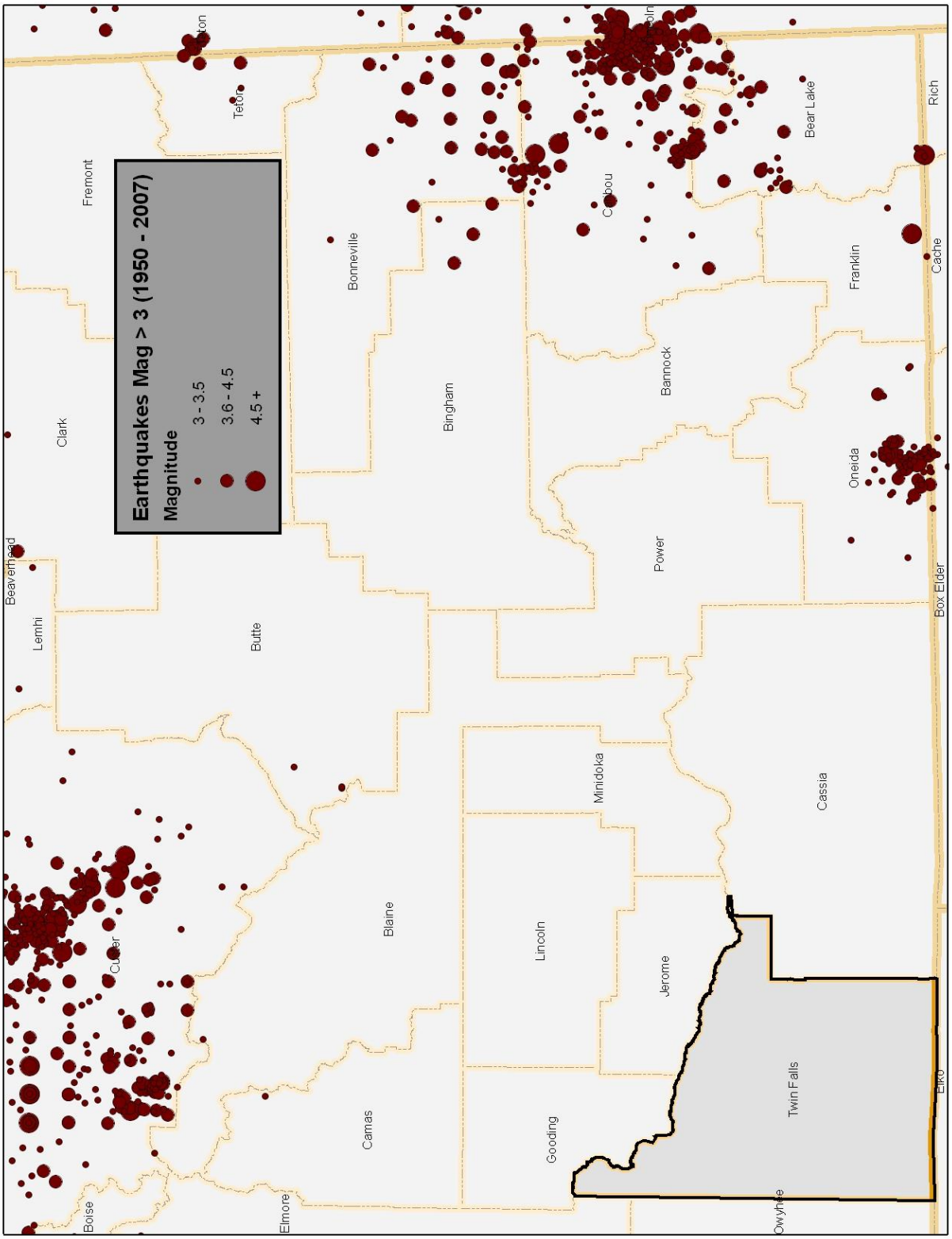


Figure 4.3.2
Historic Earthquakes

Impacts

Earthquakes are capable of catastrophic consequences, especially in urban areas. Worldwide, earthquakes have been known to cost thousands of lives and enormous economic and social losses. In minor earthquakes, damage may be done only to household goods, merchandise, and other building contents and people are occasionally injured or killed by falling objects. More violent earthquakes may cause the full or partial collapse of buildings, bridges and overpasses, and other structures. Fires due to broken gas lines, downed power lines, and other sources are common following an earthquake and often account for much of the damage. Economic losses arise from destruction of structures and infrastructure, interruption of business activity, and innumerable other sources. Utilities may be lost for long periods of time and all modes of transportation may be disrupted. Disaster Services including medical may be both disabled and overwhelmed. In addition to broken gas lines, other hazardous materials may be released.

Loss Estimates

As recommended by FEMA guidance for plan preparation, HAZUS earthquake analyses were conducted for both a magnitude 5.0 and a magnitude 7.0 earthquake event. The HAZUS methodology takes into account factors including:

- Known fault locations
- Seismic hazard acceleration zones
- Soil types
- Probability of occurrence (in eight increments ranging from the probability of occurrence within 100 years to the probability of occurrence within 2,500 years)
- Affected area assets and asset values (as presented in Table 4.6.1 in the Vulnerabilities section).
- Indirect losses such as business interruption and temporary living expenses.

The HAZUS reports show very similar results for magnitude 5.0 and magnitude 7.0 because the greater severity of the latter is offset in the analysis by its much lower probability of occurrence in any 100 year period. Details of the loss estimates indicate that the most severe damage would occur in the northern portions of Twin Falls City and along the Snake River Canyon rim. Economic loss results by census tract are summarized in Tables 4.3.1 and 4.3.2 using values from the 2000 U.S. Census.

Census Tract	Estimated Loss*
1	28
2	143
3	220
4	286
5	220
6	131
7	563
8	544
9	596
10	581
11	511
12	238
13	281
14	56
TOTAL	4,398
**Loss estimated in Thousands of Dollars*	

Table 4.3.1
Loss Estimates for Magnitude 5.0, 100 Year Earthquake

Census Tract	Loss Estimate*
1	71
2	283
3	604
4	487
5	521
6	325
7	921
8	753
9	1,275
10	884
11	390
12	539
13	679
14	139
TOTAL	7,870
**Loss estimated in Thousands of Dollars*	

Table 4.3.2
Loss Estimates for Magnitude 7.0, 100 Year
Earthquake

Using the HAZUS, analysis loss estimates were updated using 2007 Twin Falls County assessed valuations. The following information was derived:

Residential Parcels impacted – 24,662

Total Parcels impacted – 37,721

Total number of residents impacted – 61,655

Maximum Value of single impacted Parcel - $4,103,670

Total property value in impact area - $1,240,000,122

Casualty estimates for the worst-case scenario (a magnitude 7.0 earthquake occurring at 2:00 AM) are shown in Table 4.3.3.

Severity Level*	Number of Casualties
1	3
2	0
3	0
4	0

* Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
Severity Level 4: Victims are killed by the earthquake.

Table 4.3.3
Casualty estimates for magnitude 7.0 earthquake at 2:00 AM

Hazard Evaluation

While the possibility of an earthquake in Twin Falls County exists, HAZUS loss estimates indicate that the risk is low. Moderate damage to only 179 buildings is projected with little or no debris and no fires. This represents less than 1% of the total number of buildings in the County and less than 0.3% of their replacement value for the worst-case scenario (magnitude 7.0, 100 year earthquake). Casualties would also be very limited with no deaths and only three minor injuries in the worst-case scenario. It should be understood that a magnitude 7.0 earthquake would be expected to have extensive impacts. The relatively low HAZUS loss estimates for magnitude 7.0 arise because of the low probability that such an earthquake will occur.

Repetitive Loss - none

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

Earthquake has a magnitude score of 28

	Frequency
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Magnitude/Frequency Scoring Rationale

Predictive methodology for earthquakes is not capable of providing warning for specific events which usually occur suddenly, with no warning (Warning Lead Times = 8). Earthquakes affect wide areas (Geography Affected = 8) but, in Twin Falls County, such an event is expected to cause some injuries and no deaths (Bodily Harm = 2). Some structural and infrastructure damage is possible in the event of a strong earthquake, interrupting business activities and requiring some reconstruction (Economic Loss = 2). Recovery assistance at the Federal level might be required (Reconstruction Assistance = 8). The total Magnitude score is, therefore, twenty-eight (28) which, for Twin Falls County, is in the "High" range. Historical records for earthquake are available and reliable, indicating that an earthquake has not occurred in the past twenty-five years in Twin Falls County (Frequency = Low).

Landslide/Mudslide

Description

The term "landslide" encompasses several types of occurrence (including mudslides) in which slope-forming materials such as rock and soil move downward under the influence of gravity. Such downward movement may occur as the result of an increase in the weight of slope-forming materials, an increase in the gradient (angle) of the slope, a decrease in the forces resisting downward motion (friction or material strength) or a combination of these factors. Factors that may trigger a landslide include: weather related events such as heavy rainfall (one of the most common contributors), erosion, and freeze-thaw weakening of geologic structures, human causes such as excavation and mining, deforestation, and vibration from explosions or other sources, and such geologic causes as earthquake, volcanic activity, and shearing or fissuring. The speed of descent ranges from sudden and rapid to an almost imperceptibly slow creep where effects are only observable over a period of months or years.

Historical Frequencies

June 27, 1913 – Landslide at Shoshone Falls caused by unusual flow of irrigation water over the rimrock above. The slide swept away trees and vegetation on the narrow draw leading to the riverbed. All access to canyon was cut off.

The Bluegill landslide is a large, naturally-occurring landslide located in south-central Idaho, approximately 22 miles west of Twin Falls and 6 miles west of Buhl. The landslide is predominantly on public land administered by the BLM, although portions of the landslide are on state and private property.

Bluegill is part of a larger landslide complex that forms an area in the Salmon Falls Creek drainage named Sinking Canyon. The last major landslide movements in Sinking Canyon occurred in the summer of 1937 when several acres of farmland were lost over a period of several days into the existing canyon. The 1937 event was likely a continuation of landslides that have occurred in this area since the inception of the canyon.

The most recent movement of the Bluegill landslide occurred in late 1998 or early 1999. Movement of the landslide was brought to the attention of BLM in 1999 when recreational rock climbers noted the formation and widening of fractures in the basalt cliffs that form the canyon rim.

Figure 4.3.3
Bluegill Landslide

Initial monitoring determined that about 11 acres of the canyon rim had moved over a period of several months to a year. These movements created a dam that forms a lake that is approximately

1 mile long and averages about 130 feet wide. The primary hazard currently associated with the landslide is a possible breach of the dam that could cause flooding downstream.

As part of ongoing efforts to address possible public safety concerns, the BLM, in coordination with the US Geological Survey (USGS), has conducted an assessment of the landslide, examined mitigation options, and identified alternatives for further study and monitoring of the landslide. To date, movement of the landslide is minimal and remains under observation by BLM and the USGS.

Figure 4.3.4 is a map produced by the Idaho Geologic Survey which shows where landslides have generated distinctive deposits and landforms in the Hagerman Quadrangle, which includes the northwestern corner of Twin Falls County. Landslide deposits are prominent along the Snake River Canyon Rim. Additionally Figure 4.3.5 indicates landslides have occurred in areas west of Twin Falls City.

Impacts

Some of the many direct and indirect impacts of landslides are:

- Human and animal deaths and injuries and resulting productivity losses
- Damage or destruction of structures
- Destruction or blockage of roadways and resulting transportation interruption
- Loss of, or reduced land usage
- Loss of industrial, agricultural and forest productivity
- Reduced property values in areas threatened by landslide
- Loss of tourist revenues and recreational opportunities
- Damage or destroyed infrastructure and utilities
- Damming or alteration of the course of streams and resulting flooding
- Reduced water quality

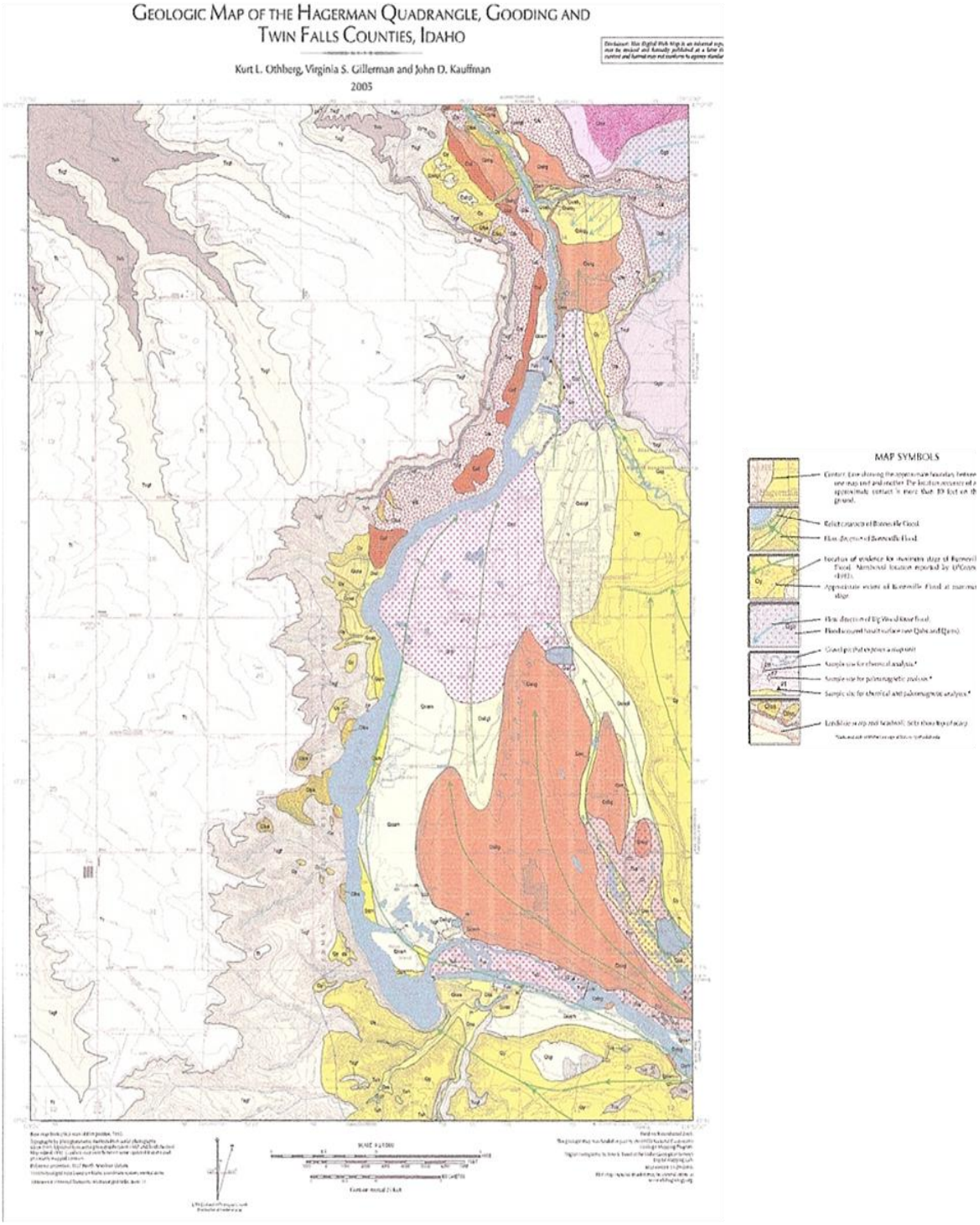


Figure 4.3.4
Geologic Map of the Hagerman
Quadrangle Gooding and Twin Falls
Counties Idaho

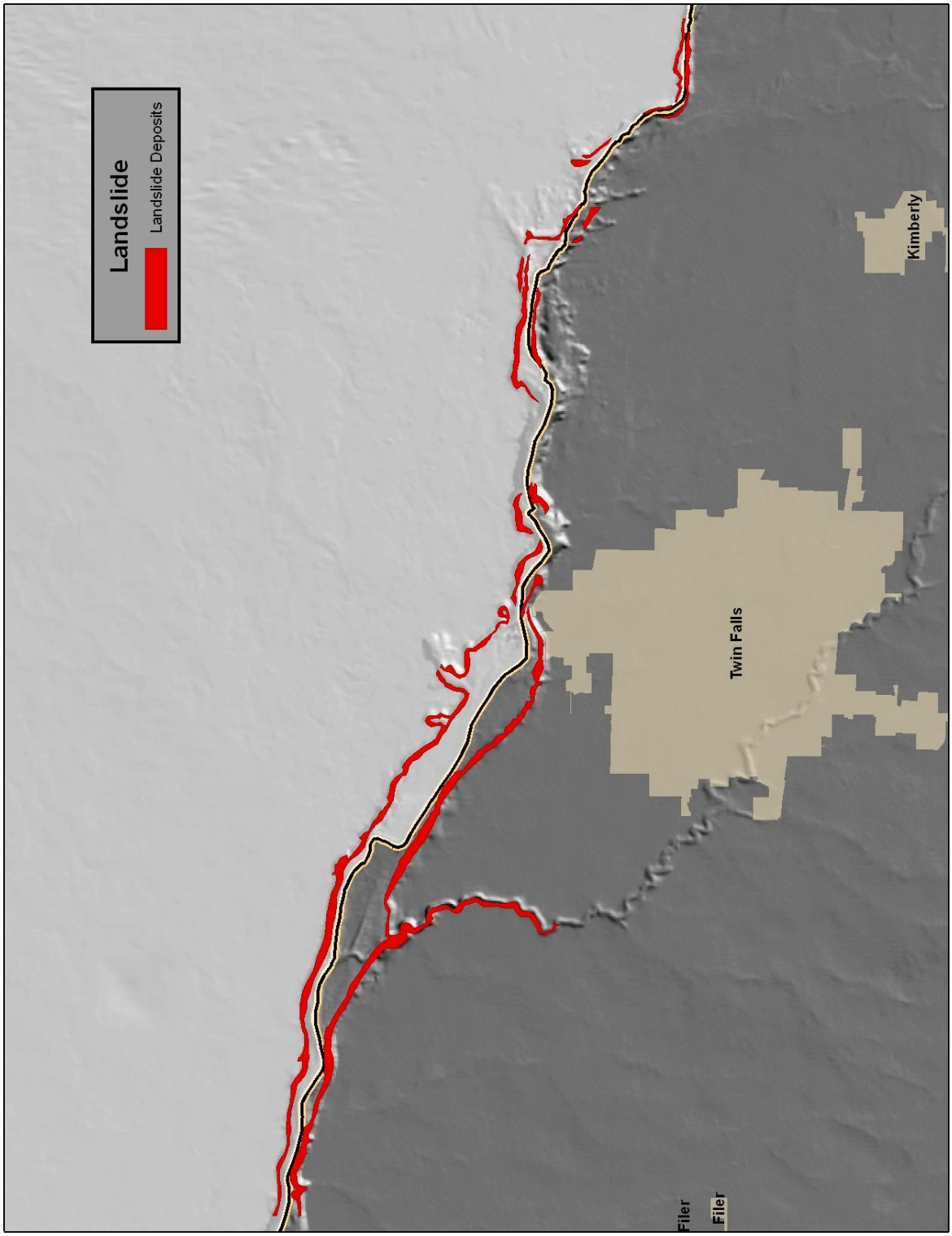


Figure 4.3.5
Landslide deposits near Twin Falls City.

Loss Estimates

Potential losses due to landslides in Twin Falls County are difficult to calculate because the most landslide prone areas in Twin Falls County are in areas where this little loss exposure. One critical area in the Snake River Canyon wall rockslides adjacent to the City of Twin Falls domestic water well and the City's sewage treatment facilities. Protection of those facilities from potential losses is critical.

Figure 4.3.6
Twin Fall County exposed water line

Damage to the domestic water line for the City of Twin Falls could be as high as $643,837 and to the sewer line $896,052.

Hazard Evaluation

Landslide and Rockslide risks are significant along the Snake River Canyon rim. Historical evidence indicates that rocks have fractured along the canyon walls and slid into the canyon. Infrastructure has been built on top of and below some of these historic slide areas. Engineering studies indicate that rock fractures occur when water runs behind the rocks and freezes, expanding fractures and increasing the potential for slides.

Repetitive Loss – Even though rock slides are frequent along the Snake River Canyon rim there is no repetitive damage or loss as the slides are spread out over several miles.

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

Landslide has a magnitude score of 11

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Magnitude/Frequency Scoring Rationale

Conditions leading to landslide/mudslide may develop quickly, providing little warning time (Warning Lead Times = 4). Vulnerabilities in Twin Falls County are minimal (Geography Affected = 2) and there is little potential for death or injury (Bodily Harm = 1) and economic loss would be limited (Economic Loss = 2). Any necessary recovery would be managed at the County level (Reconstruction Assistance = 2). The total Magnitude score is, therefore, eleven (11) which, for Twin Falls County, is in the "Low" range. Historical records for landslide/mudslide are available and reliable, indicating that no significant events have occurred in Twin Falls County. The potential map, however, indicates at least a moderate likelihood (Frequency = Medium).

Section 4.4 Other Natural Hazards

Wildfire

Description

Wildfire is defined by the USDA Forest Service as, "A fire naturally caused or caused by humans, that is not meeting land management objectives."[27] It is generally thought of as an uncontrolled fire involving vegetative fuels occurring in wildland areas. Such fires are classified for hazard analysis purposes as either "Wildland" or "Wildland Urban Interface" (WUI) fires. Wildland fires occur in areas that are undeveloped except for the presence of roads, railroads and power lines while WUI fires occur where structures or other human development meets or is intermingled with the wildland or vegetative fuels. Wildland fire is currently considered a natural and necessary component of wildland ecology and, as such, is most often allowed to progress to the extent that it does not threaten inhabited areas or human interests and well-being. At the wildland urban interface, vigorous attempts are made to control fires but this becomes an increasingly difficult challenge as more and more development for recreational and living purposes takes place in wildland areas. Some wildland fires are ignited naturally (almost exclusively by lightning) but most ignitions are a result of human activities, either careless or intentional. The rapidity with which a wildland fire spreads and the intensity with which it burns is controlled by a number of factors including:

- Weather - wind speed and direction, temperature, precipitation
- Terrain – fires burn most rapidly upslope
- Type of vegetation
- Condition of vegetation - dryness
- Fuel load – the amount and density of vegetation
- Human attempts to suppress

Historical Fire Events

Although their remote location has hindered accurate documentation, a one hundred year analysis of historical reports indicates the occurrence of several wildland fires in Twin Falls County during that time frame[28]. The Sawtooth National Forest Service and the Bureau of Land Management have collected data on wildfires occurring in the area since 1950. This data indicates that in this period within Twin Falls County approximately 663,000 acres have burned during large fire events.[29]

A breakdown of the sizes of these fires is given in Table 4.4.1 and Table 4.4.2 lists the eight largest fires in this period.

[27] http://www.fs.fed.us/fire/fireuse/education/terms/fire_terms_pg5.html
[28] Twin Falls County WUI Fire Mitigation Plan, p 45
[29] Twin Falls County WUI Fire Mitigation Plan, p 40

Large Fires	Approximate Acres Burned
53	200
15	500
13	1,000
4	2,000
11	>10,000

Table 4.4.1
Size of Twin Falls County Wildfires Since 1950

Year	Acres Burned
1976	146,980
1990	15,577
1995	30,797
1995	19,264
1995	15,759
1996	24,527
1999	35,042
2000	36,383

Table 4.4.2
Largest Twin Falls County Wildfires Since 1950

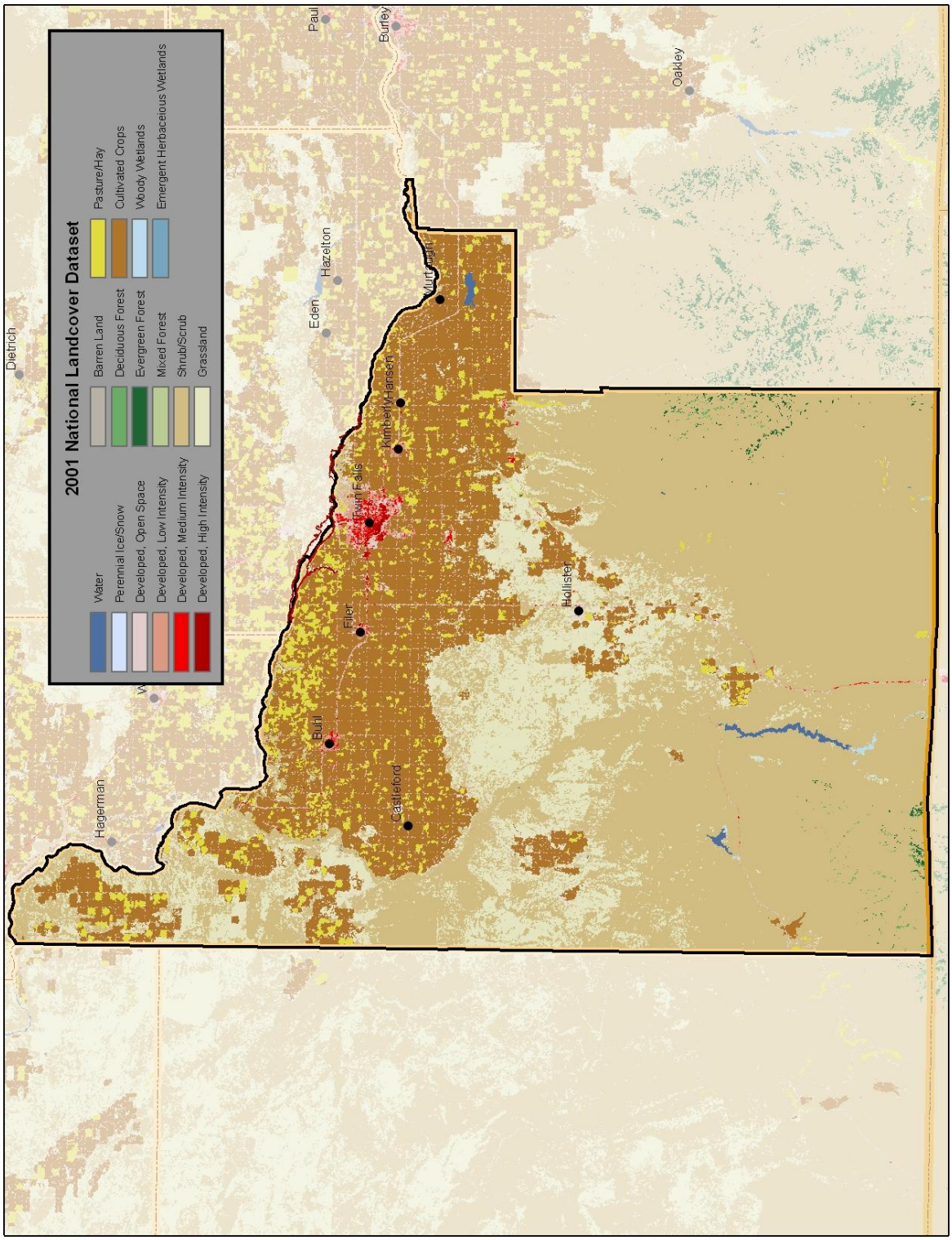


Figure 4.4.1
Wildfire Hazard by Fuel Load and Type

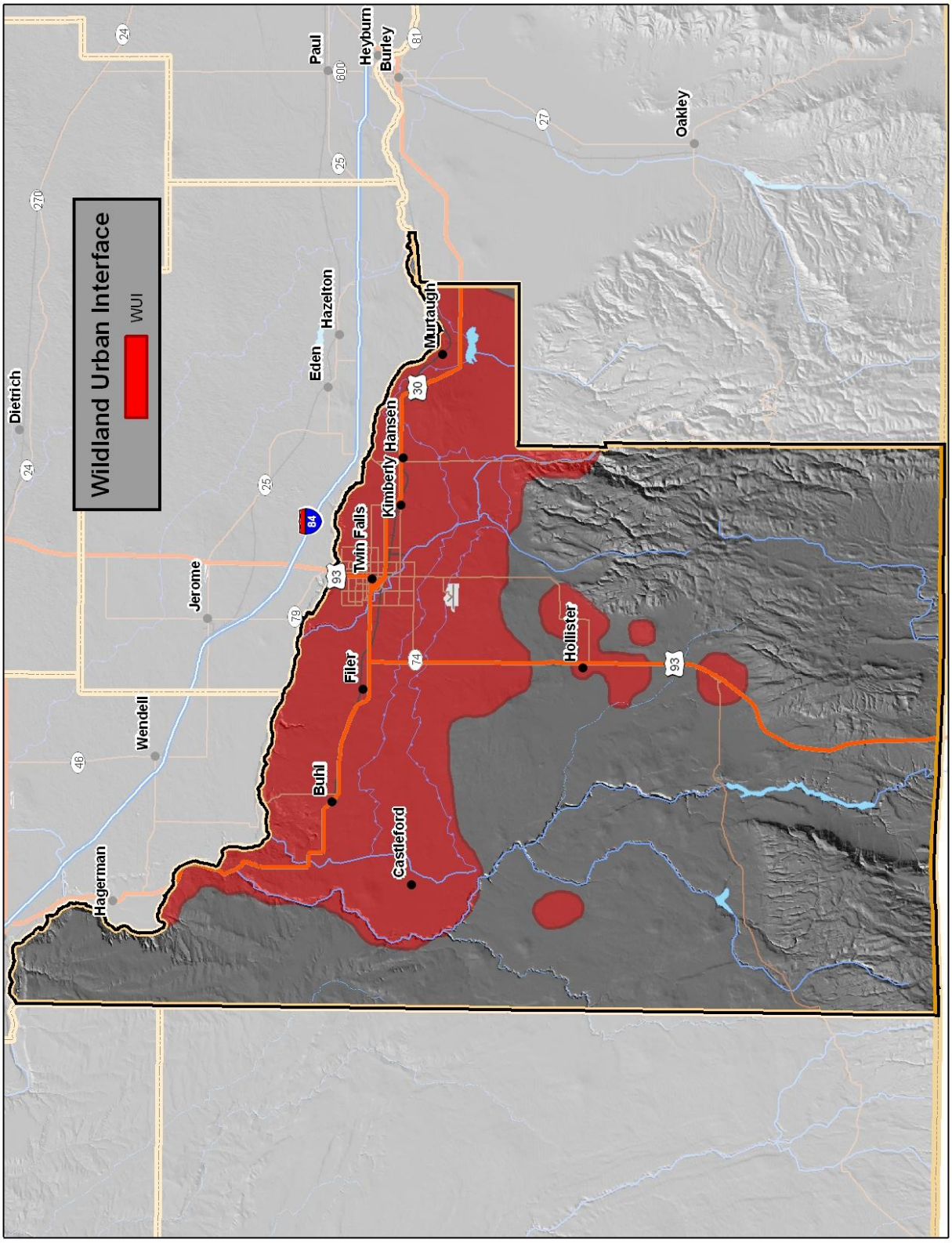
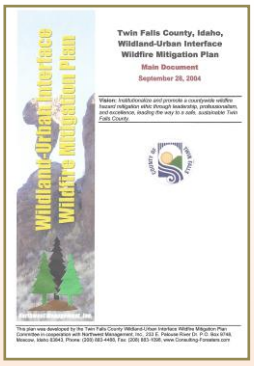


Figure 4.4.2
Twin Falls County Wildland Urban Interface Map

In the Twin Falls County Wildland Urban Interface Plan, areas of highest hazard were compared with the location of exposed residences and other facilities. This comparison indicates that areas of highest risk are:

- Mellon Valley – Carter Pack Road Area
- Banbury Hidden Landing Area
- Southwest Corner of the Filer Fire District
- Snake River Canyon Rim
- West of Twin Falls including
  - Rock Creek Estates
  - Rock Creek Point
  - Village at Canyon Gate
  - Canyon Trails
- East of Twin Falls including
  - East Poleline Road, Canyon Ridge and Meadow Ridge
  - Dierkes Lake and Hidden Lake
  - Rock Creek Park and Rock Creek Parkway
  - Centennial Park and Snake River Canyon Trail
- The Community of Rock Creek
- China Ridge-Hidden Lakes
- Pleasant Valley
- Cottonwood Heights and Parrot Crossing
- The Community of Hollister
- The Community of Rogerson
- Hannahs Fork of Big Creek
- Communities outside Rural Fire Protection Districts.



Note: *The 2004 Twin Falls County Wildland Urban Interface Fire Mitigation Plan is hereby incorporated in part by reference and through inclusion of the summary information provided within this hazard profile.*

Roseworth, Bell Rapids, Three Creek and Magic Water areas are populated areas that are not currently served by rural fire protection. All of these areas are quite rural with homes and outbuildings generally associated with the large farms in the area. The lack of structural fire protection in these areas increases risk associated with both structural and wildland fire. The Lower Snake River District of the BLM does provide wildland fire protection but does not provide protection for fires originating on private lands that may threaten homes and property.[30]

As demonstrated in figure 4.4.2 the following cities are located within the Wildland Urban Interface:

- Buhl
- Castleford
- Filer
- Hansen
- Hollister

[30] Twin Falls County WUI Fire Mitigation Plan, p 94

- Kimberly
- Murtaugh
- Twin Falls City

Impact

Wildland fires threaten the lives of anyone in their path including hikers, campers and other recreational users and, where suppression efforts are made, firefighters. Enormous volumes of smoke and airborne particulate materials are produced that can affect the health of persons for many miles downwind. Nearer to the fire, smoke reduces visibility, disrupting traffic and increasing the likelihood of highway accidents. As a result of wildland fire there may be changes in water quality in the area and erosion rates may increase along with increased rainfall runoff and flash flood threat, and decreased rainfall interception and infiltration. Indirect impacts include losses to tourism, recreational and timber interests and loss of wildlife habitat. Wildland Urban Interface fires have most or all of the above impacts as well as those of structural fires including injury and loss of life, loss of structures and contents. Agricultural losses may also be sustained including livestock, crops, fencing and equipment.

Loss Estimates

Economic loss results for areas of high wildfire hazard are summarized in Table 4.4.3

Hazard Area	Potential Property Losses
Melon Valley – Carter Pack Road Area	$8,498,201
Banbury Hidden Landing Area	$1,933,188
Southwest Corner of the Filer Fire District	$4,166,048
Snake River Canyon Rim	$61,808,685
- and Hidden Lake	$14,662,549
- Rock Creek Park and Rock Creek Parkway	$43,214,718
The Community of Rock Creek	$2,077,010
Pleasant Valley	$11,364,185
The City of Hollister	$2,487,783
The Community of Rogerson	$714,675
Hannahs Fork of Big Creek	$488,223
Communities outside Rural Fire Protection Districts	$94,157,288

Table 4.4.3
Loss Estimates for Wildfire in High Hazard Areas

The potential total loss of Twin Falls County from a catastrophic wildfire defined as a wildfire that consumes all property within the defined Wildland Urban Interface Area yields the following:

Residential parcels impacted – 24,576

Total parcels impacted – 37,721

Maximum value of a single impacted parcel - $4,103,670

Total Value of Property in the WUI Area - $1,219,382,497

Hazard Evaluation

Repetitive Loss - none

There is an average of about five wildfires per year in Twin Falls County and historical evidence shows that the potential for very large wildfires exists. The fuel types and loads present in the County make possible, given adverse weather conditions, wildfire events that would overwhelm any suppression efforts using current resources. In such an event, it is probable that large economic losses would be suffered; injury and loss of life is also possible.

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

Wildfire has a magnitude score of 20

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Magnitude/Frequency Scoring Rationale

Wildfires often develop rapidly and provide little warning (Warning Lead Times = 8). Relatively extensive areas in Twin Falls County are vulnerable to wildfire (Geography Affected = 4) but because these areas are remote, minimal deaths or and injuries are expected (Bodily Harm = 2). The Twin Falls County economy is minimally vulnerable to wildfire unless the wildfires enter into Crop Lands (Economic Loss = 2) and State recovery assistance might be required (Reconstruction Assistance = 4). The total Magnitude score is, therefore, twenty (20) which, for Twin Falls County, is in the "High" range. Historical records are available and reliable, indicating that wildfires occur relatively frequently in the County (Frequency = High).

Biological

Epidemic/Pandemic

Description

Epidemic is defined as a disease that appears as new cases in the human population at a rate, during a given time period and location, that substantially exceeds the number expected. It is, thus, a relative term and there is no quantitative criterion for designating a health crisis as an epidemic. In addition to its application to infectious diseases, the term is sometimes used to describe outbreaks of other adverse health effects including those stemming from chemical exposure, sociological problems, and psychological disorders. A "pandemic" is a worldwide epidemic while the term "outbreak" may be applied to more geographically limited medical problem as, for instance, in a single community rather than statewide or nationwide. The term "cluster" is often used with reference to non-communicable diseases.

Three factors combine to produce an epidemic: an "agent" that causes the disease, a "host" that is susceptible to the disease, and an "environment" that permits the host to be exposed to the agent. The spread of an infectious disease depends on the chain of transmission: a source of the agent, a route of exit from the host, a mode of transmission between the susceptible host and the source, and a route of entry into another susceptible host. Modes of spread may involve direct physical contact between the infected host and the new host, or airborne spread, such as coughing or sneezing. Indirect transmission takes place through vehicles such as contaminated water, food, or intravenous fluids; inanimate objects such as bedding, clothes, or surgical instruments; or a biological vector such as a mosquito or flea.

Health agencies closely monitor for diseases with the potential to cause an epidemic and seek to develop immunizations and eliminate vectors. While this effort has been remarkably successful, there are many diseases of concern and the HIV/AIDS pandemic is still not controlled despite more than 25 years of effort since recognition of the disease in 1981.

Pandemic influenza versus regular influenza season

A flu pandemic has little or nothing in common with the annual flu season. A pandemic flu would be a new strain and a much more serious and contagious flu virus. Humans would have no natural resistance to a new strain of influenza. Also, there is a vaccine for seasonal flu, but there is no vaccine available at this time for a pandemic flu. If a new, highly contagious strain of influenza begins to infect humans, it would likely cause widespread illness and death within a matter of months, and could last up to two years. The Centers for Disease Control and Prevention (CDC) predict that as much as 25% to 30% of the U.S. population could be sick, hospitalized, and many may die as a result of severe illness.

South Central Public Health District (SCPHD) is currently working on a plan to limit the spread of a pandemic influenza and to maintain essential health care and community services if an outbreak should occur. In fact, governments all around the world are preparing for the possibility of a pandemic outbreak. Even so, it may not be possible to prevent or

stop a pandemic once it begins to spread easily from person-to-person. A person infected with influenza can be contagious for 24 hours before symptoms may appear and for seven days thereafter, making it extremely easy for the virus to infect large numbers of people.

Although the Federal government is stockpiling large quantities of medical supplies and antiviral drugs, no country in the world has enough anti-virals to protect their citizens. Anti-virals would be used to treat severe cases as long as there was a reasonable chance that the drugs might help save lives. Anti-virals might also be reserved for people who work in areas that place them at high risk for exposure in an outbreak, such as health care workers.

Other strategies for slowing the spread of a potentially deadly pandemic influenza virus could include temporarily closing schools, sports arenas, theaters, restaurants, taverns, and other public gathering places and facilities.

There currently is no vaccine to protect humans against a pandemic influenza virus but vaccine development efforts are under way to protect humans against the current H5N1 bird flu virus.

Pandemic Flu

H5N1 "Bird Flu"

The possibility that bird flu virus may mutate into a new form of human flu that would be easily spread person to person is of greatest concern. Some migratory waterfowl carry the H5N1 virus with no apparent harm, but transmit the virus to susceptible domestic poultry. The highly lethal H5N1 outbreak among domestic poultry is widespread and uncontrolled and has directly infected a small number of humans. People who have close contact with infected birds or surfaces that have been contaminated with droppings from infected birds are at risk of becoming infected themselves.

Historical studies indicate that poultry consumption in infected areas is not a risk factor, provided the food was thoroughly cooked and the person was not involved in food preparation. Simply traveling to a country with ongoing outbreaks in poultry or sporadic human cases does not place a traveler at increased risk of infection, provided the person does not visit live poultry markets, farms or other environments where exposure to diseased birds may occur. More than 200 million birds in affected countries have either died from the disease or were killed in order to try to control the outbreak.

Many Asian countries are currently dealing with bird flu outbreaks including Cambodia, China, Indonesia, Japan, Laos, South Korea, Thailand, and Vietnam. Bird flu continues to spread geographically from its original focus in Asia. Further spread of the virus along migratory routes of wild water fowl is anticipated. So far, there has been no sustained person-to-person spread of the disease. However, a few isolated cases of possible human-to-human spread between family members are currently under investigation.

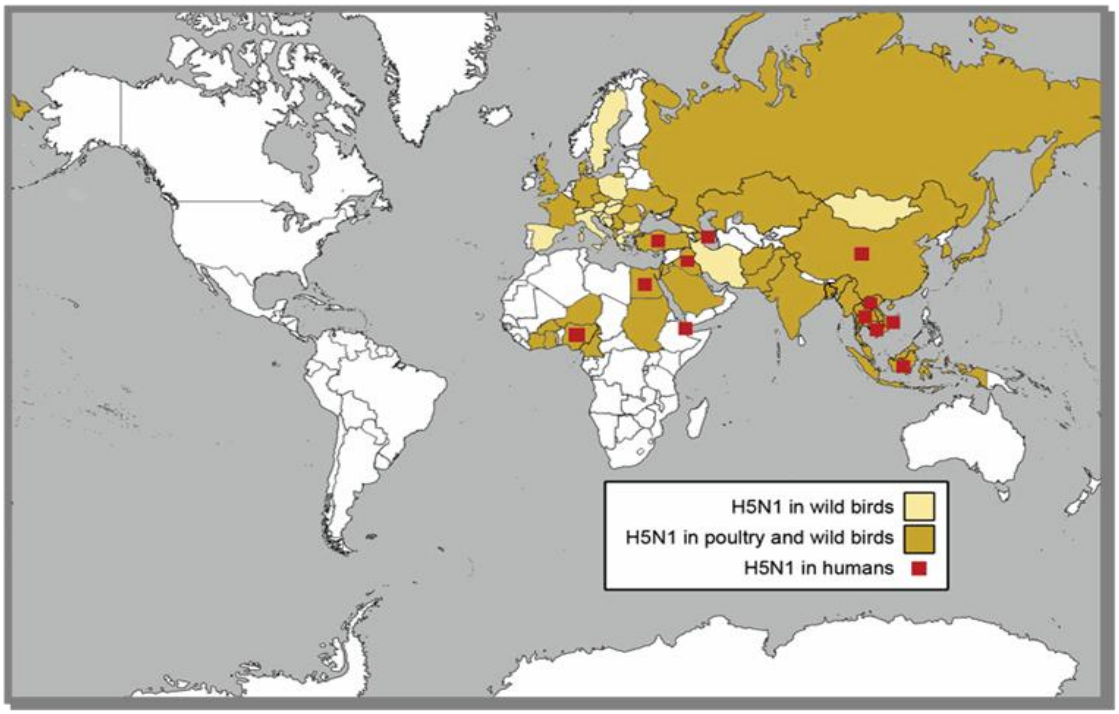


Figure 4.4.3
Bird Flu Outbreaks Worldwide

The reported symptoms of bird flu in humans range from typical influenza-like symptoms (e.g., fever, cough, sore throat, and muscle aches), to eye infections (conjunctivitis), pneumonia, acute respiratory distress, viral pneumonia, and other severe and life threatening complications. Diarrhea, vomiting, abdominal pain, chest pain, and bleeding from the nose and gums have also been reported as early symptoms in some cases. In many cases, health deteriorates rapidly leading to a high percentage of death in those infected.

Severe Acute Respiratory Syndrome (SARS)

Severe acute respiratory syndrome (SARS) is a viral respiratory illness caused by a coronavirus, called SARS-associated coronavirus (SARS-CoV). SARS was first reported in Asia in February 2003. Over the next few months, the illness spread to more than two dozen countries in North America, South America, Europe, and Asia before the SARS global outbreak of 2003 was contained.

According to the World Health Organization (WHO), a total of 8,098 people worldwide became sick with SARS during the 2003 outbreak. Of these, 774 died. In the United States, only eight people had laboratory evidence of SARS-CoV infection. All of these people had traveled to other parts of the world with SARS. SARS did not spread more widely in the community in the United States.

In general, SARS begins with a high fever (temperature greater than 100.4°F [>38.0°C]). Other symptoms may include headache, an overall feeling of discomfort, and body aches. Some people also have mild respiratory symptoms at the outset. About 10 percent to 20

percent of patients have diarrhea. After 2 to 7 days, SARS patients may develop a dry cough. Most patients develop pneumonia.

The main way that SARS seems to spread is by close person-to-person contact. The virus that causes SARS is thought to be transmitted most readily by respiratory droplets (droplet spread) produced when an infected person coughs or sneezes. Droplet spread can happen when droplets from the cough or sneeze of an infected person are propelled a short distance (generally up to 3 feet) through the air and deposited on the mucous membranes of the mouth, nose, or eyes of persons who are nearby. The virus also can spread when a person touches a surface or object contaminated with infectious droplets and then touches his or her mouth, nose, or eye(s). In addition, it is possible that the SARS virus might spread more broadly through the air (airborne spread) or by other ways that are not now known.

Historic Frequencies

The 1918 -1920 Spanish Flu:

The first cases Spanish Flu were reported in Canyon County (northwest of Boise) on September 30, 1918. Within three weeks, the disease was raging all across the State. The numbers of deaths in the State and in Bannock County are unknown but it is estimated that 675,000 Americans died during the epidemic and that 20 to 40 million died worldwide.

Asian Flu 1957 -1958:

First identified in China, this virus caused roughly 70,000 deaths in the United States during the 1957-58 seasons. Because this strain has not circulated in humans since 1968, no one under 30 years old has immunity to this strain.

Hong Kong Flu 1968-1969:

This flu first detected in Hong Kong in early 1968, spread to the United States later that year. The Hong Kong Flu killed about 34,000 people in the United States and one million people worldwide.

Impacts

Characteristics and Impacts of a pandemic

- Rapid Worldwide Spread
- Health Care Systems Overloaded
- Medical Supplies Inadequate
- Economic and Social Disruption

Loss Estimates

Historically, epidemics have claimed far more lives than any other type of disaster. While modern epidemiology and medical advances make the decimation of populations much less likely, new forms of disease continue to appear. The potential, therefore, exists for epidemic to cause widespread loss of life and disability, overwhelm medical resources and have tremendous economic impacts.

Hazard Evaluation

Repetitive Loss - none

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

Epidemic has a magnitude score of 19

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Magnitude/Frequency Scoring Rationale

Pandemic and epidemics develop relatively slowly, usually providing at least weeks of warning (Warning Lead Times = 2). When pandemic/epidemic does occur, wide geographical areas are affected (Geography Affected = 8) and deaths and injuries are likely to occur (Bodily Harm = 4). Business interruption and some economic loss are likely (Economic Loss = 4) but recovery is left to individuals and families (Reconstruction Assistance = 1). The total Magnitude score is, therefore, nineteen (19) which, for Twin Falls County, is in the "High" range. Historical records for pandemic/epidemic are available and reliable, indicating that such events are rare (Frequency = Low).

West Nile Virus

Description

West Nile virus (WNV) is transmitted to people, birds and other animals by the bite of an infected mosquito. This virus can cause serious illness in people of any age, but

especially in people over the age of fifty or those with other underlying medical conditions. The best form of protection is by avoiding mosquito bites.

West Nile virus infections occur in the summer and fall in Idaho when mosquitoes are active. WNV does not occur in northern states when it is too cool for mosquitoes to survive. In southern states with warmer climates and mosquitoes present year-round, the risk of infection may still be present in the winter months.

Historical Frequencies

Locally-acquired mosquito-borne human infections were first recorded in Idaho in 2004. In 2006, Idaho led the nation in reports of human illness associated with WNV with 996 cases being reported to the State Health Department. In addition to people, WNV was also detected in 338 horses, 127 birds and numerous mosquitoes.

Date	Human	Horse	Bird	Mosquitoes
2004	0	1	0	
2005	1	1	0	
2006	39	22	11	Not Tested
2007	3	0	0	Positive

Table 4.4.4
Reported Cases of WNV in Twin Falls County
Source: http://www.healthandwelfare.idaho.gov/site/4278/default.aspx

Impacts

Symptoms of West Nile virus may include a fever, headache, body aches, a rash and swollen glands and may last for days or linger for weeks to months. Serious illness infecting the brain or spinal cord can occur in some individuals. Although anyone can experience the more severe form of the disease, it tends to occur in people over the age of 50 or those with other underlying medical conditions or weakened immune systems. The severe symptoms may include high fever, headache, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, vision loss, numbness and paralysis. These symptoms may last several weeks or more, and neurological effects may be permanent. Usually, symptoms occur from five to fifteen days after the bite of an infected mosquito. There is no specific treatment for infection, but hospitalization and treatment of symptoms may improve the chances of recovery for severe infections. There is no vaccine available for humans.

Loss Estimates

Losses in the event of a West Nile virus outbreak would primarily be loss of income for those affected by the virus as well as a loss of productivity by businesses. Both human and animal deaths have occurred in Idaho due to West Nile virus.

Hazard Evaluation

Repetitive Loss - none

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Potential Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering / Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

West Nile Virus has a magnitude score of 7.

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Magnitude/Frequency Scoring Rationale

Outbreaks of West Nile Virus, like other epidemics, develop relatively slowly, usually providing months of warning (Warning Lead Times = 1). When an outbreak does occur, wide geographical areas can be affected (Geography Affected = 2). Major medical care is required but few deaths are likely (Bodily Harm = 2). Little or no economic loss is likely (Economic Loss = 1) and recovery is left to individuals and families (Reconstruction Assistance = 1). The total Magnitude score is, therefore, seven (7) which, for Twin Falls County, is in the "Low" range. Historical records are available and reliable, indicating that instances of West Nile Virus occur yearly (Frequency = High).

Section 4.5 Technological (Manmade) Hazards

Structural Fire

Description

Structures in which fires may occur include the following occupancies: Residential, Non-residential, Educational, Health care, High-rise, and Public assembly. Major causes of structural fires differ in frequency depending on occupancy type but generally include:

- Incendiary/suspicious (arson)
- Heating (including alternative heat sources)
- Cooking
- Open flame (including welding)
- Electrical distribution
- Appliances
- Children playing
- Exposure to other fires

Structural fires produce high heat, toxic gases, and particulate material as smoke and soot. The heat produced or burning debris can, in turn, cause additional fires. Toxic gases and smoke are extreme hazards in the interior of burning structures and may also be a threat downwind of the structure. Where the building contents include toxic materials, the downwind threat can extend a mile or more. Burning structures may collapse injuring persons inside or nearby and floors or roofs may give way beneath those walking on them. Burning structures present electrical, explosion and flashover hazards, and partially burned structures may, themselves, be physical hazards even after the fire is extinguished.

Historical Frequencies

Structure fires are extremely common in Twin Falls County as they are across the nation. Table 4.5.1 summarizes structure fires in Twin Falls County during 2006. Note that not all departments in the County reported.

Structural Fire History of Twin Falls Fire Departments 2006			
Department Name	**Fire Calls**	**Total Calls**	**Loss**
Buhl FPD	102	214	$223,747
Castleford FD	0	0	None reported
Filer FD	39	132	None reported
Hansen City FD	3	9	None reported
Kimberly FD	9	31	$171,000
Rock Creek Rural Fire Dist	54	172	$319,050
Salmon Tract Rural FPD	0	0	None reported
Twin Falls FD	184	2,112	$1,870,407

Table 4.5.1 - Structural Fire History of Twin Falls Fire Departments 2006
Source: Fire in Idaho 2006 State Fire Marshal Annual Report

Structural Fires are a continuing hazard in Twin Falls County. Structural Fire may also be associated with other hazards, particularly earthquake. Wildland Fires contribute to the ongoing risk to structures in those areas identified within the Wildland Urban Interface area.[31]

Impacts

Indirect dollar losses, as is often the case, may be much larger than direct losses. Costs also include those for development and enforcement of fire codes and maintaining fire response capabilities. Firefighters are, additionally, at risk from such hazards as physical exhaustion and cardiac stresses, heat exhaustion or heat stroke, acute and chronic health effects from toxic exposures, hearing damage, and injuries from many sources.

Loss Estimates

The reported loss in Twin Falls County in 2006 is used as an example of the potential losses due to structure fires. The total reported loss in 2006 was $2,584,204. Note that not all departments reported monetary losses.

Hazard Evaluation

Repetitive Loss - none

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

Structure Fire has a magnitude score of 14

[31] Twin Falls County WUI Plan, pg 104

Magnitude/Frequency Scoring Rationale

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Structural fires develop rapidly with little or no warning (Warning Lead Times = 8). Structural fire almost invariable affects only one or a very few structures (Geography Affected = 1) but limited death and injury does occur (Bodily Harm = 2). Some economic loss occurs (Economic Loss = 2) but recovery is left to individuals and families (Reconstruction Assistance = 1). The total Magnitude score is, therefore, fourteen (14) which, for Twin Falls County, is in the "Medium" range. Historical records for are available and reliable, indicating that structural fires are relatively frequent (Frequency = High

Nuclear Event

Description

A "nuclear event" is defined as an incident involving a nuclear reaction; nuclear fission or nuclear fusion. Examples of nuclear events include nuclear weapons detonations, nuclear reactor incidents, and nuclear (fissile) material production, handling or transportation incidents. Such reactions release heat, radiation, and radioactive contamination in extremely large quantities relative to the amount of material reacting. A nuclear detonation as a part of an attack scenario is, perhaps, the ultimate technological disaster. The hazards of nuclear detonation are well-known and vividly described in FEMA publications[32]. They include shock wave, enormous heat, and the spread of fallout (radioactive contamination). Other nuclear events would not involve a nuclear blast, but still have the potential to produce widespread and long-term consequences as exemplified by the 1986 Chernobyl accident[33]. Of primary concern is the release of radioactive contamination in the form of airborne gases and particulate material. This radioactive material has the potential travel great distances and particulate material eventually is deposited in the environment and incorporated into the food chain. Such contamination may remain hazardous for many years. Direct radiation exposure is also a hazard in relatively close proximity to a nuclear event as is exposure to high thermal energy. Nuclear events are virtually always caused by intentional or unintentional human actions.

Historical Frequencies

There are no recorded nuclear events for Twin Falls County

Impacts

Radiation exposure may occur due to the spread of radioactive contamination. Radioactive contamination is material containing radioisotopes. When such material becomes airborne, it can reach human victims over long distances. When it does so, it may be deposited on clothing and skin, and may be internalized by inhalation, ingestion, skin absorption, or through skin breaks. Particularly when contamination is internal, the

[32] e.g. http://www.fema.gov/areyouready/nuclear_blast.shtm
[33] http://www.iaea.org/NewsCenter/Focus/Chernobyl/index.html

victim receives radiation exposure. Radiation exposure, whatever the source and depending on its type, intensity and duration, can cause acute and/or chronic health effects. Acute health effects are those that appear within a relative short time period – a few hours to a few days – and may include:

- Hair loss
- Skin burns
- Gastrointestinal damage leading to nausea, vomiting, diarrhea, dehydration and loss of appetite
- Decreased red and white blood cell and platelet production leading to infection, weakness and fatigue, and uncontrolled bleeding

Because radioactive contamination presents such hazards, it also can render an area and anything within it uninhabitable until it is removed or has lost its radioactivity through decay. Clean-up of contaminated areas, where it is possible at all, is difficult, costly, and may be hazardous to those carrying it out.

Loss Estimates

Indirect costs in such a situation would almost certainly exceed those of clean-up. In addition, because the stigma carried by radiation and radioactive with the general public, affected areas and persons may be shunned out of proportion with the actual hazard. In fact, the social and political impacts of a nuclear event may well greatly exceed any justifiable limits.

Hazard Evaluation

Twin Falls County does not have a current Nuclear Threat. Analysis of the Idaho National Laboratory's credible accidents does not include a scenario which poses a hazard to Twin Falls County. Twin Falls County does not have nuclear waste transportation routes within its borders.

Repetitive Loss - none

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Nuclear Event has a magnitude score of 20

Magnitude/Frequency Scoring Rationale

Nuclear events might arise under a number of scenarios providing different lead times but the most likely would provide at least hours of warning (Warning Lead Times = 4). Twin Falls County could not be affected by a fixed facility nuclear event (Geography Affected = 4) and deaths and injuries are possible from exposure of an improvised nuclear device. (Bodily Harm = 2). Business interruption and agricultural economic loss are would occur (Economic Loss = 2) and recovery assistance would be provided by the Federal Government (Reconstruction Assistance = 8). The total Magnitude score is, therefore, twenty (20) which, for Twin Falls County, is in the "High" range. No nuclear event has occurred in Twin Falls County and the likelihood of a recurrence is very low (Frequency = Low).

Hazardous Material Event

Description

Substances that, because of their chemical or physical characteristics, are hazardous to humans and living organisms, property, and the environment, are regulated by the U.S. Environmental Protection Agency (EPA) and, when transported in commerce, by the U.S. Department of Transportation (DOT).

EPA chooses to specifically list hazardous substances and extremely hazardous substances rather than providing objective definitions. Hazardous substances, as listed, are generally materials that, if released into the environment, tend to persist for long periods and pose long-term health hazards for living organisms. Extremely hazardous substances, on the other hand, while also generally toxic materials, are acute health hazards that, when released, are immediately dangerous to the life of humans and animals as well as causing serious damage to the environment. When facilities have these materials in quantities at or above the TPQ (Threshold Planning Quantity), they must submit "Tier II" information to appropriate state and/or local agencies to facilitate emergency planning.

DOT regulations provide the following definition for the term "hazardous material":

> *Hazardous material* means a substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and has designated as hazardous under section 5103 of Federal hazardous materials transportation law (49 U.S.C. 5103). The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (see 49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions in part 173 of subchapter C of the referenced chapter.

When a substance meets the DOT definition of a hazardous material, it must be transported under safety regulations providing for appropriate packaging, communication of hazards, and proper shipping controls.

In addition to EPA and DOT regulations, the National Fire Protection Association (NFPA) develops codes and standards for the safe storage and use of hazardous materials. These codes and standards are generally adopted locally and include the use of the NFPA 704 standard for communication of chemical hazards in terms of health, fire, instability (previously called "reactivity"), and other special hazards (such as water reactivity and oxidizer characteristics). Diamond-shaped NFPA 704 signs ranking the health, fire and instability hazards on a numerical scale from zero (least) to four (greatest) along with any special hazards, are usually required to be posted on chemical storage buildings, tanks, and other facilities. Similar NFPA 704 labels may also be required on individual containers stored and/or used inside facilities.

While somewhat differently defined by the above organizations, the term "hazardous material" may be generally understood to encompass substances that have the capability to harm humans and other living organisms, property, and/or the environment. There is also no universally accepted, objective definition of the term "hazardous material event." A useful working definition, however, might be framed as: Any actual or threatened uncontrolled release of a hazardous material, its hazardous reaction products, or the energy released by its reactions that poses a significant risk to human life and health, property and/or the environment.

More than fifty facilities in Twin Falls County submitted Tier II information reporting the presence of significant inventories of hazardous materials on site. The location of sites in populated areas, along with recommended protective action distances (PADs) are shown in Figure 4.5.1.

The map below (Figure 4.5.1) shows the location of facilities within Twin Falls County that have reported the presence of hazardous chemicals above EPA TPQ levels and the protective action distances (PAD) for those chemicals as specified by the DOT North American Emergency Response Guide. These PADs are based on a hypothetical worst-case scenario where the total quantity of the material explodes or is released directly into the air, or by means of combustions or explosion during night time hours.

As indicated by this map, a very large portion of the area within the County's cities and towns is encompassed by one or more facility PAD. In addition, hazardous materials of all kinds are routinely transported on all primary and many secondary transportation arteries. Hazardous materials are also very commonly stocked and used by businesses in smaller quantities than those required to submit Tier II reports, as well as by private individuals. Thus, it is reasonably safe to consider the entire County and its inhabitants to be exposed to risk from hazardous materials. In spite of their widespread use, however, hazardous materials hazard events are relatively rare and even more rarely cause death, injury or large-scale property damage. To some extent this is due to the fact that such hazards are very effectively addressed by inspections, regulations, codes and safety procedures, as well as by specialized emergency response training. The focus of this profile is, therefore, on those situations where there is the risk of a large scale incident that would threaten many lives. Such incidents are generally limited to those involving a large amount of material capable either of exploding or producing a toxic cloud and call for, in the worst-case scenario, for a PAD of one mile or more.

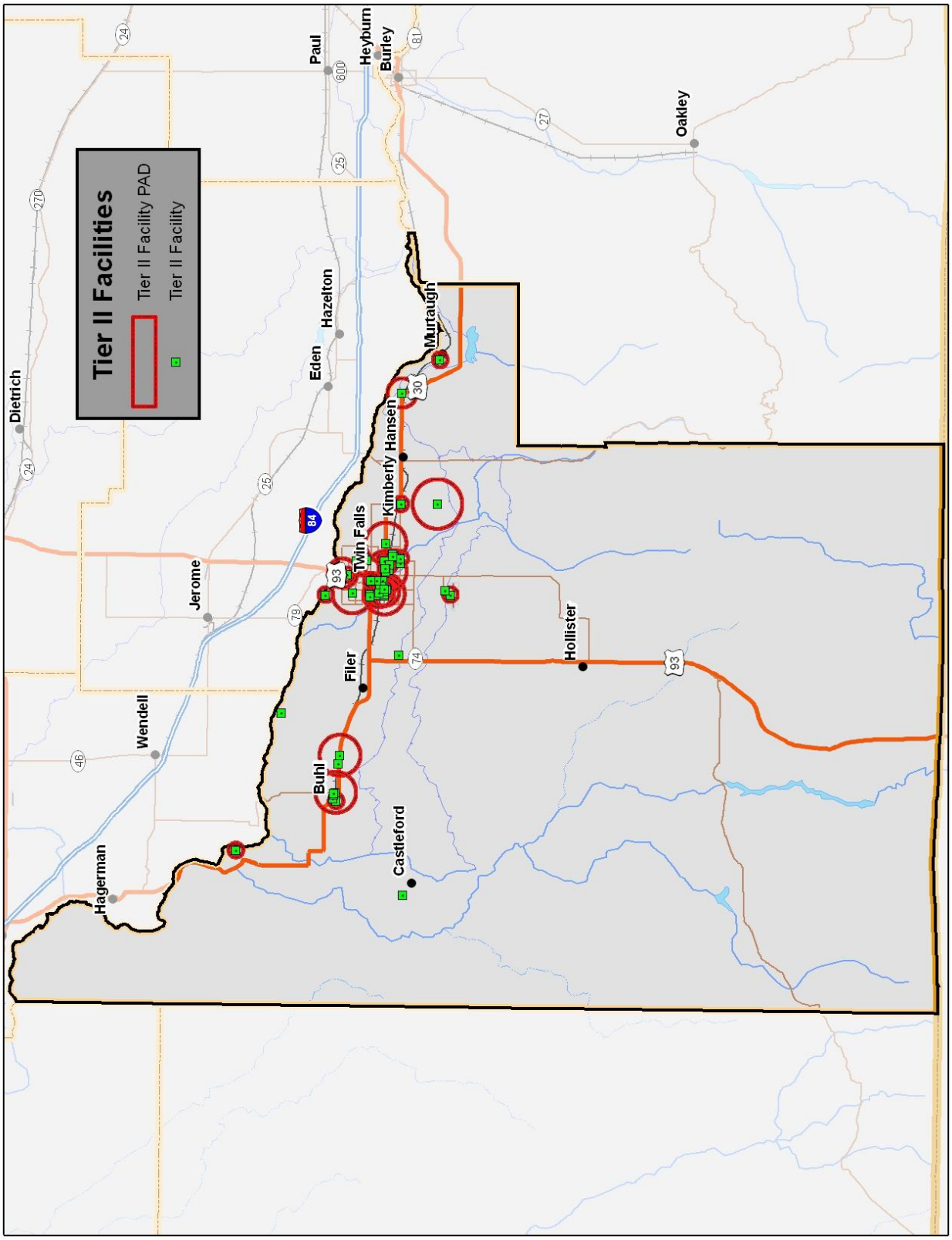


Figure 4.5.1
Twin Falls County Hazardous Materials Tier II Locations & PAD's

Within Twin Falls County there are thirteen (13) facilities with worst-case PADs of one mile or more (See Table 4.5.2).

Facility	Address	City/Zip	Product	PAD
Seneca Foods Corporation	430 7 Ave. S	Buhl, ID 83316	AMMONIA (ANHYDROUS)	7392
Simplot Grower Solutions	4105 N. 1700 E.	Buhl, ID 83316	Ammonia (Anhydrous)	7392
Valley Co-ops Inc. dba Valley Country Store, Buhl Facility	708 US Hwy 30 E.	Buhl, ID 83316	Propane	5280
Western Farm Service, Inc. - Kimberly	473 Hankins Rd. South	Kimberly, ID 83341	ALUMINUM PHOSPHIDE PESTICIDE	8967
ConAgra Foods - Packaged Foods Co., Inc. (Formerly Lamb-Weston)	856 Russet Street	Twin Falls, ID 83301	Ammonia (Anhydrous)	7392
Longview Fibre Paper and Packaging, Inc.	348 S. Park Ave. W	Twin Falls, ID 83301	Propane	5280
Simplot Grower Solutions	797 Eastland Dr. S.	Twin Falls, ID 83301	Ammonia (Anhydrous)	7392
Suburban Propane	139 Locust St. South	Twin Falls, ID 83301	PROPANE	5280
V-1 Propane	South Blake Street	Twin Falls, ID 83301	Propane	5280
Western States Equipment Twin Falls	3085 E. Kimberly Rd	Twin Falls, ID 83301	Propane	5280

Table 4.5.2
Twin Falls County Priority Tier II Facilities

Historical Frequencies

The following table lists Hazardous Material spills responded to by the South Central Idaho Regional Hazardous Materials Emergency Response Team for the year 2007.

County	Date	Chemical	Classification
Twin Falls	1/5/2007	Milk Whey/Diesel	Level I
Twin Falls	1/5/2007	Oil	Level I
Twin Falls	3/16/2007	Non/PCB Mineral Oil	Level I
Twin Falls	3/28/2007	Explosive Material	Level II
Twin Falls	4/11/2007	Diesel	Level I
Twin Falls	4/19/2007	Oil	Level I
Twin Falls	4/25/2007	Diesel	Level II

Twin Falls	8/5/2007	Hydraulic Oil	Regulatory
Twin Falls	8/26/2007	Anhydrous Ammonia	Regulatory
Twin Falls	9/18/2007	Gasoline	Level I
Twin Falls	9/27/2007	Unknown	Unclassified
Twin Falls	12/28/2007		Meth Lab Assist

Table 4.5.3
Hazard Material Events for 2007

According to the Idaho Hazardous Materials/Weapons of Mass Destruction Incident Command and Response Support Plan, there are four levels of Classification in reference to a hazardous materials and or weapons of mass destruction incident. They are as follows:

Regulatory – A release of a Reportable Quantity or less of regulated hazardous materials that does not require any emergency response on the part of public or private sector responders, which would include a weapons of mass destruction threat or suspicion that is clearly a hoax without requiring additional analysis.

Level I – An incident involving any response, public or private, to an incident involving hazardous materials that can be contained, extinguished, and/or abated using resources immediately available to the responders having jurisdiction. A weapons of mass destruction threat or suspicion that requires local response to determine whether or not it is life threatening. A level I incident presents little risk to the environment and/or public health with containment and clean up.

Level II – An incident involving hazardous materials that is beyond the capabilities of the first responders on the scene, and may be beyond the capabilities of the public sector response agency having jurisdiction. Level II incidents may require the services of a State of Idaho Regional Response Team, or other state/federal assistance. This would include a weapons of mass destruction threat or incident that involves explosives, release of toxic material, release of radioactive material or release of organisms that can be analyzed and stabilized using resource that exist within the State of Idaho. This level may pose immediate and/or long term risk to the environment and/or public health and could result in a local declaration of disaster.

Level III – An incident involving weapons of mass destruction/hazardous materials that will require multiple State of Idaho Regional Response Teams or other resources that do not exist within the State of Idaho. These incidents may require resources from state and federal agencies and/or private industry. Level III incidents generally pose extreme, immediate and/or long-term risk to the environment or public health.

Impacts

Because hazardous materials are so widely used, stored and transported, a hazardous material event could take place in almost anywhere. Further, many hazardous materials are used, stored and transported in very large quantities so that the impacts of an event may be widespread and powerful. Regulations and safety practices make such large scale events unlikely, but smaller scale incidents may have severe impacts including:

- Human deaths, injuries, and permanent disabilities
- Livestock/animal deaths
- Destruction of vegetation and crops
- Property damage and destruction
- Pollution of groundwater, drinking water supplies, and the environment
- Contamination of foodstuffs, property, land and structures
- Temporary or long-term closure of transportation routes and/or facilities
- Loss of business and industrial productivity
- Utility outages
- Clean-up and restoration costs
- Losses and inconvenience due to evacuation
- Loss of valuable chemical product

Loss Estimates

Hazardous Material losses occur primarily due to the displacement of populations and the interruption of business. Twin Falls County has a significant number of facilities that use hazardous materials especially in the southern end of Twin Falls City. These facilities are located in close proximity to St. Luke Regional Medical Center, the only hospital in Twin Falls County. A release of hazardous materials in this area could potentially require the evacuation of the hospital to St. Benedicts Medical Center in Jerome.

Hazard Evaluation

Repetitive Loss - none

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

Hazardous Materials has a magnitude score of 16

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Magnitude/Frequency Scoring Rationale

Hazardous materials events often occur suddenly and with little or no warning (Warning Lead Times = 8). Such events usually affect a relatively limited area (Geography Affected = 2) and injuries but minimal deaths may occur (Bodily Harm = 2). Business interruption and economic losses are limited (Economic Loss = 2) and recovery assistance is provided locally (Reconstruction Assistance = 2). The total Magnitude score is, therefore, sixteen (16) which, for Twin Falls County, is in the "Medium" range. Historical records for pandemic/epidemic are available and reliable, indicating that significant hazardous materials events occur infrequently (Frequency = Medium).

Riot/Demonstration/Civil Disorder

Description

State of Idaho statutes define "riot" as follows (Idaho Statute 18-6401 – RIOT DEFINED):

> Any action, use of force or violence, or threat thereof, that disturbs the public peace, or any threat to use such force or violence, if accompanied by immediate power of execution, by two (2) or more persons acting together, and without authority of law, which results in:
>
> (a) physical injury to any person; or
> (b) damage or destruction to public or private property; or
> (c) a disturbance of the public peace;
>
> is a riot.

Also defined in the statutes (Idaho Statute 18-8102 – DEFINITIONS) is "civil disorder":

> "Civil disorder" means any public disturbance involving acts of violence by an assemblage of two (2) or more persons which acts cause an immediate danger of or result in damage or injury to the property or person of any other individual.

The term "demonstration" is not defined in this context in the Idaho statutes but the following is given for "unlawful assembly" (Idaho Statute 18-6404 - UNLAWFUL ASSEMBLY DEFINED):

> Whenever two or more persons assemble together to do an unlawful act, and separate without doing or advancing toward it, or do a lawful act in a violent, boisterous or tumultuous manner, such assembly is an unlawful assembly.

Riots are generally thought of as being spontaneous, violent events whereas demonstrations are usually planned events and are usually intended to be non-violent. Riots seem often to be motivated by frustration and anger, usually over some real or perceived unfair treatment of some group. Historically, riots in this and other countries have been initiated, or appear to have been initiated over such issues as:

- Poor living or working conditions
- Political oppression
- Political conflicts
- Military draft
- Police actions
- Taxation
- Racial conflicts
- Religious conflicts
- Sporting events
- Prison conditions and treatment of prisoners (within prisons)

There are instances, however, where riots have begun during celebrations and other events where the only initiating factor seems to have been the gathering of a crowd of people. The potential for rioting, then, exists any time people gather but a number of factors are associated with the increased probability one will occur including:

- Drug and alcohol use
- Youth of crowd members
- Low socio-economic status of members
- High level of emotions
- A history of rioting on the same or similar previous occasions
- Initiating event, person, or persons

Once violent or illegal activity is initiated, it escalates, possibly at least partly because of the perception that, because all are acting together, there is little probability that any given individual will be arrested or otherwise suffer consequences. Riots may range in scope from a very few people in a small area to thousands over an entire city. Once initiated, large riots are very difficult to suppress, particularly in the United States where law enforcement is constrained by constitutional guarantees as well as personnel limits. Early and decisive action by law enforcement may be effective in suppressing a riot, but police actions may also lead to further escalation.

Historical Frequencies

There are no recorded riot events for Twin Falls County

Impacts

Riots may result in loss of life, injury and permanent disability (participants, bystanders, and law enforcement personnel) as well as looting, vandalism, setting of fires and other property destruction. Law enforcement, emergency medical services and medical facilities and personnel, firefighting and other community resources may be overwhelmed and unavailable to the community at large. Transportation routes may be closed, infrastructure and utilities damaged or destroyed, and public buildings attacked, damaged or destroyed. Social and psychological effects may also cause great impacts.

Lingering fear and resentment can be long-lasting and can greatly impair the ability of a community to function politically, socially and economically.

Loss Estimates

Loss estimates are difficult to make due to a lack of historical events in Twin Falls County.

Hazard Evaluation

Civil Disobedience within Twin Falls County is unlikely, but not ruled out as a possibility. Civil Disobedience within Twin Falls County is a possibility due to the growing number of gangs that have organized in the area as the population diversifies. Loosely organized gangs usually are involved in local acts of violence and drug activity.

Repetitive Loss - none

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

Riot/Demonstration has a magnitude score of 10

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Magnitude/Frequency Scoring Rationale

Riot/Demonstration/Civil Disorder events usually provide less than a day of warning (Warning Lead Times = 4). Very limited geographical areas would be affected (Geography Affected = 2) and no deaths and injuries would be expected (Bodily Harm = 1). Business interruption and economic loss are likely to be quite limited (Economic Loss = 2) and any recovery assistance would be provided at the local level (Reconstruction Assistance = 2). The total

Magnitude score is, therefore, ten (10) which, for Twin Falls County, is in the "Low" range. Historical records available and reliable, indicating that such events have never occurred in Twin Falls County (Frequency = Low).

Terrorism

Description

Terrorism is an unlawful act under both Federal and State of Idaho statutes. Definitions are as follows:

U.S. Code : Title 18 : Section 2331. Definitions

(5) The term "domestic terrorism" means activities that -

(A) Involve acts dangerous to human life that are a violation of the criminal laws of the United States or of any State;

(B) Appear to be intended -

(i) To intimidate or coerce a civilian population;

(ii) To influence the policy of a government by intimidation or coercion; or

(iii) To affect the conduct of a government by mass destruction, assassination, or kidnapping; and

(C) Occur primarily within the territorial jurisdiction of the United States.

Idaho Statute 18-8102 – DEFINITIONS

(5) "Terrorism" means activities that:

(a) Are a violation of Idaho criminal law; and

(b) Involve acts dangerous to human life that are intended to:

(i) Intimidate or coerce a civilian population;

(ii) Influence the policy of a government by intimidation or coercion; or

(iii) Affect the conduct of a government by the use of weapons of mass destruction, as defined in section 18-3322, Idaho Code.

The Federal Emergency Management Agency gives the following as general information on terrorism (http://www.fema.gov/hazard/terrorism/info.shtm):

"Terrorism is the use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion, or ransom. Terrorists often use threats to:

Preparing for terrorism

Agriculture a prime target in Idaho, experts say

By Cassidy Friedman
Times-News writer

TWIN FALLS — The greatest, albeit unlikely, terrorist threat to this cow-dense region is agro-terrorism, emergency preparedness experts say.

Foreign diseases like foot and mouth, or possibly mad cow disease, could be carried into the country.

The first responder likely would be a farmer who spots something wrong with his animal and calls a veterinarian.

The vet would send a sample to the USDA.

When the sample tested positive, the transportation of dairy cows and meat cows nationwide would stop. The food source would be pulled from the market. Farms would turn into slaughterhouses; farmers would burn or bury their cattle.

"It's not very likely, but if it was to occur, it would be the one (terrorist strike) that would have the most impact economically," said Clint Blackwood, Jerome County disaster services coordinator.

Blackwood is hosting a conference Wednesday to assess Idaho's ability to respond to an agro-terrorism attack.

"It would devastate the livestock industry," said Terry Bingham, acting area field officer for the Idaho Bureau of Homeland Security.

Several of the Department of Homeland Security's protection programs use the National Asset Database to make funding decisions. But the Inspector General says that system is flawed. Examining Indiana, Illinois, Florida and Maryland, the Inspector General found their lists included an Apple and Pork Festival, a donut shop and an Anti-Cruelty Society.

Idaho, which ranks 40th in population, ranks 28th in number of terrorist targets with 747 possible targets, according to the National Asset Database.

The state's list of targets has not been released to the public.

In 2005, Twin Falls County received $426,702.71 for planning, training and equipment, said Jackie Frey, coordinator of the Twin Falls Department of Emergency Services.

Since 2003, Cassia County received equipment grants worth $637,696 of which $625,839 has been spent", said Jim Higens, Cassia County sheriff and emergency services coordinator.

"Our threat level is very low," he said. "Our vulnerability is high."

- Create fear among the public.
- Try to convince citizens that their government is powerless to prevent terrorism.
- Get immediate publicity for their causes.

Acts of terrorism include threats of terrorism; assassinations; kidnappings; hijackings; bomb scares and bombings; cyber attacks (computer-based); and the use of chemical, biological, nuclear and radiological weapons.

High-risk targets for acts of terrorism include military and civilian government facilities, international airports, large cities, and high-profile landmarks. Terrorists might also target large public gatherings, water and food supplies, utilities, and corporate centers. Further, terrorists are capable of spreading fear by sending explosives or chemical and biological agents through the mail."

Acts of terrorism, then, are essentially the intentional initiation of the sorts of hazard events that have been discussed in previous sections.

Historical Frequencies

There are no recorded terrorism events for Twin Falls County

Hazard Evaluation

Twin Falls County may well be one of the most vulnerable areas in the State of Idaho to agroterrorism. Agriculture is the life blood of Twin Falls County. Acts of Agroterrorism upon the croplands or the Confined Animal Feeding Operations (CAFOs) or Dairies in the area would be devastating to the economy of Twin Falls County. While there is a potential for other terrorism targets within the County the agricultural community poses the most significant target.

Repetitive Loss - none

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering or Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering or Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help or Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort or Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering or Economy Destroyed	Minutes

Terrorism has a magnitude score of 22.

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Magnitude/Frequency Scoring Rationale

Terrorism events may occur with little or no warning (Warning Lead Times = 8). Numerous scenarios are possible, many of which could affect a moderately large area (Geography Affected = 2) but most of which would cause injuries but few deaths (Bodily Harm = 2). Business interruption and economic loss, under most scenarios, are likely to be moderate (Economic Loss = 2) but Federal recovery assistance would probably be available (Reconstruction Assistance = 8). The total Magnitude score is, therefore, twenty-two (22) which, for Twin Falls County, is in the "High" range. Historical records available and reliable, indicating that such events have never occurred in Twin Falls County and the likelihood is considered to be low (Frequency = Low).

Section 4.6 Vulnerabilities

Critical Infrastructure

County Facilities

The Twin Falls County government offices and County Assistance are housed in two main buildings in downtown Twin Falls: the County Courthouse at 425 North Shoshone Street, and the County Annex Building on 246 East Third Avenue. The courthouse building includes offices for the County Clerk/Auditor/Recorder, the County Commissioners (along with their hearing chambers), the Prosecuting Attorney, the Department of Motor Mehicles, the Fairgrounds, the County Coroner, County Treasurer, and the Sheriff. The Annex Building houses the Planning and Zoning Department and the University of Idaho County Extension Office.

Other government offices include: the Twin Falls County Criminal Justice Facility (juvenile) at 504 2nd Street North, the Snake River Juvenile Detention Center at 2515 Wright Avenue, the Parks and Recreation Department at 450 W. 6th Avenue, and the Adult Probation Office at 162 6th Street.

Public Services and Facilities

With the exception of the County Sheriff's Office, Twin Falls County does not provide any public services directly, nor does the County operate any sort of coordinating public service authority, although informal cooperative agreements have been established among certain districts. All of the County's necessary services are divided among individual public service districts and city offices. Near or within the boundaries of the areas of city impact, most services are provided by the cities or their respective service districts. In other unincorporated areas of the County, services are provided either by the various public service districts or individual landowners.

Sewer and Water

Within the cities and the areas of impact, domestic water distribution and sewage collection and treatment systems are provided by the cities. Decisions regarding development and the availability of sewer and water in the areas of impact, therefore, rest entirely with city governments. Beyond the boundaries of the areas of city impact, city service departments may opt to extend sewer or water lines only if boundaries are re-designated.

In the outlying, unincorporated areas of the County water is supplied by individual wells, and sewage is treated by septic systems. For any parcel of land, sewer and water arrangements must meet the standards of the Idaho Department of Health. All septic systems, regardless of size or location, must be approved by the South Central District Health Department. In addition, standards may also be enforced by the Idaho Department of Water Resources and the Idaho Department of Environmental Quality.

Water availability in Twin Falls County has become a concern because most of the County's developed water resources are concentrated near the Snake River. Surface and groundwater are available in this area. City water systems utilize extensive well networks

from the Snake River Aquifer. Infrastructure to distribute water will remain concentrated in the northernmost part of the County.

In less developed parts of the County, individual wells are the primary source of water. The yield of such wells is sometimes marginal farther away from the Snake River. Water quality also becomes a problem for wells when recharge waters are affected by agricultural run-off or septic systems. Sewer service and discharge is provided in all incorporated cities. The City of Twin Falls treats the sewer discharge for the City of Kimberly.

Waste Management

Twin Falls County is one of the seven Magic Valley counties that own Southern Idaho Solid Waste, a special local government unit providing solid waste management services. Southern Idaho Solid Waste provides disposal facilities for Twin Falls County residents, businesses and industries at two large waste transfer stations; one in Southeast Twin Falls City and the other five miles west of Buhl. Three smaller rural transfer stations are located in the south Twin Falls County area, Roseworth and three Creek communities.

Five solid waste collections companies and the City of Buhl provide residential and commercial collection services through the County. Two commercial recycling facilities, along with a residential curbside recycling program, are located in Twin Falls City while, five public satellite recycling drop-off sites and six Twin Falls School District recycling sites provide public sector recycling services in the County.

Fire Protection

County fire protection is provided by six rural fire protection districts: Buhl, Castleford, Filer, Rock Creek, Salmon Tract, and Twin Falls. In the southern part of the County, fire protection and prevention assistance is also supported by the BLM and the Forest Service. Each district maintains its own staff and fire fighting facilities as well as first response emergency medical services. EMS staff is largely volunteers, depending on the personnel structure of the individual RFD. Emergency medical transport is coordinated with the St. Luke's Magic Valley Medical Center in Twin Falls which serves as the primary emergency medical facility for the entire County.

In the extreme southwest and northwest portions of the County no fire protection authority exists. The Hagerman Fire District extends slightly across the Snake River into Twin Falls County, although the majority of the northwest County remains unprotected. In the southwest County, the BLM provides protection only from fires that have originated on BLM lands; otherwise, the BLM generally does not provide domestic fire protection assistance.

Public Safety

The Twin Falls County Sheriff's Office is a multi-faceted agency that provides several different functions its various divisions and sections. The Sheriff's Office provides law enforcement and protection for the unincorporated areas of the County and for municipalities without police protection as well as support services for several city police departments and for countywide Search and Rescue. The Office maintains an adult detention facility for all law enforcement agencies in Twin Falls County and, on

Federally owned lands within the County, provides law enforcement and protection on a contractual basis with the respective Federal agencies.

Sections within the Office include, administrative services, training, public information and victims services, supply, internal affairs and chaplain services. The Under Sheriff oversees rural patrol that encompasses the mountainous and desert regions, marine patrol on the waterways, animal control to include code enforcement within the County, and search and rescue operations. The Security Services Division provides court security and oversees the detention facility, providing food and medical for inmates and warrants and record keeping for that facility. The Support Services Division encompasses civil intake and civil paper service, driver license services, concealed weapon permits and sex offender registry. The Law Enforcement Services Division is the most public and diverse division within the Twin Falls County Sheriff's Office. Its Urban Patrol Section provides law enforcement and protection within the more populated areas of the County as well as towns without police departments and works closely with its Rural Patrol Section. Traffic enforcement, proactive patrol, K-9, criminal investigations, narcotics investigation, evidence storage, community services, explorer program and the reserve deputy program are all facets of the Law Enforcement Services Division. The Sheriff's Office also maintains a Crisis Response Team.

The Sheriff's Office retains a staff of forty (40) certified law enforcement deputies, thirty-two (32) certified detention deputies, and twenty (20) to twenty-five (25) civilian employees. Headquarters are in Twin Falls, with a satellite office in Buhl.

Health Care

Most of the County's healthcare providers are located in Twin Falls. The St. Luke's Magic Valley Regional Medical Center (SLMVRMC) has 213 licensed beds (with an additional 20 transitional care beds), including a 19-bed intensive care unit, 18 maternal/child unit beds, and 22 pediatric unit beds. SLMVRMC is owned by St. Luke's Health System which also has facilities in Boise, Meridian, and Hailey. SLMVRMC has 124 physicians and surgeons on staff.

Emergency Services (Disaster)

The Twin Falls County Department of Emergency Services is responsible for the coordination of Federal, State, County and municipal resources and services during emergencies and disaster events. The Department's Emergency Operations Plan, which mirrors the Federal Office of Domestic Preparedness' National Response Plan, allows responding agencies within the County to draw upon listed resources and services in a coordinated manner when dealing with emergencies or disasters involving natural or man-made hazards or weapons of mass destruction. The Department has a continuing commitment to attain, with the assistance of the Federal and State Bureaus of Homeland Security, higher levels of excellence in disaster and emergency preparedness, response, recovery, and mitigation.

Public Utilities

The major utilities in the County are electrical, gas, telecommunications and irrigation. There are potential solar and wind power resources in the County.

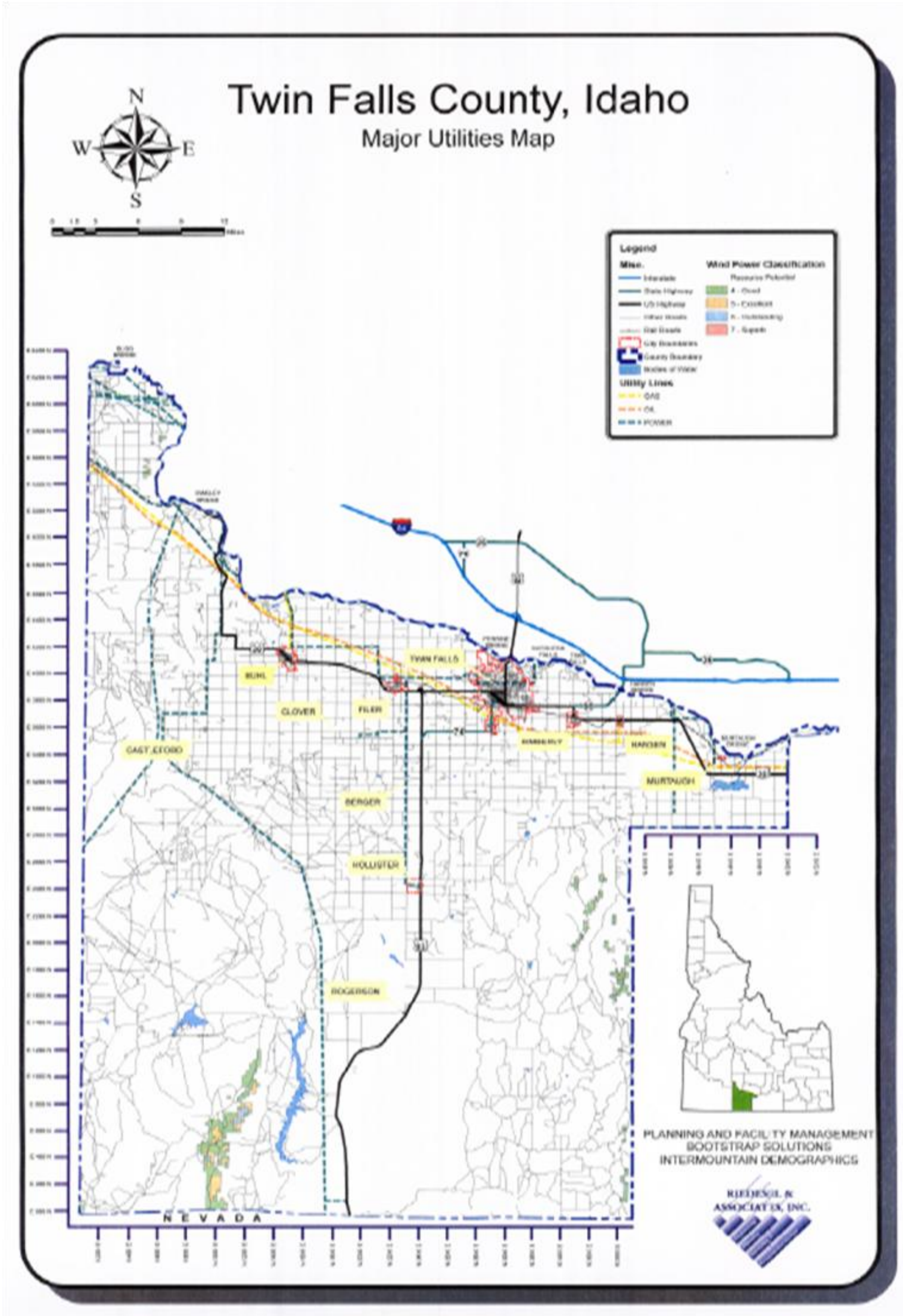


Figure 4.6.1
Twin Falls County Major Utilities Map

The Idaho Power Company supplies electric distribution lines for all homes and commercial areas of the County.

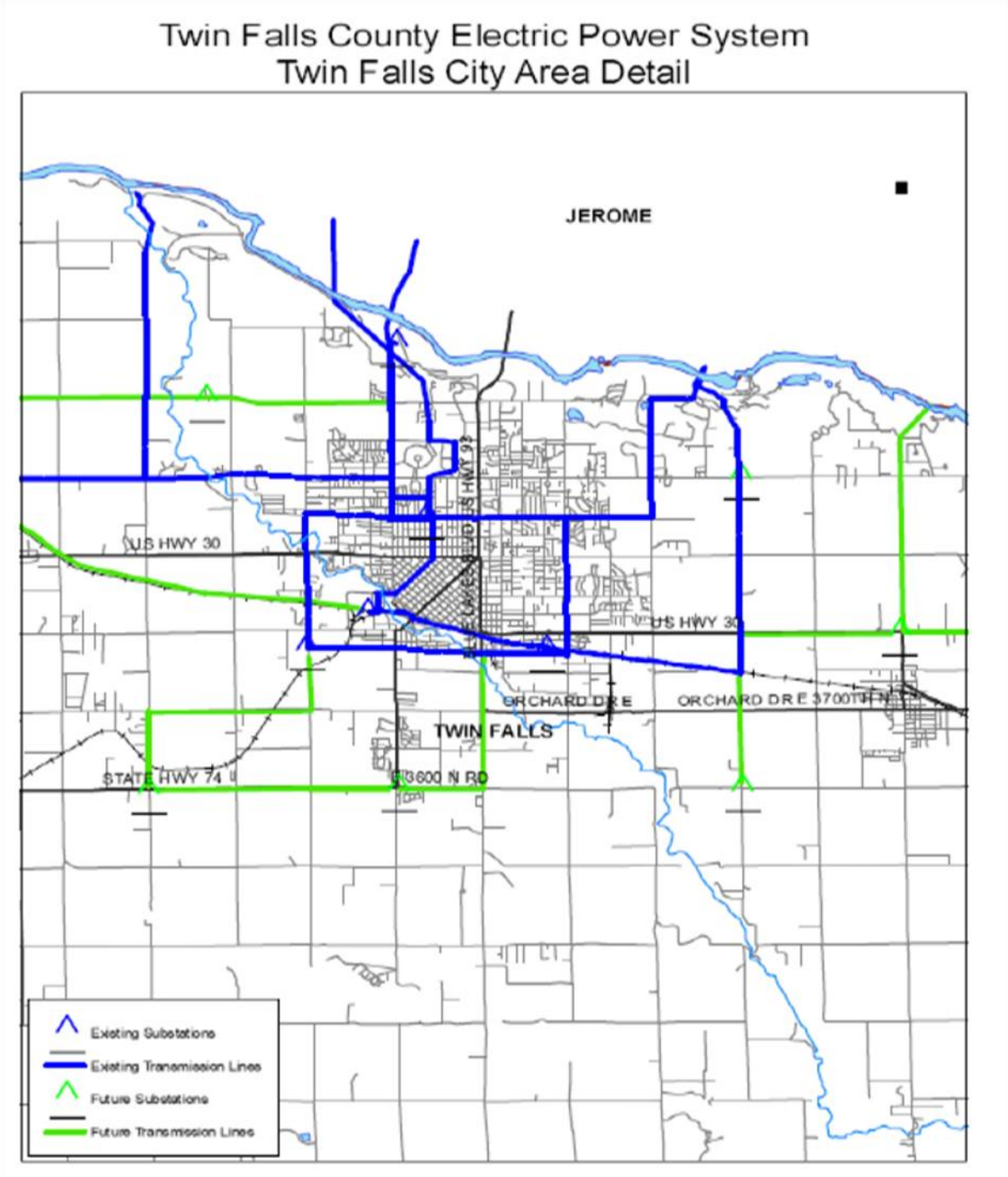


Figure 4.6.2
Twin Falls County Electric Power System Map

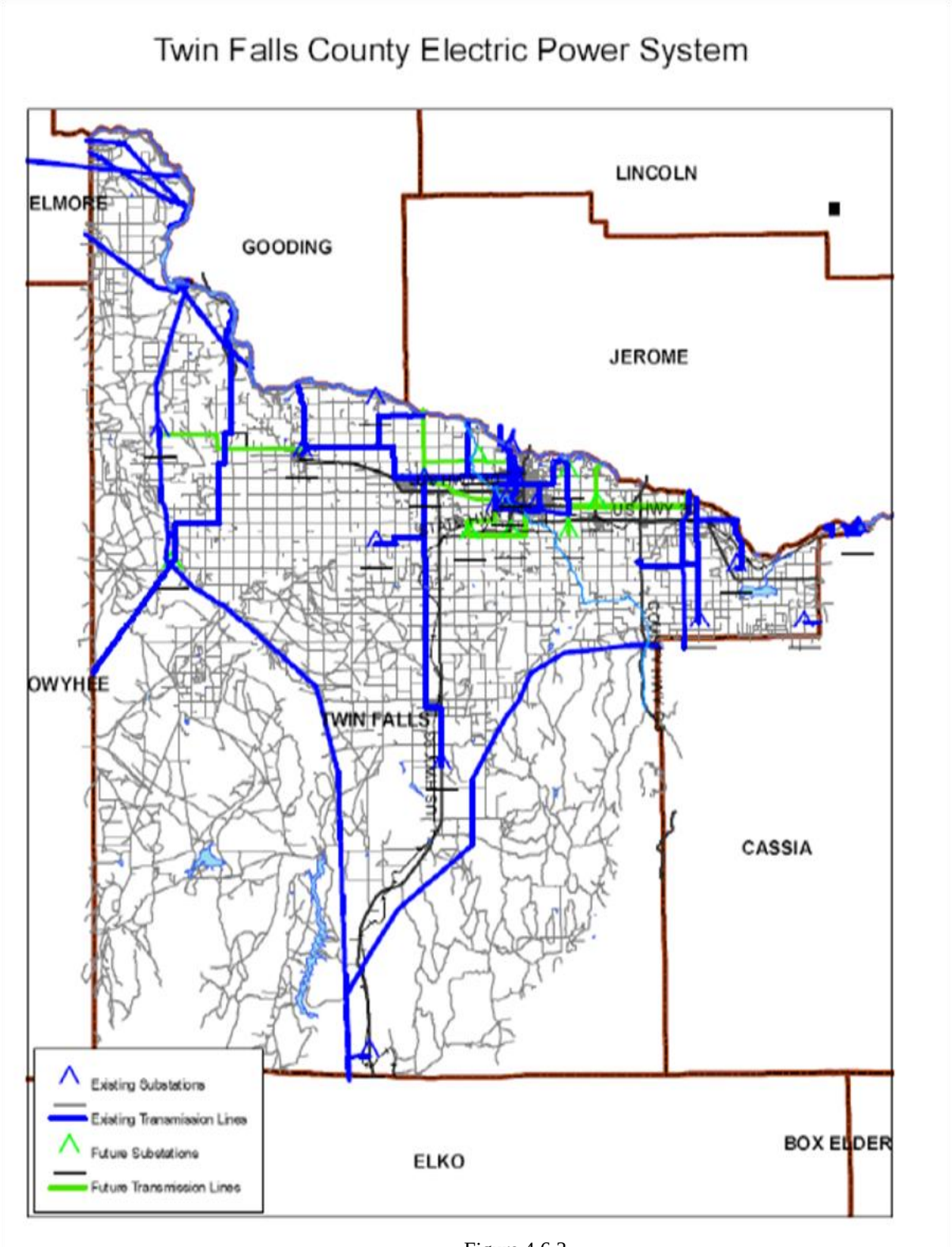


Figure 4.6.3
Twin Falls County Electric Power System

Telecommunications lines coincide with the main power transmission and distribution lines throughout most of the County. In Filer, Hollister, and Rogerson, telephone service is provided by the Filer Mutual Telephone Company.

Intermountain Gas Company provides services to cities in the northern part of the County. Most of the outlying unincorporated areas of the County rely on home heating oil, coal, or electric heat. The availability of geothermal resources and solar energy do present some feasible energy development alternatives, although minimal exploration of these resources for public use has taken place to date.

Propane services are provided by private companies and are used as an energy source in locations not served by Intermountain Gas Company.

Water Resources

This section includes discussion of existing surface and groundwater resources in the local region. Water quality and availability in the County is largely dependent on the relationship between the Snake River and the underlying aquifer beneath Twin Falls County the south side of that river.

Surface Water

The Snake River and its tributaries are the principal sources of surface water in Twin Falls County. The Snake River supports such uses as irrigation, recreation, and wildlife and fish habitat. The Snake River watershed upstream of King Hill, Idaho, commonly called the Upper Snake River Basin, drains an area of 35,857 square miles in Idaho, Wyoming, Nevada, and Utah. At Heise, Idaho, upstream from nearly all irrigation uses, the average flow of the Snake River is about five million acre-feet per year. Irrigation diversions along the Snake River, however, reduce the flow at Milner Dam, where the river enters Twin Falls County, to 2.5 million acre-feet per year. Major tributaries of the Snake River within the Twin Falls County area include: Rock Creek, Deep Creek, Mud Creek, Cedar Draw, and Salmon Falls Creek. Nearly all of these carry substantial amounts of irrigation return flow and/or groundwater discharge. Other significant surface water drainages in Twin Falls County include Cottonwood Creek, McMullen Creek, Fifth Fork of Rock Creek, Shoshone Creek, and Big Creek. Salmon Falls Reservoir has an active capacity of approximately 185,000 acre-feet, and Cedar Creek Reservoir stores roughly 30,000 acre-feet. Other reservoirs of significant yield are located on Deep Creek, Worley Draw, Cottonwood Creek, and along various laterals of the County's canal system.

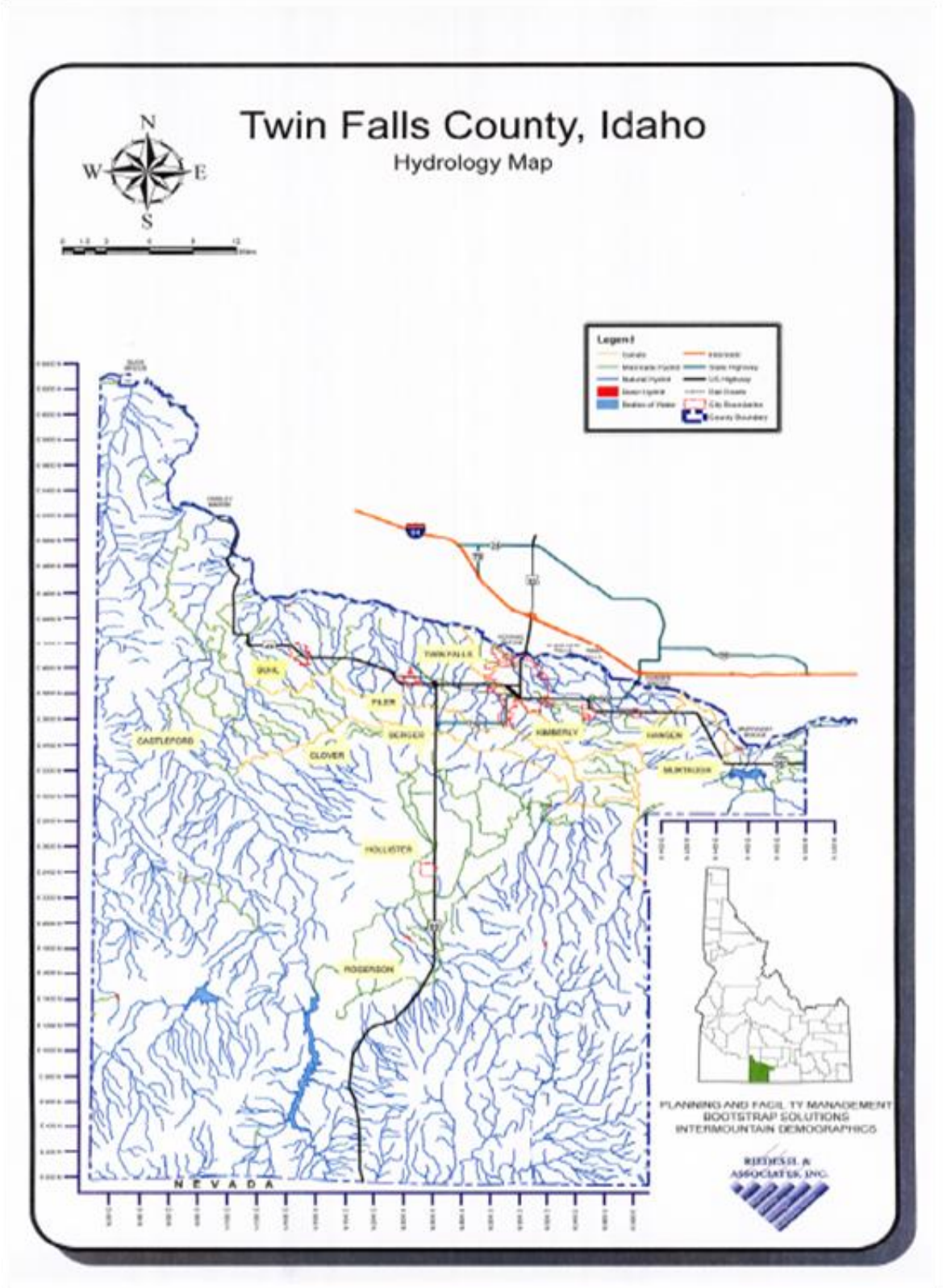


Figure 4.6.4
Twin Falls County Hydrology Map

Irrigation

Since annual rainfall is limited, irrigation is vital to crop production in Twin Falls County. Surface water is the main source of water for irrigation use with more than 83 percent of cropland being irrigated by surface water sources in Twin Falls County. The Twin Falls Canal Company diverts water from Milner Dam and delivers water to approximately 203,000 acres of irrigated cropland through a system consisting of 110 miles of main canals and over 1000 miles of laterals and drains. The High-Line Canal and Low-Line Canal are the main canals that supply water to laterals and farms. The Canal Company also holds storage rights for 96,000 acre-feet at Jackson Lake and 150,000 acre-feet at American Falls. The average annual diversion for irrigation by the Twin Falls Canal Company is 1,113,700 acre-feet of water, an average of 5 acre-feet per acre.

Milner Irrigation District in Twin Falls County diverts an average of 60,000 acre-feet of water from Milner Dam yearly. Approximately 13,500 acres in the eastern portion of Twin Falls County are served by the Milner Irrigation District. Below Milner Dam, the majority of irrigation withdrawals from the Snake River require high-lift pumping because of the steep canyon walls. Other irrigation districts include the Southwest Irrigation District, Salmon River Canal Company, Magic Water Users, Rosewood Irrigation District, and a few small independent water users groups.

Groundwater

One of the largest groundwater systems in the United States, the Snake River Plains Aquifer, borders Twin Falls County to the North. This aquifer provides the largest inflow of water to the Snake River from Milner Dam to King Hill, discharging approximately 5,700 cfs. Another, shallower aquifer in the Twin Falls County region discharges approximately 500 cfs into the Middle Snake River reach from Milner to King Hill.

The primary source of recharge to the Twin Falls aquifer groundwater system is seepage of surface irrigation water from the Twin Falls Canal Company. Other sources of recharge include the Salmon Dam Reservoir, reservoir irrigation supplies, and the precipitation accumulated and transported in drainages from the mountains bordering the County on the south.

Ground water is the sole source of potable water for the residents of Twin Falls County. About 69% of the County residents rely on municipal systems for their drinking water, all of which use ground water as their source. Municipal systems include: Twin Falls, Filer, Castleford, Kimberly, Hollister, Hansen Rogerson and Murtaugh. There are many other public water systems within the County including mobile home and trailer parks, campgrounds, Recreational Vehicle (RV) parks, homeowner associations and others.

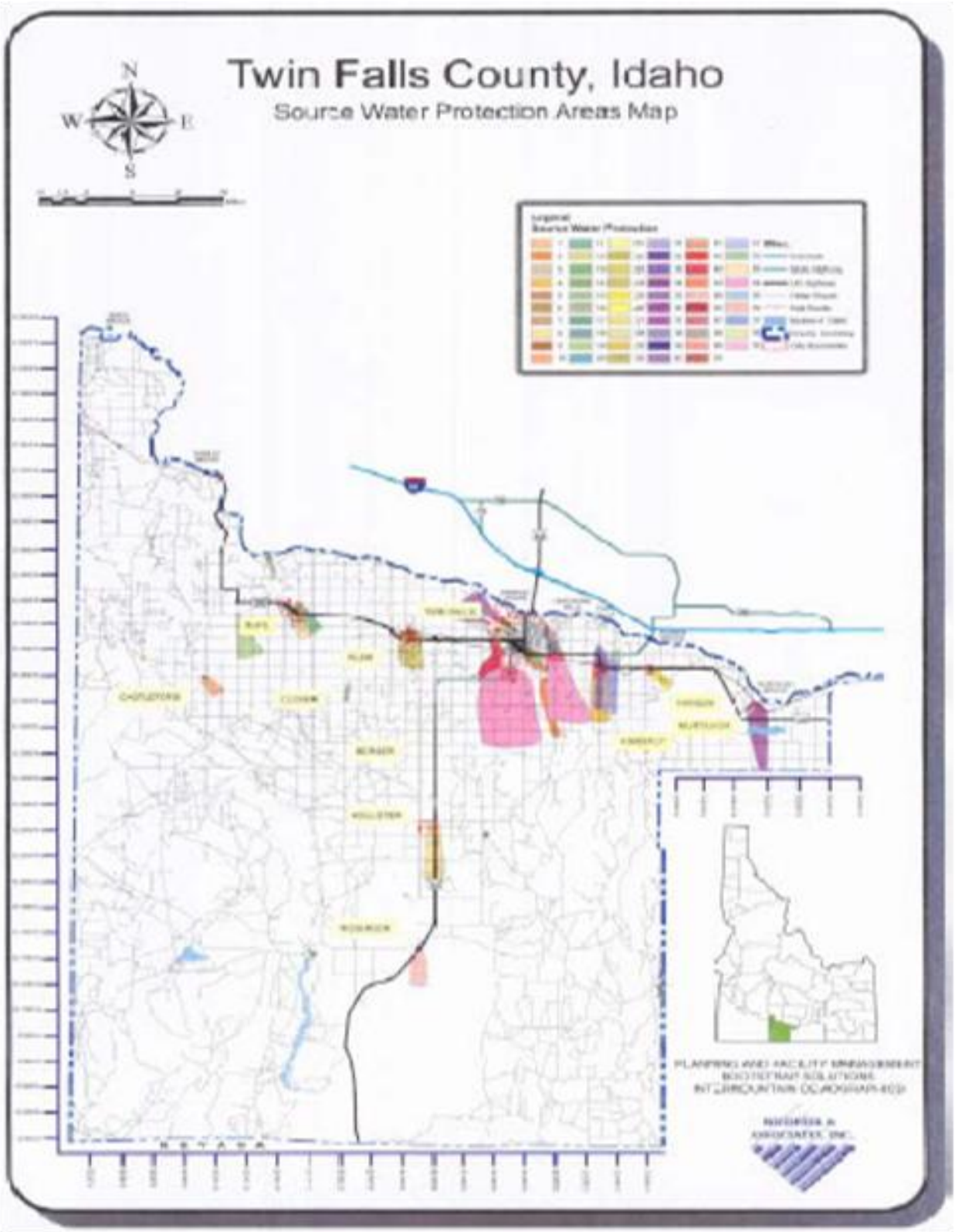


Figure 4.6.5
Twin Falls County Source Water Protection Areas Map

Transportation

The safe and efficient movement of goods by an efficient transportation network is an important component of the economic strategy for Twin Falls County. Goods are transported via air, rail, and truck in Twin Falls County and all play an important role in promoting the efficiency of County transportation.

Roadways

Roads provide the primary transportation mode in Twin Falls County. Within the County there is a complex network of roads and highways of varying conditions and governed by different agencies working together to unite the region with an efficient and functional roadway system. Federal and state highways in Twin Falls County operate under the authority of the Idaho Transportation Department (ITD). The Federal highways in the County are US Highways 30 and 93.The only State highway is a short section of Highway 50 and 74. Twin Falls County has four Highway Districts: Buhl, Filer, Murtaugh, and Twin Falls. These four districts are responsible for all County highway maintenance other than those within the cities of Twin Falls, Buhl, Filer, Kimberly, and Hansen. Each of these cities is responsible for the transportation needs within its annexed boundaries. .

Bridges

There are nearly 100 bridges exceeding 20 feet in Twin Falls County. Four of these have been recommended for replacement, and eight others qualify for rehabilitation due to low ITD bridge sufficiency ratings. All other bridges have ratings of fair to excellent. Preparation of the environmental document identifying potential alignments and environmental impacts for a proposed third bridge crossing of the Snake River is underway. This project, however, is probably 20-25 from completion because former Governor Dirk Kempthorne's "Connecting Idaho" legislation that could have sped up the timetable was compromised to exclude this crossing with its projected $1.64 billion budget.

Airports

Twin Falls County has two airports: Joslin Field Magic Valley Regional Airport located in Twin Falls and Buhl Municipal Airport in Buhl. Commercial air service in Twin Falls County has decreased over the past decade. Joslin Field, which previously had direct commercial flights to Boise and Southeast Idaho, now connects only to Salt Lake City, UT. Joslin Field also serves as the primary backup airport for Friedman Memorial Airport in Hailey, Idaho. Buhl Municipal Airport serves small private planes and crop dusters.

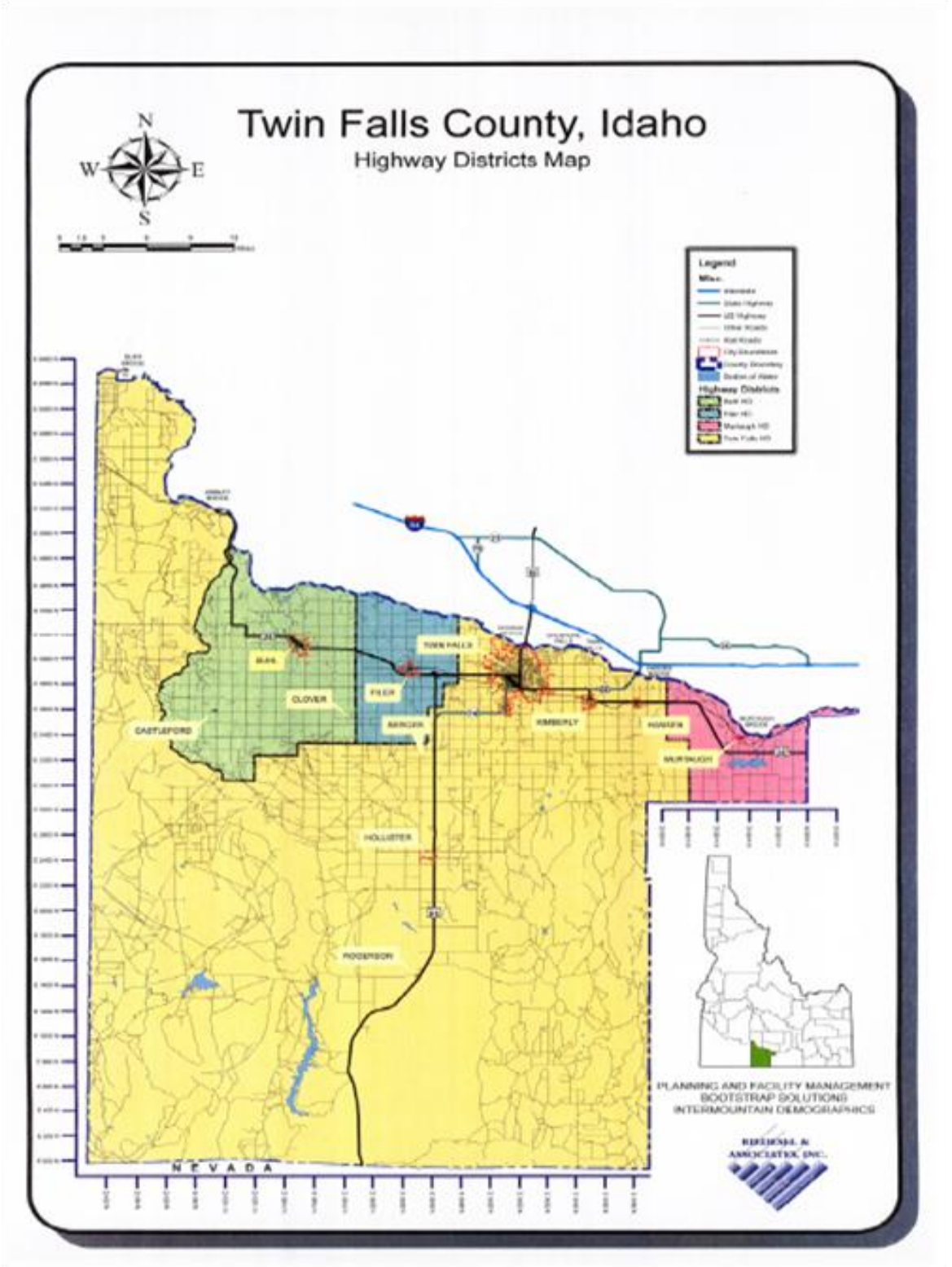


Figure 4.6.6
Twin Falls County Highway Districts Map

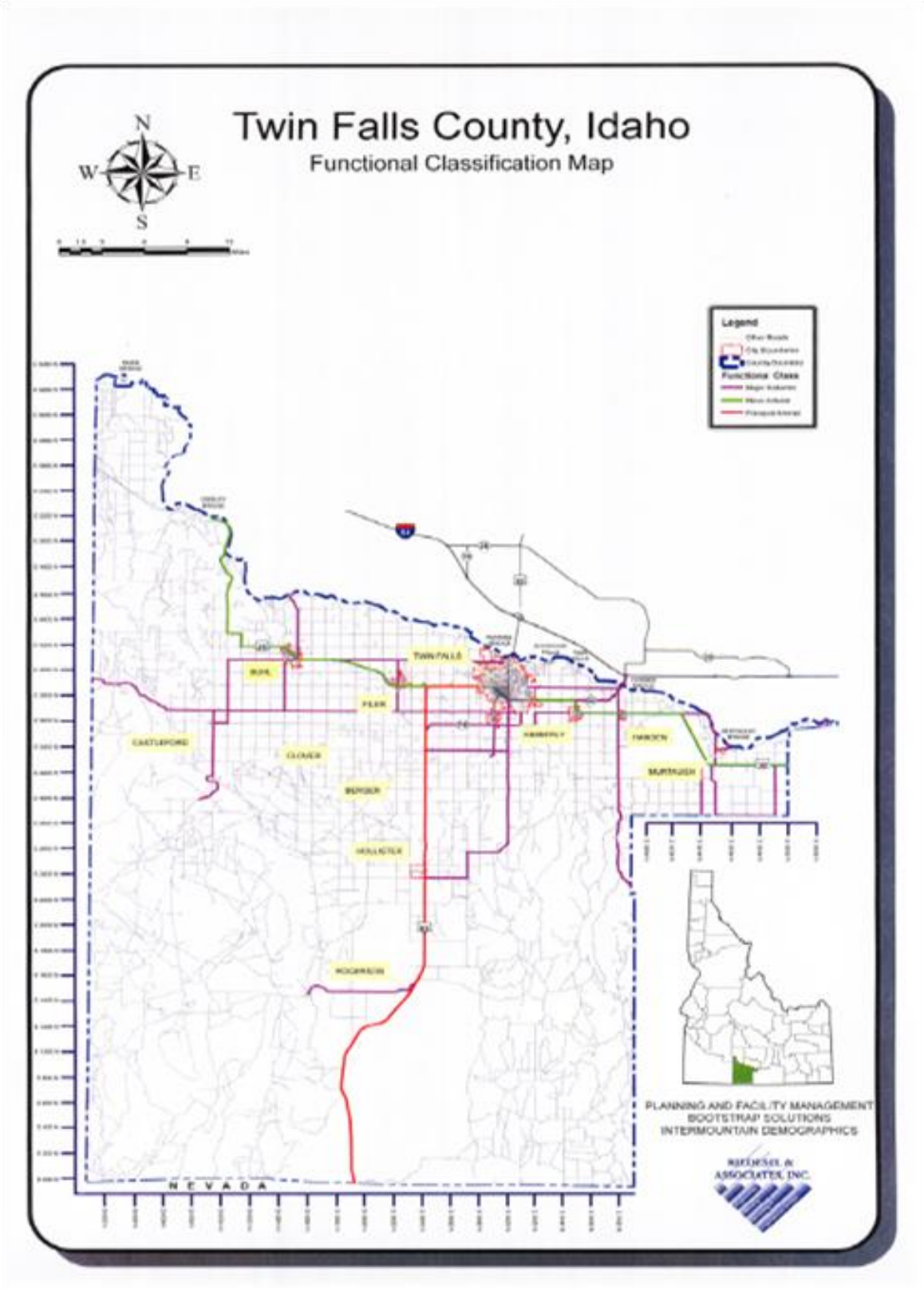


Figure 4.6.7
Twin Falls County Functional Classification Map

Railroads

There is no passenger rail service in Twin Falls County. Freight service is provided by Union Pacific Railroad and by Eastern Idaho Railroad, a short line that carries about 100 cars per day within the County. The majority of the freight is grain, potatoes and other agricultural commodities.

Housing

The County had almost 25,600 total housing units in 2000, a 20 percent increase from 1990. More than 2,900 units were added to the owner occupied housing stock, while renter occupied housing increased by more than 1,200 units. Owner occupied housing units accounted for 68 percent of all occupied units. Renter occupied units accounted for the balance (32 percent). In 2000 there was a vacancy rate of between six and seven percent with about 1,700 housing units being vacant.

By 2005, the County's total housing stock had increased to an estimated 29,361 units, including new houses in the incorporated municipalities and in the unincorporated County. From 2000 to 2005, the County gained more than 3,700 new dwelling units, a 15 percent gain. The number of housing units added to the County's housing stock from 2000 to 2005 (3,766 units) was nearly as great as the total number of units added (4,437 houses) from 1990 to 2000. The 2005 housing unit estimate was based on residential building permit activity occurring in the County and in each city in the County from 2000 through 2004.

More than three-fourths of all housing units in Twin Falls County are traditional single family dwelling units. About 15 percent of the entire County's housing stock is considered multi-family, containing two or more housing units. Mobile homes accounted for about 10 percent of the County's housing stock in 2005. About 90 percent of residential building permits issued between 2000 and 2005 were for single family housing units.

Educational Facilities

There are forty-one (41) public and private schools from pre-school to twelfth grade serving the citizens of Twin Falls County. There are seven (7) public school districts in the county including Twin Falls, Buhl, Castleford, Filer, Hansen, Kimberly and Murtaugh School Districts. All school districts are located in incorporated cities, but their boundaries extend into the County. Eight schools are affiliated with churches.

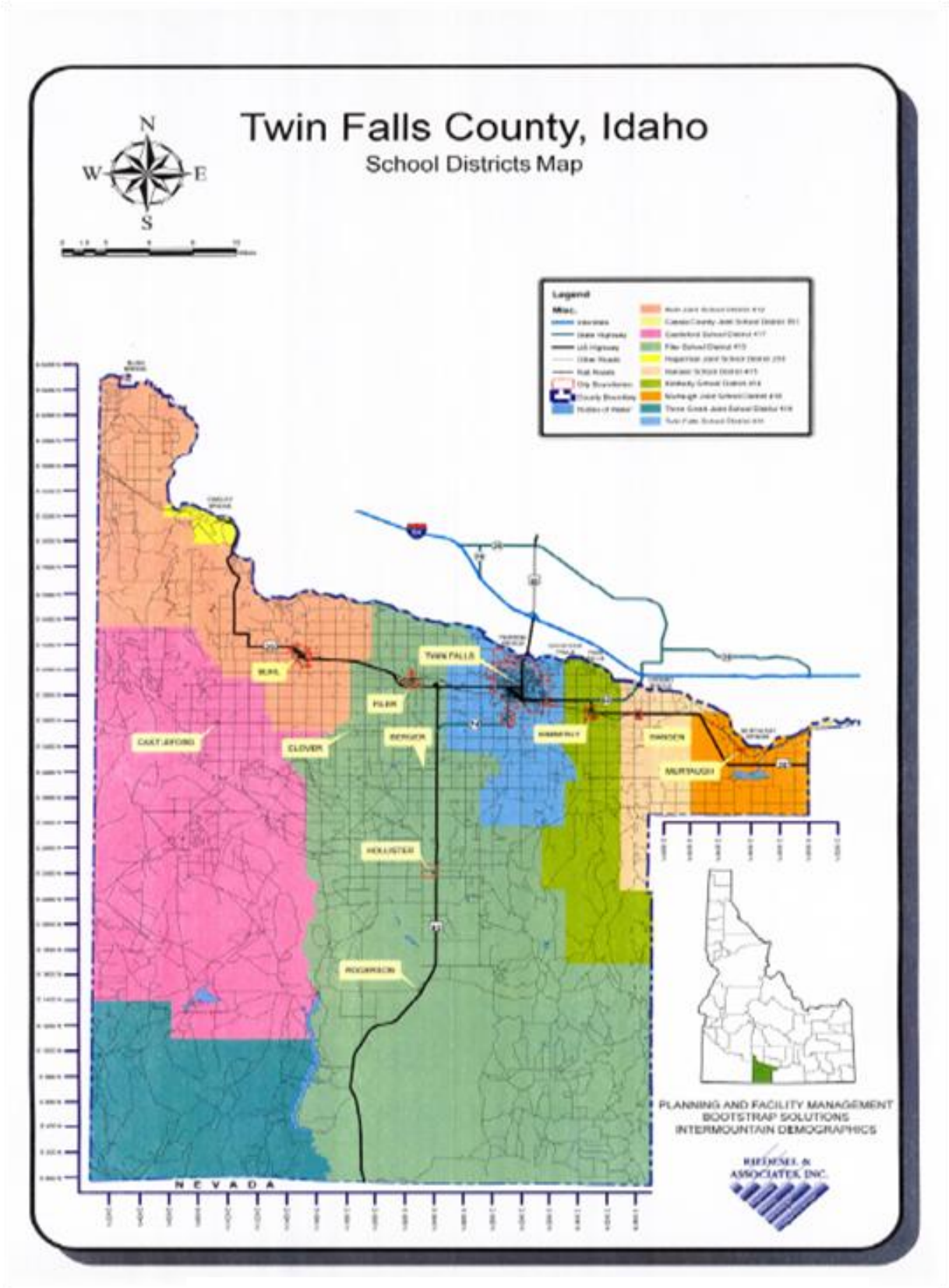


Figure 4.6.8
Twin Falls County School Districts Map

College of Southern Idaho (CSI)

The CSI campus is located on 350 acres in Twin Falls, Idaho and was established in 1964. CSI also provides educational services in Gooding, Burley, Jerome, Boise, and Hailey at its outreach center locations. Presently, the college serves more than 12,000 students annually with a wide array of academic, professional, and continuing education curricula.

Recreation Areas

The Snake River corridor is certainly the most acclaimed recreational resource within Twin Falls County. The river itself is a source of abundant fishing and water sports activities and the Snake River Canyon is home to numerous parks, golf courses, and hiking areas. The views afforded from the canyon rim are among the most spectacular to be found anywhere. Many of these Snake River sites are inter-county in nature; that is, they are either physically located in adjacent counties or else reside within Twin Falls County while attracting many visitors from other counties.

Among the most heavily used local recreational sites in the County are Dierkes Lake, Shoshone Falls, and Rock Creek Park, all of which are within Twin Falls City. The Twin Falls City Parks Department estimates annual attendance for Dierkes Lake to be 61,000 visitors, most from nearby urban locations. Shoshone Falls, with more than 45,000 annual visitors, is more of a regional or national tourism site. Dierkes Lake is approximately 190 acres and Shoshone Falls Park is over 330 acres including the canyon rim area. For a more detailed description of recreation sites in Twin Falls County see Section 2 County Description.

The Twin Falls County Fairgrounds, located near Filer, is also a significant recreation site. The annual fair lasts one week and in 2006 attendance was approximately 117,000.

Federal Recreation Areas

Hagerman Fossil Beds National Monument is located in the northwestern portion of the county and is north of U.S. Highway 30 on approximately 4,300 acres along the Snake River Canyon rim The fossil beds contain preserved remains of animals from the Pliocene era, some 3.5 million years ago. Because the monument was established only recently (in 1988), current facilities are minimal, consisting of an overlook on the canyon rim and a visitor center located across the canyon in Hagerman.

The National Park Service provides Federal law enforcement services for the Monument to enforce Code of Federal Regulations 36, the federal laws of the National Park system that primarily provide for the protection of the cultural and natural resources of the Monument. The National Park Service recognizes their management obligation and responsibility to the park visitor, and is willing to develop cooperative programs to provide adequate emergency services that would be in the best interests of the public, the County, and the National Park Service.

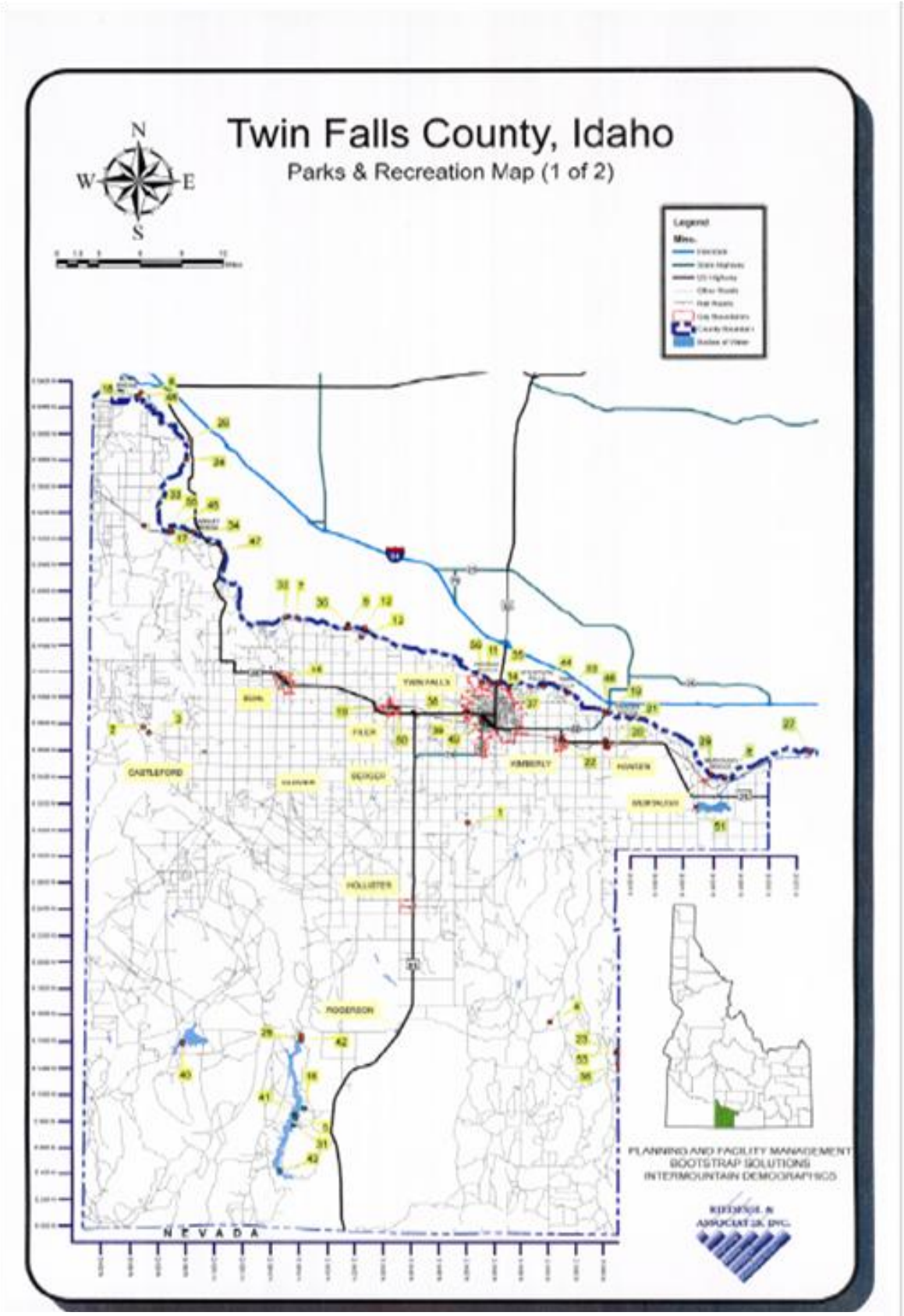


Figure 4.6.9
Twin Falls County Parks & Recreation Map

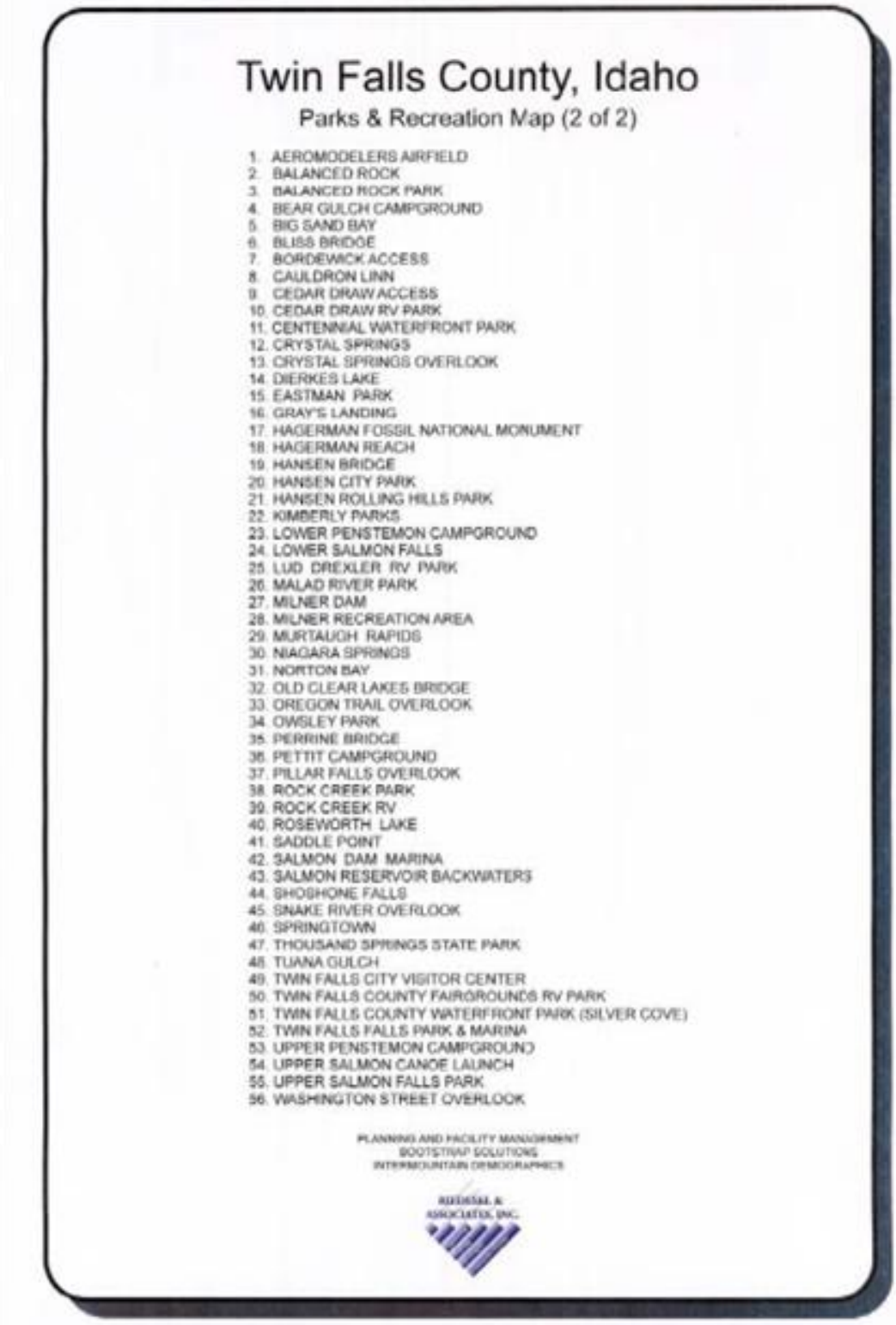


Figure 4.6.10
Twin Falls County Parks & Recreation Map Legend

Cultural and Historical Sites

An abundance of natural resources and the presence of prehistoric and historic elements are among the cultural resources of the County. These resources include archaeological sites, trail remnants, historic camp sites, and historic structures.

Sites associated with the area's prehistory may be attributed to the area's natural resources, particularly in the Snake River Canyon and other drainages. Some of these are documented at the CSI Herrett Center for the Arts and Science, at the Twin Falls County Museum, and at the Idaho State Historical Preservation Office (SHPO) in Boise, Idaho. As of 2005 Twin Falls County had 1846 prehistoric archaeological sites and 1583 historic sites documented in records on file at SHPO.

The County's oldest prehistoric site is the Buhl Woman burial site. This is the second oldest burial discovered in North America datting to approximately 12,600 B.C. The remains of prehistoric hunting and fishing camp sites as well as rock art sites are scattered throughout the County. Twin Falls County also contains significant evidence and sites relating to the early Euro-American exploration and fur trade era, the Oregon Trail migration, the gold rush, including extensive Chinese placer sites along the Snake River, ranching and Carey Act irrigation settlements. Sites such as Auger Falls, Kanaka Rapids, Drytown, Springtown, Shoshone (1870's placer gold camps), the Stricker Stage Station, the Union School, Hollon Family home site, Nat-Soo-Pah, CCC projects, the Evel Knievel jump site, the KTFI radio station, and Salmon Dam are examples of significant historic sites.

The Twin Falls County Historical Preservation Commission developed a survey of many of these sites in 1987 and has worked through the years with signage projects, nominations of sites to the National Register of Historic Places, historic road surveys, and surveys/mapping of Auger Falls in the Snake River Canyon. The commission is a participant of the Certified Local Government (CLG) Program administered by the Idaho State Historic Preservation Office / Idaho State Historical Society. The following are historical site in Twin Falls County:

- **Alvis, James, House** (added 1980 - **Building** - #80001335) 1311 Pole Line Rd., Twin Falls
- **Bickel School** (added 1990 - **Building** - #90001233) Also known as **Bickel Elementary School; 001703** 607 Second Ave. E., Twin Falls
- **Bowlby, T. P., Barn** (added 1983 - **Building** - #83000293) NE of Buhl, Buhl
- **Buhl City Hall** (added 1978 - **Building** - #78001099) Broadway and Elm St., Buhl
- **Buhl IOOF Building** (added 1984 - **Building** - #84000482) 1014-16 Main St., Buhl
- **Caldron Linn** (added 1972 - **Site** - #72000442) 2 mi. E of Murtaugh, Murtaugh
- **Carlson, Alfred, Barn** (added 1989 - **Building** - #83000296) NE of Buhl, Buhl

- **Cedar Draw School** (added 1991 - **Building** - #91000986) Also known as **Keeton, Raymond & Fairy Faye Frank, House** 4300 N. Rd. between 1900 and 2000 E., Buhl
- **Continental Oil Company Complex** (added 1982 - **Building** - #82005188) Second Ave. S. and Sixth St. S., Twin Falls
- **Dau-Webbenhorst Barn** (added 1983 - **Building** - #83000295) SE of Buhl, Buhl
- **Duquesne, Achille, House** (added 1993 - **Building** - #93000990) 710 W. Midway, Filer
- **Hollister School** (added 1991 - **Building** - #91000984) Also known as **Hollister Elementary; 007973** 2464 Salmon Ave., Hollister
- **Hotel Buhl** (added 1985 - **Building** - #85002158) Also known as **Buhl Hotel** 1004 Main St., Buhl
- **Idaho Power Substation** (added 1978 - **Building** - #78001100)
- **Morse, Burton, House** (added 1993 - **Building** - #93000992) Van Buren St. and Filer Ave., Twin Falls 136 Tenth Ave. N., Twin Falls
- **Kimberly High School** (added 1990 - **Building** - #90001229)
- **Peck, D. H., House** (added 1993 - **Building** - #93000993) Also known as **Kimberly Junior High and District Office/015781** 207 E. 8th Ave., Twin Falls 141 Center St. W., Kimberly
- **Pleasant Valley School** (added 1991 - **Building** - #91000985)
- **Kunze, Gustave, Barn** (added 1994 - **Building** - #83000294) Also known as **O'Marra, Pat and Margaret, House** SE of Buhl, Buhl 3501 E. 3100 N., Kimberly
- **Kunze, Rudolf, Barn** (added 1994 - **Building** - #83000292)
- **Pleasant View School** (added 1991 - **Building** - #91000987) NE of Buhl, Buhl Also known as **Knull Grange** 2500 E. 3600 N., Twin Falls
- **Lincoln School** (added 1990 - **Building** - #90001218) Also known as **Lincoln Elementary School; 015782**
- **Priebe, Walter, House** (added 1993 - **Building** - #93000991) 238 Seventh St., Twin Falls 155 7th Ave. E., Twin Falls
- **Lincoln Street Electric Streetlights Ramona Theater** (added 1976 - **Building** - #76000682) (added 1992 - **Object** - #92000413) 113 Broadway, Buhl
- 105, 120, 147, 174, 189, 210, 217, 242, 275 and 290 Lincoln St., Twin Falls
- **Schick, Henry, Barn** (added 1983 - **Building** - #83000290) SE of Buhl, Buhl
- **Maxwell, Art and Frieda, Barn** (added 1983 - **Building** - #83000291)

- **Smith, C. Harvey, House** (added 1978 - **Building** - #78001101) SE of Buhl, Buhl Also known as **Carl Hahn Residence** 255 4th Ave., E., Twin Falls
- **McCollum, Robert, House** (added 1982 - **Building** - #82000386) 708 E. Shoshone St., Twin Falls
- **Stricker Store and Farm** (added 1979 - **Building** - #79000810) N of Rock Creek, Twin Falls
- **Milner Dam and the Twin Falls Main Canal** (added 1986 - **Structure** - #86001720)
- **Twin Falls Bank and Trust Company Building** Twin Falls Main Canal between Murtaugh and (added 1986 - **Building** - #86002155) Milner Lakes, Murtaugh 102 Main Ave. S, Twin Falls
- **Twin Falls Canal Company Building** (added 1996 - **Building** - #96000944) Also known as **Paul T. Smith Law Office** 162 2nd St., W, Twin Falls
- **Twin Falls City Park Historic District** (added 1978 - **District** - #78001102) 2nd N., 2nd E., and Shoshone Sts., 4th and 6th Aves., Twin Falls
- **Twin Falls Downtown Historic District** (added 2000 - **District** - #00000035) Roughly bounded by 2 Ave. N, 2 St. E, 2 St. W, 2 St. S, 3 Ave. S, 3 St. W., Twin Falls
- **Twin Falls Milling and Elevator Company Warehouse** (added 1995 - **Building** - #95001059) 516 Second St. S., Twin Falls
- **Twin Falls Original Townsite Residential Historic District** (added 2001 - **District** - #01001306) Roughly bounded by Blue Lakes Ave., Addison Ave., 2nd Ave. E, and 2nd Ave. W, Twin Falls
- **Twin Falls Warehouse Historic District** (added 1997 - **District** - #96001592) Roughly bounded by 2nd Ave., 4th St. S and W, and Minidoka Ave., Twin Falls
- **US Post Office--Buhl Main** (added 1989 - **Building** - #89000130) Also known as **Buhl Main Post Office** 830 Main, Buhl
- **Union School** (added 2003 - **Building** - #03000123) Also known as **83-16951** 21337 US 30, Filer.

Between 1862 and the 1880s, major transportation thoroughfares passed through the area now known as Twin Falls County. Besides the Oregon Trail, the Toano and Kelton freight roads were constructed at this time, and were well used until the advent of the railroad in 1883.

Twin Falls County has a rich ethnic heritage that forms the foundations for a very diverse population. Some important ethnic groups represented in the County prior to 1900 were Native American, French Canadian, and Chinese. People of Japanese, Basque, Hispanic, Southeast Asian, Czechoslovakian and other Eastern European origin comprise some of the more contemporary ethnic groups

Twin Falls County Asset Inventory Summary

Table 4.6.1 provides an inventory of County-wide assets.

Asset Type	Asset	Quantity[1]
General	Geographical Area	1,924.85 square miles
	Census Tracts	14
	Households	ca. 23,000 (2000 Census Bureau data)
	Population	64,284 (2000 Census Bureau data)
	Buildings[2] (83% Wood Frame, 17% Other Types)	ca. 21,000
	Total Building Replacement Value[3] (excluding contents)	$2,997,000,000
Essential Facilities	Hospitals/Medical Clinics(SLMCRMC)	1 (218 total beds)
	Schools	41
	Fire Stations	8
	Police Stations	5
	Emergency Operations Facility	2
High Potential Loss Facilities	Dams	17 (four "high hazard")
	Hazardous Materials Sites	73
	Military Installations	0
	Nuclear Power Plants	0
Transportation Lifeline Systems	Highways	184 km - 105 bridges
	Railways	1
	Light Rail	none
	Bus	1
	Airports	2
	Total Value	$1,450,000,000
Utility Lifeline Systems[4]	Potable Water	
	Wastewater	
	Natural Gas	1
	Crude and Refined Oil	
	Electric Power	1
	Communications	
	Total Value	$201,000,000

1. HAZUS Data unless otherwise noted
2. 99% Residential
3. 82% of Value Attributable to Residential Buildings
4. 11,600 total km of pipes

Table 4.6.1 Twin Falls County-Wide Assets Inventory

Section 4.7 Risk Summary

The Hazard Assessment Process conducted in sections 4.1 – 4.6 was used to establish a basis for determining the cost effectiveness and priority of implementing mitigation strategies. To this end, the following steps were carried out:

1. A list of hazards to be considered was developed.
2. Each hazard was profiled. Profiles include:
    a. A description of the hazard and, where possible, objective definitions including levels of severity,
    b. A description of the possible impacts of the hazard,
    c. A County profile and/or profiles of individual locations where the hazard event may occur, including levels of severity and probabilities of occurrence.
3. For each location, vulnerabilities that may be affected by a hazard event were identified. These vulnerabilities include but are not necessarily limited to:
    a. Human population
    b. Structures
    c. Structure contents
    d. Crops and livestock
    e. Other property
    f. Critical Infrastructure
    g. Economic assets and business activities
    h. Social systems
    i. Others
4. Possible losses due to a hazard event at each location and at the various levels of severity were estimated.

To complete the process of establishing the level of risk severity associated with a hazard, each hazard was assessed based on estimated losses and the likelihood of a hazard event using the information gathered in steps 1-4 above. The risks associated with each hazard were based on historical occurrences and scientific projections. Hazard assessment activities included the use of FEMA's HAZUS but because of limitations with FEMA's HAZUS data, Twin Falls County's own current GIS property valuation data was primarily used to generate loss estimates. Hazard assessment activities also include the mapping of hazards, at-risk structures including critical facilities, and repetitive flood loss structures, the location of at-risk structures, land use, and populations. These mapping activities were completed as part of a hazard assessment and linked to appropriate mitigation strategies which address requirements derived during the assessment process with the specific goal of reducing the risk.

Risk was determined in part by the frequency of a given hazards event as determined by looking at historical and scientific data and then balanced against the perception of the AHMP Committee and scored using the criteria below.

Frequency	
Ranking	**Description**
HIGH	Multiple Times a Year to 5 Years
MEDIUM	5 to 25 Years
LOW	25 Years to Hasn't Happened

Table 4.7.1 Hazard Frequency

Quantification of the risk was based on the three critical issues: life safety, property damage, and environmental insult. In addition other issues tied to community support of risk mitigation including social, cultural, and economical issues were included.

Hazard Magnitude					
Value	**Reconstruction Assistance From**	**Geography (Area) Affected**	**Expected Bodily Harm**	**Economic Loss**	**Warning Lead Times**
1	Family	Parcel	Little to No Injury / No Death	No Sheltering / Some Income Loss	Months
2	City	Block or Group of Parcels	Multiple Injuries with Little to No Medical Care / No Death	Little Sheltering / Some Economic Loss	Weeks
2	County	Section or Numerous Parcels	Major Medical Care Required / Minimal Death	Sheltering Requiring Neighboring Counties Help / Major Business Interruption	Days
4	State	Multiple Sections	Major Injuries / Requires Help from Outside County / A Few Deaths	Major Sheltering Effort / Major Business and Economic loss	Hours
8	Federal	County Wide	Massive Casualties / Catastrophic	Major Sheltering / Economy Destroyed	Minutes

Table 4.7.2
Hazard Magnitude

Severity Ranking was then completed based on derived criteria compiled by the AHMP Committee from technical experts and the identified stakeholders. The severity ranking includes the determination of magnitude using the criteria below multiplied by the frequency score discussed above.

Risk Severity Ranking

Each hazard was scored as to magnitude and frequency of occurrence. Table 4.7.3 provides an overall ranking of the hazards by magnitude. Boxes highlighted in Red indicate the highest magnitude; boxes highlighted in yellow indicate the medium magnitude with green boxes signifying the lowest magnitude. Table 4.7.4 illustrates the severity ranking for the hazards facing Twin Falls County when magnitude is compared to frequency. The risk ranking, as described in Section 1, is based on frequency and magnitude. Priorities for risk reduction activities are based on risks rankings which are determined using a frequency/magnitude score. The highest score would be for an event with a high frequency of occurrence and a high magnitude of potential harm. Even though Wildland Fire is the third highest ranked hazard from a magnitude perspective, it is the highest overall ranked hazard because of frequency of occurrence. The lowest ranked hazards have been placed in the low/low box and include extreme heat and cold, snow avalanche, dam failure, riot/demonstration/civil disobedience. It should be noted that there is a potential for hazardous events to occur from each listed hazard in this Plan. The Severity Ranking as completed were done using the risk analysis information presented in the hazard profiles in Sections 4.1-4.5 and then juxtaposing that information against the vulnerabilities described in Section 4.6.

Twin Falls County Magnitude Ranking	
Hazard	**Magnitude**
Earthquake	28
Terrorism	22
Wildfire	20
Nuclear	20
Epidemic	19
Drought	18
Winter Storm	16
Hazardous Materials	16
Flash Flood	15
Tornado	15
Dam Failure	15
Hail	14
Structural Fire	14
Straight Line Wind	13
River/stream Flooding	13
Lightning	12
Extreme Cold	11
Landslide	11
Extreme Heat	10
Riot/Demonstration	10
West Nile Virus	7

Table 4.7.3 Magnitude Ranking

Repetitive Loss Summary

Twin Falls County has some monetary loss from repetitive damage caused by Straight Line Wind and Drought. The most significant repetitive losses are to the agricultural industry. These losses are associated with damage caused by straight line winds to crops and removal of top soils during wind events. Structural damage associated with straight line wind is typically minor and repair by the structure owner.

There have been no NFIP Repetitive Loss Claims filed in Twin Falls County.

Magnitude/Frequency

	Low	Medium	High
Low	Extreme Heat Extreme Cold Riot/Demonstration	Dam Failure	Earthquake Nuclear Terrorism Epidemic Drought
Medium	Landslide	Flash Flood River/Stream Flooding Tornado	Winter Storm
High	Lightning West Nile Virus	Straight Line Wind Structural Fire Hazardous Materials Hail	Wildfire

Table 4.7.4 - Twin Falls County Risk Ranking

Individual Jurisdictional Risk Rankings

The Twin Falls County All Hazard Mitigation Plan has been developed as a County Based plan however; each jurisdiction risk was ranked independently from the County and the other jurisdictions. The tables below provide a summary of the ranking for each jurisdiction.

City of Twin Falls

Magnitude/Frequency

	Low	Medium	High
Low	Extreme Heat Extreme Cold Riot/Demonstration Dam/Canal Failure	Drought	Earthquake Nuclear Terrorism Tornado Epidemic
Medium	Landslide	Hail River/Stream Flooding	Winter Storm Flash Flood
High	Lightning West Nile Virus	Straight Line Wind Structural Fire Wildfire	Hazardous Materials

Table 4.7.5 - City of Twin Falls Risk Ranking

City of Buhl

Magnitude/Frequency

	Low	Medium	High
Low	Extreme Heat Extreme Cold Riot/Demonstration Landslide River/Stream Flooding Dam/Canal Failure	Earthquake	Nuclear Terrorism
Medium			Winter Storm Hail Tornado Flash Flood Epidemic
High	Lightning West Nile Virus	Straight Line Wind Structural Fire Hazardous Materials	Wildfire Drought

Table 4.7.6 - City of Buhl Risk Ranking

City of Kimberly

Magnitude/Frequency

	Low	Medium	High
Low	Extreme Heat Extreme Cold Riot/Demonstration Landslide Tornado	Earthquake	Nuclear Terrorism Epidemic
Medium		River/Stream Flooding Canal Failure	Winter Storm Hail Flash Flood
High	Lightning West Nile Virus	Straight Line Wind Structural Fire Hazardous Materials	Wildfire Drought

Table 4.7.7 - City of Kimberly Risk Ranking

City of Filer

Magnitude/Frequency

	Low	**Medium**	**High**
Low	Extreme Heat Extreme Cold Riot/Demonstration Landslide	Tornado Earthquake	Nuclear Terrorism Epidemic
Medium		Flash Flood River/Stream Flooding Dam/Canal Failure	Winter Storm Hail
High	Lightning West Nile Virus	Straight Line Wind Structural Fire Hazardous Materials	Wildfire Drought

Table 4.7.8 - City of Filer Risk Ranking

City of Murtaugh

Magnitude/Frequency

	Low	**Medium**	**High**
Low	Extreme Heat Extreme Cold Riot/Demonstration Landslide Earthquake River/Stream Flooding Dam/Canal Failure	Tornado	Epidemic Nuclear Terrorism
Medium		Flash Flood	Winter Storm Hail
High	Lightning West Nile Virus	Straight Line Wind Structural Fire Hazardous Materials	Wildfire Drought

Table 4.7.9 - City of Murtaugh Risk Ranking

City of Castleford

Magnitude/Frequency

	Low	Medium	High
Low	Extreme Heat Riot/Demonstration Earthquake River/Stream Flooding Dam/Canal Failure		Nuclear Terrorism Epidemic
Medium	Landslide	Flash Flood Extreme Cold	Winter Storm Hail Tornado
High	Lightning West Nile Virus	Structural Fire Hazardous Materials	Wildfire Drought Straight Line Wind

Table 4.7.10 - City of Castleford Risk Ranking

City of Hollister

Magnitude/Frequency

	Low	Medium	High
Low	Extreme Heat Extreme Cold Riot/Demonstration Earthquake Landslide Dam/Canal Failure		Nuclear Terrorism Epidemic
Medium	River/Stream Flooding	Structural Fire Hazardous Materials Flash Flood	Winter Storm Hail Tornado
High	Lightning West Nile Virus		Wildfire Drought Straight Line Wind

Table 4.7.11 - City of Hollister Risk Ranking

City of Rogerson

Magnitude/Frequency

	Low	**Medium**	**High**
Low	Extreme Heat Extreme Cold Riot/Demonstration Earthquake Landslide Dam/Canal Failure		Nuclear Terrorism Epidemic
Medium	River/Stream Flooding Flash Flood	Structural Fire Hazardous Materials	Winter Storm Hail Tornado
High	Lightning West Nile Virus		Wildfire Drought Straight Line Wind

Table 4.7.12 – City of Rogerson Risk Ranking

City of Hansen

Magnitude/Frequency

	Low	**Medium**	**High**
Low	Extreme Heat Extreme Cold Riot/Demonstration Landslide Tornado	Earthquake	Nuclear Terrorism Epidemic
Medium		River/Stream Flooding Dam/Canal Failure Hazardous Materials	Winter Storm Hail Flash Flood
High	Lightning West Nile Virus	Structural Fire	Wildfire Drought Straight Line Wind

Table 4.7.13 – City of Hansen Risk Ranking

Section 5 Land Use Planning/Disaster Mitigation Integration

This section of the Twin Falls County All Hazard Mitigation Plan examines the relationship between the County's Comprehensive Plan, Land Use or Zoning Ordinances, and the AHMP. Incorporating hazard mitigation practices into land use planning is extremely important as future developments are planned and constructed. Through proper planning within the individual jurisdictions risk to property owners can be reduced and future disaster related economic losses avoided. Land Use and Mitigation Planning Integration are seen as critical components of the mitigation program in Twin Falls County.

Twin Falls County Comprehensive Plan

As adopted and updated on October 24, 2007, the Twin Falls County Comprehensive Plan supports the tenants and goals of this AHMP. The land use goal of the Comprehensive Plan specifically seeks to:

- provide a variety of land uses meeting the needs of the residents of Twin Falls County,
- maintain the agricultural nature of the area,
- manage growth, and
- preserve private property rights.

Other, related goals support the desire to preserve rural areas of County while planning for orderly growth, and to protect water and other resources. The County desires to increase population around current population centers while limiting growth in the agricultural areas. One significant, important policy is creation of zoning ordinances and transition zones that will provide for and protect a variety of land uses

The goal of the Hazardous Area chapter of the Comprehensive Plan is to carefully insure the highest level of safety and security for County residents through accurate identification and elimination of potential hazards to property and life. The Comprehensive Plan is well structured and sets forth an excellent strategy for long term management of the County.

Suggested updates to the Comprehensive Plan include:

1. Designate Wildland Urban Interface areas as a special land use category.
2. Update Hazards to reflect the ranking of hazards from the AHMP.
3. Address High Wind separately in the Hazardous Areas Chapter

Material from the Twin Falls County Comprehensive Plan was used extensively to develop the AHMP, particularly the community descriptions and County infrastructure information in Sections 2 and 4.6.

Twin Falls County Land Use/Zoning Ordinances

The County recently updated and adopted new land use ordinances that appear to do an exceptional job of protecting the community from flooding events and structure fires. With the goals of the Comprehensive Plan in mind, the existing ordinances were reviewed and juxtaposed against the hazardous areas identified in Section 4. The following recommendations are made to revise, improve or develop new ordinances:

1. Develop and adopt a Wildland Urban Interface Ordinance.
2. Standardize roadway/street widths for improved access in hazardous areas.
3. Develop an ordinance for areas prone to high winds
4. Develop an ordinance that discourages building on Canyon Rim.
5. Change Uniform Building Code references to the International Building Code
6. Adopt the International Building Code County-wide, including all incorporated cities.

As the County implements the All Hazard Mitigation Plan it should seek to work in a multi-jurisdiction manner to integrate mitigation planning into the individual cities land use planning practices and into the highway districts transportation plans. This will ensure the basic tenants of mitigation are codified and practiced as a matter of policy and best management practices.

Section 6 Mitigation Project Implementation Roadmap

Hazard mitigation is defined as any cost-effective action(s) that has the effect of reducing, limiting, or preventing vulnerability of people, culture, property, and the environment to potentially damaging, harmful, or costly hazards. Hazard mitigation measures which can be used to eliminate or minimize the risk to life, culture and property, fall into three categories:

4) Those that keep the hazard away from people, property, and structures,
5) Those that keep people, property, or structures away from the hazard, and
6) Those that reduce the impact of the hazard on victims, i.e., insurance.

This mitigation plan identifies key strategies that fall into all three categories.

Hazard mitigation measures must be practical, cost effective, and culturally, environmentally, and politically acceptable. Actions taken to limit the vulnerability of society to hazards must not in themselves be more costly than the anticipated damages.

The primary focus of this Plan is on decision making for land use and capital investment. Mitigation proposals are made and prioritized based on risk assessment that takes into account the magnitude of hazards, their frequency of occurrence, and the vulnerabilities of the community to them. This helps to assure that risk reduction efforts, whether for homes, roads, public utilities, pipelines, power plants, public works, or other projects, are both necessary and cost effective.

In the past, hazard mitigation has been one of the most neglected emergency management programs. Because disaster events are generally infrequent and the nature and magnitude of the threat is often ignored or poorly understood priority to fund and implement mitigation measures is low. Mitigation success can be achieved, however, if accurate information is portrayed to decision makers and the public through complete hazard identification and impact studies, followed by effective mitigation management.

Prioritization Process

Initial prioritization of the Mitigation Projects occurred at the Local Mitigation Workshop where representatives from the County came together to approve the risks severity ranking, the goals, and associated projects. (See Attachment 1 for meeting minutes). The projects were selected based on the goals and related objectives of the Plan. The basic tenants of the process, as discussed in the scope and mission statement of this Plan, was life safety first, protection of critical infrastructure second, and reduction of repetitive loss third. Those projects that were selected and listed and then roadmapped as the four highest priority projects were selected based on the following criteria:

- Hazard Magnitude/Frequency
- Potential for repetitive loss reduction
- Benefit / Cost
- Vulnerability to the Community

- Population Benefit
- Property Benefit
- Economic Benefit
- Project Feasibility (environmentally, politically, socially)
- Potential project effectiveness and sustainability
- Potential to mitigate hazards to future development

The County Commissioners participating in the Workshop were given the final voice in the approval process.

Ongoing Prioritization Process

Differing prioritization processes will occur within the County and the participating Cities after the Plan is adopted and then becomes a living document with annual evaluation and updating.

The prioritization process will continue to be based on the three basic tenants of Mitigation Planning; 1) Save lives, 2) Protect critical infrastructure, and 3) Eliminate repetitive loss.

The process will reflect that a key component in funding decision is a determination that the project will provide an equivalent or more in benefits over the life of the project when compared with the costs. Projects will be administered by county and local jurisdictions with overall coordination provided by the County Emergency Services Coordinator.

County Commissioners and the elected officials of all jurisdictions may evaluate opportunities and establish their own unique priorities to accomplish mitigation activities where existing funds and resources are available and there is community interest in implementing mitigation measures. If no Federal funding is used in these situations, the prioritization process may be less formal. Often the types of projects that the County can afford to do on their own are in relation to improved codes and standards, department planning and preparedness, and education. These types of projects may not meet the traditional project model, selection criteria, and benefit-cost model. The County will consider all pre-disaster mitigation proposals brought before the County Commissioners by department heads, city officials, fire districts and local civic groups.

When Federal or State funding is available for hazard mitigation the requirements that establish a rigorous benefit-cost analysis as a guiding criterion in establishing project priorities will be followed. The County will understand the basic Federal grant program criteria which will drive the identification, selection, and funding of the most competitive and worthy mitigation projects.

Prioritization Scheme

The following numerical scoring system developed by Northwest Laboratories[34] may be helpful and used to prioritize projects. The system was modified slightly to represent the basic mitigation tenants chosen by Twin Falls County. This prioritization serves as a guide for the County when developing mitigation activities. This project prioritization scheme has been used in other Counties with the State of Idaho and is designed to rank

[34] Valley County, Idaho, All Hazards Mitigation Plan, pages 123-127

projects on a case by case basis. The County mitigation program does not want to restrict funding to only those projects that meet the high priorities because what may be a high priority for a specific community may not be a high priority at the County level. Regardless, the project may be just what the community needs to mitigate disaster. The flexibility to fund a variety of diverse projects based on varying reasons and criteria is a necessity for a functional mitigation program at the County and community level.

To implement this case by case concept, a more detailed process for evaluating and prioritizing projects has been detailed below. Any type of project, whether County or City specific, will be prioritized in this more formal manner.

To prioritize projects, a general scoring system has been developed. This prioritization scheme has been used in Statewide all hazard mitigations plans. These factors range from cost-benefit ratios, to details on the hazard being mitigated, to environmental impacts.

The factors for the non-planning projects include:

- Hazard Magnitude/Frequency
- Potential for repetitive loss reduction
- Benefit / Cost
- Vulnerability to the Community
- Population Benefit
- Property Benefit
- Economic Benefit
- Project Feasibility (environmentally, politically, socially)
- Potential project effectiveness and sustainability
- Potential to mitigate hazards to future development

Since some factors are considered more critical than others, two ranking scales have been developed. A scale of 1-10, 10 being the best, has been used for hazard magnitude/frequency, potential for repetitive loss reduction, cost, vulnerability to the community, population benefit and property benefit. Economic benefit, project feasibility, potential to mitigate hazards to future development, and potential project effectiveness and sustainability are all rated on a 1-5 scale, with 5 being the best. The highest possible is 65.

The guidelines for each category are as follows:

Hazard Magnitude/Frequency

The Hazard Magnitude/Frequency rating is a combination of the recurrence period and magnitude of a hazard. The severity of the hazard being mitigated and the frequency of that event must both be considered. For example, a project mitigating a 10-year event that causes significant damage would receive a higher rating than one that mitigates a 500-year event that causes minimal damage. For a ranking of 10, the project mitigates a high frequency, high magnitude event. A 1 ranking is for a low frequency, low magnitude event. Note that only the damages being mitigated should be considered here, not the entire losses from that event.

Potential for repetitive loss reduction

Those projects that mitigate repetitive losses receive priority consideration here. Common sense dictates that losses that occur frequently will continue to do so until the hazard is mitigated. Projects that will reduce losses that have occurred more than three times receive a rating of 10. Those that do not address repetitive losses receive a rating of 1.

Benefit / Cost

The analysis process will include summaries as appropriate for each project, but will include benefit / cost analysis results. Projects with a negative benefit / cost analysis result will be ranked as a 0. Projects with a positive Benefit / Cost analysis will receive a score equal to the projects Benefit / Cost Analysis results divided by 10. Therefore a project with a BC ratio of 50:1 would receive 5 points; a project with a BC ratio of 100:1 (or higher) would receive the maximum points of 10.

Vulnerability of the Community

A community that has a high vulnerability with respect to other jurisdictions to the hazard or hazards being studied or planned for will receive a higher score. To promote participation by the smaller or less vulnerable communities in the County, the score will be based on the relationship to other communities being considered. A community that is the most vulnerable will receive a score of 10, and one that is the least, a score of 1.

Population Benefit

Population Benefit relates to the ability of the project to prevent the loss of life or injuries. A ranking of 10 has the potential to impact 90% or more of the people in the municipality (county, city, or district). A ranking of 5 has the potential to impact 50% of the people, and a ranking of 1 will not impact the population. The calculated score will be the percent of the population impacted positively multiplied by 10. In some cases, a project may not directly provide population benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly effects the population, but should not be considered to have no population benefit.

Property Benefit

Property Benefit relates to the prevention of physical losses to structures, infrastructure, and personal property. These losses can be attributed to potential dollar losses. Similar to cost, a ranking of 10 has the potential to save $1,000,000 or more in losses. Property benefit of less than $1,000,000 will receive a score of the benefit divided by $1,000,000 (a ratio below $1 million). Therefore, a property benefit of $300,000 would receive a score of 3. In some cases, a project may not directly provide property benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly effects property, but should not be considered to have no property benefit.

Economic Benefit

Economic Benefit is related to the savings from mitigation to the economy. This benefit includes reduction of losses in revenues, jobs, and facility shut downs. Since this benefit can be difficult to evaluate, a ranking of 5 would prevent a total economic collapse, a ranking of 3 could prevent losses to about half the economy, and a ranking of 1 would not prevent any economic losses. In some cases, a project may not directly provide economic benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly affects the economy, but should not be considered to have no economic benefit.

Project Feasibility (Environmentally, Politically & Socially)

Project Feasibility relates to the likelihood that such a project could be completed. Projects with low feasibility would include projects with significant environmental concerns or public opposition. A project with high feasibility has public and political support without environmental concerns. Those projects with very high feasibility would receive a ranking of 5 and those with very low would receive a ranking of 1.

Potential to mitigate hazards to future development

Proposed actions that can have a direct impact on the vulnerability of future development are given additional consideration. If hazards can be mitigated on the onset of the development, the County will be less vulnerable in the future. Projects that will have a significant effect on all future development receive a rating of 5. Those that do not affect development should receive a rating of 1.

Potential project effectiveness and sustainability

Two important aspects of all projects are effectiveness and sustainability. For a project to be worthwhile, it needs to be effective and actually mitigate the hazard. A project that is questionable in its effectiveness will score lower in this category. Sustainability is the ability for the project to be maintained. Can the project sustain itself after grant funding is spent? Is maintenance required? If so, are or will the resources be in place to maintain the project. An action that is highly effective and sustainable will receive a ranking of 5. A project with effectiveness that is highly questionable and not easily sustained should receive a ranking of 1.

Final ranking

Upon ranking a project in each of these categories, a total score can be derived by adding together each of the scores. The project can then be ranking high, medium, or low based on the non-planning project thresholds of:

Project Ranking Priority Score

- High 40-65
- Medium 25-39
- Low 9-24[35]

[35] Valley County, Idaho, All Hazards Mitigation Plan, pages 123-127

Mitigation Projects

Listed below are the goals and objectives developed by the AHMP Committee and the priority projects that were developed to address the risks posed. Included in the list is a cost estimate where established or a rough order of magnitude cost and an anticipated period for further investigation, project development and implementation.

Projects highlighted in blue are priority projects that should be implemented first. Projects highlighted in green are of no cost to the County and should be implemented as soon as possible.

Severe Weather

Goal	*Objective*	*Project*	*Responsible Entity*	*Order of Magnitude Cost & Planning Horizon*
Twin Falls County will develop methods to mitigate the losses due to severe weather in the County.	Develop Warning Devices for High Winds.	Install High Wind Warning devices at the entrances of the Hansen and Perrine Snake River Bridges	State of Idaho Transportation Department	$108,560 (Engineered Estimate) 2009 – Apply for Budget Funds 2010 - Install
	Develop Methods to Reduce Straight Line Wind Damage	Plant Wind Breaks along Highway 93 between Hollister and Rogerson	Emergency Services Coordinator/ Private Property Owners	$ 6.70/linear foot - $8.00/linear foot (Engineered Estimate) 2009 – Meet with Private Property Owners and apply for funding 2010 – Plant Fences

Flooding

Goal	*Objective*	*Project*	*Responsible Entity*	*Order of Magnitude Cost & Planning Horizon*
Twin Falls County will continue to participate in the National Flood Insurance Program and develop actions that will reduce the damage to County infrastructure due to flash and stream flooding.	Promoting insurance coverage for severe weather events.	Establish a National Flood Insurance Program for areas prone to flash flooding in Buhl and Castleford	Floodplain Administrator	No Cost – Technical Assistance from IDWR
		Raise the Twin Falls City Sewage Lift Station in the Rock Creek Canyon		2008 Engineering Review determined that this project is not necessary

Geological

Goal	*Objective*	*Project*	*Responsible Entity*	*Order of Magnitude Cost & Planning Horizon*
Twin Falls County will reduce potential damage to County infrastructure and structures through implementation of earthquake mitigation techniques.	Ensure enforcement of seismic building code provisions in the International Building Code as adopted.	Ensure that all Cities within the County have adopted the IBC and properly trained their inspectors.	P & Z Administrator	No Cost 2009 – Work with Cities to Adopt
	Priority seismic retrofitting should be given to schools, public buildings, community evacuation and assessable sites.	Develop a listing of schools and public buildings that need to be seismically retrofitted	Emergency Services	ROM - $50,000 2009 – Seek Funding to evaluate structures. 2010 – Develop prioritize list of buildings to be retrofitted.
		Earthquake Protection or Hardening of the Twin Falls County EOC, the County Jail, and the County Court House.	Emergency Services	ROM - $500,000 2009- Seek Funding to conduct conceptual hardening designs. 2010 – Conduct Designs and Benefit Cost Analysis. Apply for HMA Funding 2011 – Protect Buildings as designed and funded.
	The media can raise awareness about earthquakes by providing important information to the community.	Publish a special section in newspapers with emergency information on earthquakes.	Emergency Services	No Cost – Coordinate with BHS's 25 Year Anniversary of the Borah Peak Earthquake

Goal	*Objective*	*Project*	*Responsible Entity*	*Order of Magnitude Cost & Planning Horizon*
Twin Falls County will reduce the potential damage to property from Landslides by adopting codes and standards for construction in landslide prone areas.		Harden the Twin Falls City Water Supply line coming out of the Snake River Canyon	Twin Falls City Public Works	$66,000 (Engineered Estimate) 2009 – Complete BCA and Submit HMA or Block Grant 2010 – Implement Protection
		Harden the Twin Falls City Sewer line going down the canyon wall into the Snake River Canyon	Twin Falls City Public Works	$66,000 (Engineered Estimate) 2009 – Complete BCA and Submit HMA or Block Grant 2010 – Implement Protection
Twin Falls County will tightly control building on the Snake River Canyon Rim.	Protect Structures along Canyon Rim	Develop an ordinance that restricts building on the Snake River Canyon Rim.	P & Z Administrator	ROM - $5000 2009 – Seek Funding from County to develop ordinance. 2010 – Adopt Ordinance.

Wildfire

Goal	*Objective*	*Project*	*Responsible Entity*	*Order of Magnitude Cost & Planning Horizon*
Twin Falls County will reduce the losses caused by wildfire by continuing the Wildland Urban Interface Mitigation Program.	Conduct Roadside Vegetation Treatments to reduce flammable fuels immediately adjacent to roads in high risk areas.	Develop a standard practice for roadside vegetation management in the Mellon Valley Area.	Wildfire Working Group/ Emergency Services	No Cost 2009 – Develop standard as part of WUI Planning ongoing effort.
	Ensure coordination of WUI Fire Mitigation Projects	Organize a group to jointly apply for grants and other funding avenues to implement WUI Fire Mitigation Actions.	Emergency Services	No Cost 2009 – WUI Working Group Task.
	Develop Additional	Develop an agreement with	Emergency Management/Fire	ROM- $5000 2008 – Seek Funding from BHS

	Water Supplies for Fire Protection	developers and private landowners for access to and use of water sources for fire protection.	Districts	SHSP and develop standard agreement and requirements. 2010 – Execute Agreements.
		Develop an ordinance which establishes the road widths, access, water supply, and building regulations suitable to ensure new structures can be protected.	P & Z Administrator	ROM - $15,000 2009 – Seek Funding from County to develop ordinance. 2010 – Adopt Ordinance.
		Incorporate new developments and structures into existing fire protection districts	Fire Districts	ROM - $5000 2009 – Develop List of properties 2010 – Meet with property owners and promote annexation in Fire District
	Improve access to areas prone to Wildland Fire	Develop a listing of roads, bridges, cattle guards, culverts, and other limiting conditions and incorporate improvements into the Highway District Transportation Plans	Highway Districts	ROM - $150,000 plus annual maintenance cost. 2012 – Develop a LHTAC Grant to evaluate all roadways in the County. Determine Priority actions. 2013 – Ongoing: Repair or Replace damaged culverts, bridges etc.

Biological

Goal	*Objective*	*Project*	*Responsible Entity*	*Order of Magnitude Cost & Planning Horizon*
Twin Falls County seeks to reduce the exposure of humans and animals to the West Nile Virus.	Provide Public Education regarding West Nile Virus	Maintain the "Fit the Bite" program with the Health District.	Health District.	No Cost

Goal	*Objective*	*Project*	*Responsible Entity*	*Order of Magnitude Cost & Planning Horizon*
Twin Falls County will identify risks to livestock from potential biological threats.	Provide Livestock owners with protection information regarding biological threats to their industry.	Work with the Idaho Department of Agriculture to develop protection measures for livestock from Biological Threats.	U of I Extension/ Emergency Services	ROM - $15,000 2009 – Apply for Funding and Conduct Assessments 2010 – Begin Education Campaign

Structure Fire

Goal	*Objective*	*Project*	*Responsible Entity*	*Order of Magnitude Cost & Planning Horizon*
Twin Falls County will seek to reduce losses from Structure fires.	Develop Additional Water Supplies for Fire Protection	Develop an agreement with developers and private landowners for access to and use of water sources for fire protection.	Fire Districts	ROM- $7000 2008 – Seek Funding from BHS SHSP and develop standard agreement and requirements. 2010 – Execute Agreements.

Nuclear Event

Goal	*Objective*	*Project*	*Responsible Entity*	*Order of Magnitude Cost & Planning Horizon*
Twin Falls County will examine the risks posed to the County from Nuclear Facilities and Improvised Nuclear Devices.	Provide continuing information to the Citizens of Twin Falls County regarding the threats related to nuclear materials in the County.	Determine the usage of nuclear materials in the County. The owners and operators of facilities and the transportation methods for nuclear materials.	Emergency Services	ROM - $10,000 2010 – Seek HMEP Grant 2011 – Conduct Assessment

Hazardous Materials Event

Goal	*Objective*	*Project*	*Responsible Entity*	*Order of Magnitude Cost & Planning Horizon*
Twin Falls County will identify hazardous materials transported through the County.	Provide commodity flow information to the Hazardous Materials Response Teams in the area.	Conduct a Hazardous Materials Commodity Flow Study for the County.	Emergency Services	Cost Estimate - $10,000 2009 – Apply for an HMEP Grant and Conduct Study.

Riot/Demonstration/Civil Disobedience

Goal	*Objective*	*Project*	*Responsible Entity*	*Order of Magnitude Cost & Planning Horizon*
Twin Falls County will develop methods to identify and report Civil Disobedience activities.	Provide information to the Citizens in the Community on reporting Civil Disobedience activities.	Conduct a Law Enforcement Public Education Campaign on Civil Disobedience.	Sheriff's Office	ROM - $10,000 2009 – Apply for a Law Enforcement Grant to Conduct Public Education. 2010 – Conduct Program.

Terrorism

Goal	*Objective*	*Project*	*Responsible Entity*	*Order of Magnitude Cost & Planning Horizon*
Twin Falls County will identify measure to protect critical County infrastructure and facilities from potential terror incidents.	Protect Critical Infrastructure and facilities.	Identify all Critical Infrastructure and Facilities in the County and participate with the new BHS Critical Infrastructure Protection Program.	Emergency Services	ROM - $15,000 2009 – Apply for Funding 2010 - Work with LEPC to conduct assessment.

Non-Hazard Specific

Goal	*Objective*	*Project*	*Responsible Entity*	*Order of Magnitude Cost & Planning Horizon*
Provide web based information tools which are accessible to the public in such a manner that they can make informed decisions regarding protective mitigation opportunities and actions.	Deploy the AHMP Hazard Mapping Tools	Develop an AHMP map web link to the Twin Falls County Web Page.	Emergency Services	ROM - $1000 2009 – Construct web link
	Incorporate the hazard and risk information presented in the AHMP	Update Twin Falls Emergency Operations Plan – Base Plan	Emergency Services	$2,500 (Contract Cost) 2008 – Complete
		Update the Twin Falls County Evacuation Plan Annex	Emergency Services	$8,500 (Contract Cost) 2008 – Complete
		Develop an Emergency Support Annex for the Care and Protection of Special Needs Populations	Emergency Services	$7,000 (Contract Cost) 2008 - Complete
		Emergency Power for Relocation Centers	Emergency Services	ROM - $100,000 2009- Engineering Cost Estimate Required 2010 – Conduct BCA and Apply for Funding
	Identify Evacuation Routes and Relocation Centers	Post Evacuation Route Signs directing evacuees to Relocation Centers	Emergency Services	ROM - $15,000 2009 – See LHTAC Funding 2010 – Install Signs

Goal	*Objective*	*Project*	*Responsible Entity*	*Order of Magnitude Cost & Planning Horizon*
Improve hazard assessment information and link it to comprehensive planning to manage new development by encouraging preventative measures in areas vulnerable to natural and manmade hazards.	Enforcement of land-use and development policy to reduce exposure to hazards	Provide AHMP Mapping tools to the Twin Falls County Planning and Zoning Commission	Emergency Services	No Cost 2008 - Provided as a deliverable from the AHMP Contract
		Update the Twin Falls County Comprehensive Plan to include the risks identified in the AHMP	P & Z Administrator	ROM - $50,000 2009 – Seek Funding in County Budget to Revise Comp Plan. 2010 – Revise Comp Plan

Priority Mitigation Projects

Description

The following four projects have been chosen by the Twin Falls County AHMP Committee, and approved by the Twin Falls County Board of Commissioners, as the priority mitigation projects for Twin Falls County. The following is the engineering analysis of the listed projects. The County will perform additional engineering and associated benefit costs analysis before project grants applications are submitted.

The following are the locations of interest:

1. Rock Creek Sewer Lift Station
2. Twin Falls' Main Water Line
3. Twin Falls' Main Sewer Line
4. Perrine and Hansen Bridges

Purpose & Need

The purpose of an All Hazard Mitigation Plan is to evaluate and locate potential hazards, in this case within the public utility and transportation systems. Whisper Mountain requested that Keller Associates review, further investigate, and explore multiple options to relieve any hazards or problems at each of the locations of interest.

Rock Creek Sewer Lift Station

This sewage lift station, located in the Rock Creek Canyon on the corner of Morrison and Addison Avenue across from St. Luke's Medical Center, was thought to have a rim elevation below the 100 year flood elevation. This would allow flood waters to easily flow into the lift station and quickly become a public health and safety concern. It is necessary to ascertain if the invert elevation is above the flood elevation and if not, propose options to mitigate this issue.

Main Water Line

The water line being explored is a main water source for the City of Twin Falls. At present, it travels underground from the bottom of the canyon to the cliff portion of the canyon, is exposed for about 20 feet below the canyon wall, and then continues underground to the top of the canyon where it is fed to the City. Keller Associates was directed to consider the twenty foot exposed stretch of pipe. It is thought to need additional protection from sabotage, natural hazards (overhanging cliffs), and vandalism.

Main Sewer Line

The sewer line that was originally presented to us was initially investigated and found to be abandoned. This abandoned line ran along the face of the cliff and then above ground to the sewage treatment plant. A new line has been installed by drilling through the canyon. There is an exposed, near vertical, twenty foot section of line where the cliff meets the ground. The line then continues back underground to the sewage treatment plant. Keller Associates finds this to be a sound design to mitigate

the previous problem of full pipe exposure. It prevents damage to most of the pipe due to vandalism, natural events, and sabotage. A small, 20 foot portion is still exposed and ways to enclose this segment should be considered.

Bridge Closures

Two of the main bridges accessing Twin Falls are susceptible to high winds and unpredictable conditions. To date, only one substantial accident has occurred within the past 5 years according to the Idaho Department of Transportation. Currently the Idaho Transportation Department has installed weather stations, wind socks, and sensors in the decks, and cameras on both sides of the bridges to monitor conditions. Keller Associates recommends exploring options that would warn oncoming traffic of possible road/bridge hazards and closures so drivers can better prepare for such conditions.

Design Alternatives

The investigation, its findings, and options to safely mitigate problems are explained, and the associated costs are summarized below.

Rock Creek Sewer Lift Station

From correspondence with the Waste Water Department of Twin Falls, it was found that FEMA recorded the 100 year flood elevation to be 3,633 feet. Correspondence with the Water Department of Twin Falls indicates that the lift station is above the 100 year flood elevation.

The Idaho Department of Environmental Quality (IDEQ) in District IV was unable to locate the Record Drawings for the presentation of this report.

The finding, therefore, is that it is unnecessary to alter the in-place design. No further investigation is required.

Main Water Line

The City of Twin Falls Water Department indicates the current main water line is a 36-inch steel pipe lined on the inside with concrete and coated with a layer of concrete on the outside. The exposed pipe on the face of a cliff and is approximately 20 feet long. The cliff rises approximately 33 feet above the top end of the exposed pipe, and the base of the cliff is approximately 40 feet below the lower end. Where the lower end of the pipe emerges from the ground it is supported by a rock and soil thrust block. In the center there is a cement thrust block elevating it above the ground. On the upper side where it reenters the ground, a there is a cement thrust block. Figure 6.1 is a photograph of the exposed portion of the line.

Figure 6.1 – Exposed Water Line

Because its light gray concrete coating contrasts with the dark browns and blacks of the basalt canyon, the pipeline is easily seen from a long distance. It is, therefore, an easily located target for sabotage or vandalism. Further, the thin layer of concrete coating the outside of the line makes it susceptible to damage by rocks that might become detached from the cliff above.

Keller Associates has considered the following protective options:

Option 1 - "No Action": The City of Twin Falls Water Department, reports that here has not been any tampering of the pipeline thus far. Thus, while the line is a valuable asset to the community, the "no action" option has been considered.

Option 2 - "Protective Covering": A concrete cover designed to deflect falling rocks, limit the possibility of sabotage or vandalism, and provide camouflage is considered to be a quick and simple means of resolving concerns.

The proposed covering would have multiple layers of EPDM rubber wrapped to approximately a 6-inch thickness. The composite would then be covered with concrete that would contain the pipe, connect to the cliff face, and deflect falling rocks. The EPDM would reduce the transfer of vibrations from the water pipe to the concrete exterior shell and permit the concrete cover and the pipe to work independently of each other. (See Figure 6.2 for design details.) While the

covering concrete is fresh, it would be covered with basalt rock and surrounding soils to create a natural look and conceal the pipe. A cost estimate is provided in Table 6.12.

Option 3 - "Relocate Line": Because the pipe travels up, along, and through the canyon wall, it is susceptible to many potential hazards. An option would be to move the pipe and run it underground along a road that goes from the base of the canyon to the top. This would make maintenance much easier due and would greatly lessen the likelihood of damage. This was, however, found to be a much more costly approach although it would mitigate nearly all of the current concerns. This option does not provide a specified route but a budgetary estimate of probable cost is provided in Table 6.1.

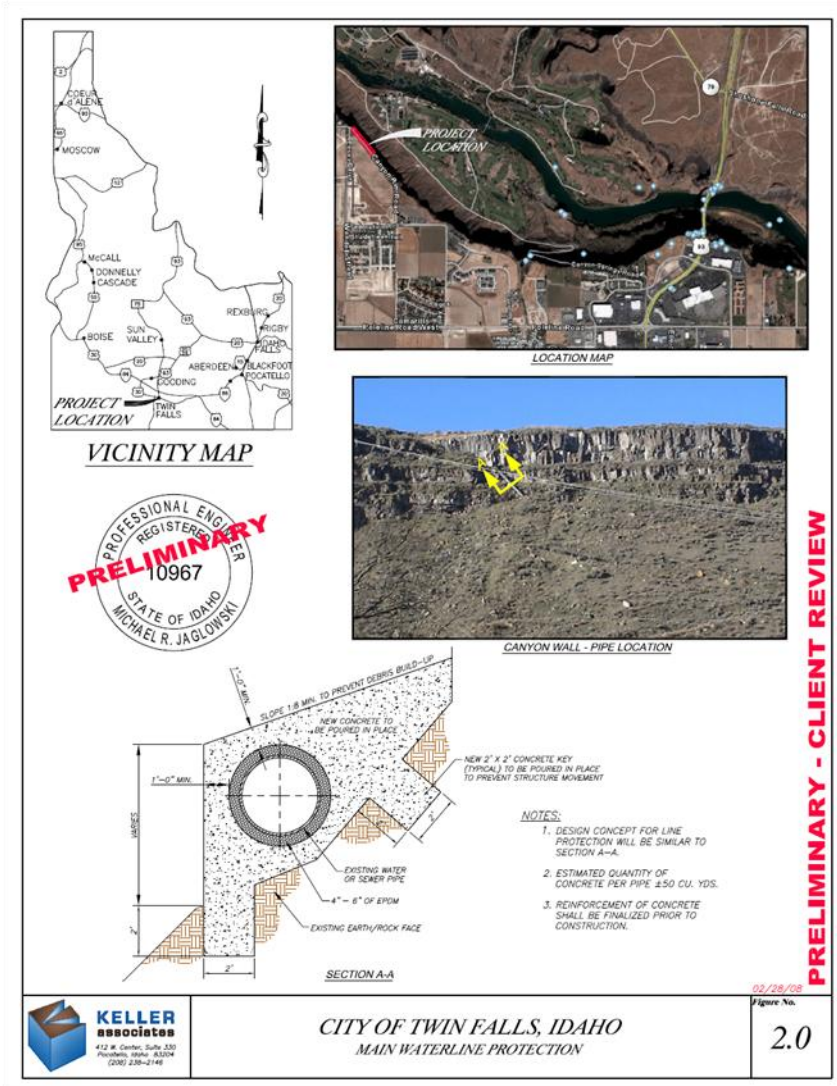


Figure 6.2 – Protective Covering Design Details

Main Water Line Preliminary Project Cost Estimate					
	Description	**Unit Price**	**Unit**	**Quantity**	**Total**
Option 1	none	none		none	none
				Total Project Cost	**NONE**
Option 2	EPDM (6" thick)	300.00	Sheet	50	15,000.00
	Concrete	350.00	CY	50	17,500.00
	Rocks & Soils	250.00	CY	250	250.00
	Crane	2,000.00	Day	1	2,000.00
	Specialty Labor & Safety	1,000.00	laborer/day	10	10,000.00
				Total	**44,750.00**
				Estimated Project Total	44,750.00
				Contractor Overhead and Profit 7.5%	3,356.25
				Recommended Project Contingency 25%	11,187.50
				Engineering & Surveying 15%	6,712.50
				Total Project Cost	**$66,006.25**
Option 3	Relocating Line (approximate location)	165.00	LF	2,500.00	412,500.00
	Manholes	2,000.00	EA	12.00	24,000.00
				Total	**436,500.00**
				Estimated Project Total	436,500.00
				Contractor Overhead and Profit 7.5%	32,737.50
				Recommended Project Contingency 25%	109,125.00
				Engineering & Surveying 15%	65,475.00
				Total Project Cost	**$643,837.50**

Table 6.1 – Preliminary Cost Estimate Water Line Project

Benefit Cost Analysis (BCA)

The BCA will be conducted as part of the engineering design for this project. See the Implementation Roadmap (Line 7)

Funding Options

This project could be funded by either a HMA Grant or a IDOC Block Grant or a combination of both.

Main Sewer Line

The Twin Falls City Waste Water Department reports that the old sewer line going down the canyon has been replaced. The current pipeline travels underground through the canyon wall, is exposed for about 20 feet to make a bend, and then continues underground to the sewage treatment plant. The 20 feet of exposed area has been identified as an area of concern. It is susceptible to the same hazards as the above-discussed water line including sabotage, vandalism, and natural threats. The line is nearly vertical and is constructed of 24-inch high-density polyethylene with 2.5-inch thick walls. A photo of the pipeline is not available.

Keller Associates has considered the following protective options:

Option 1 - "No Action": Because the pipeline black in color, it is camouflaged by the canyon walls. Its wall is quite thick but it is a hard polyethylene composite that can be penetrated relatively easily by large falling rocks, vandalism, or sabotage. Twin Falls Waste Water Department reports that there has been no tampering or damage to the pipeline. Thus, while the line is a valuable asset to the community, the "no action" option has been considered.

Option 2 - "Protective Covering": It is proposed that the pipe be covered similarly to the main water line with a 6-inch thick layer of EPDM to reduce movement of composite materials. The EPDM would be covered with a concrete shell to protect against large impacts and sabotage or vandalism attempts. Basalt and soil would be placed on the fresh concrete during construction of the shell to allow the color of the pipe to blend in with the canyon. The concrete would be molded to the canyon wall to prevent anything from lodging between the canyon and the pipe. Figure 6.2 details the proposed design. The cost for this protection is outlined in Table 6.13.

Option 3 - "Relocate Pipe": Because the pipe has been newly restored, this is not a practical option. Resources have already been allocated to mitigate most of the hazard issues. While this option is not cost effective, a cost estimate is provided in Table 6.2.

Main Sewer Line Preliminary Project Cost Estimate					
	Description	**Unit Price**	**Unit**	**Quantity**	**Total**
Option 1	none	none		none	none
				Total Project Cost	**NONE**
Option 2	EPDM (6" thick)	300.00	Sheet	50	15,000.00
	Concrete	350.00	CY	50	17,500.00
	Rocks & Soils	250.00	CY	250	250.00
	Crane	2,000.00	Day	1	2,000.00
	Specialty Labor & Safety	1,000.00	laborer/day	10	10,000.00
				Total	**44,750.00**
				Estimated Project Total	44,750.00
				Contractor Overhead and Profit 7.5%	3,356.25
				Recommended Project Contingency 25%	11,187.50
				Engineering & Surveying 15%	6,712.50
				Total Project Cost	**$66,006.25**
Option 3	Relocating Line (approximate location)	165.00	LF	3,500.00	577,500.00
	Manholes	2,000.00	EA	15.00	30,000.00
				Total	**607,500.00**
				Estimated Project Total	607,500.00
				Contractor Overhead and Profit 7.5%	45,562.50
				Recommended Project Contingency 25%	151,875.00
				Engineering & Surveying 15%	91,125.00
				Total Project Cost	**$896,062.50**

Table 6.2 – Preliminary Cost Estimate Sewer Line Project

Benefit Cost Analysis (BCA)

The BCA will be conducted as part of the engineering design for this project. See the Implementation Roadmap (Line 7)

Funding Options

This project could be funded by either a HMA Grant or a IDOC Block Grant or a combination of both.

Bridge Closures

The Idaho Transportation Department reports that the bridges of concern have already been provided with devices to measure the surface and weather conditions. Based on the results of the investigation, Keller Associates intends to explore the option of placing flashing warning signs on either side of each bridge to alert drivers of current bridge conditions. Both bridges are heavily used and valuable resources to the community.

Keller Associates has considered the following protective options:

Option 1 - "No Action": The bridges have provided services to the City for many years and it is considered likely that they will continue to be used without incident. There are a few deterrents such as high winds, indicative of Southern Idaho, and aggressive storms creating hazardous surfaces. While there are hazards such as the high winds common to Southern Idaho and winter storms that may create icy conditions, the Idaho Transportation Department has recorded only one major incident in the past five years.

Option 2 - "Flashing Warning Signs": This option is to connect flashing warning signs to the already-installed sensors and weather station that would then convert data into real-time information for the drivers to read before crossing the bridge. This would include an on-site computer system with specific software that would read incoming data, analyze it, and transmit necessary warnings to the bridge signs located on both sides. The estimated cost for this addition is outlined in Table 6.3.

Bridge Closures Preliminary Project Cost Estimate					
	Description	**Unit Price**	**Unit**	**Quantity**	**Total**
Option 1	none	none		none	none
				Total Project Cost	**NONE**
Option 2	RWIS elite Remote Processing Unit	6,200.00	EA	2	12,400.00
	RWIS elite Software License	1,500.00	EA	2	3,000.00
	RPU Strip Heater w/Thermostat	250.00	EA	2	500.00
	Remote Flashing LED Controller-Slave Site	650.00	EA	2	1,300.00
	Remote Flashing LED Controller-RPU Site	7,200.00	EA	4	28,800.00
	Ultrasonic Wind Sensor w/Heater	5,100.00	EA	2	10,200.00
	Sunray 390 PCM Sign and Trailer-Full Matrix	2,900.00	EA	2	5,800.00
	Commissioning by Field Service Engineer	5,300.00	EA	2	10,600.00
	LX Technical Manual	500.00	EA	2	1,000.00
				Total	**73,600.00**
				Estimated Project Total	73,600.00
				Contractor Overhead & Profit 7.5%	5,520.00
				Recommended Project Contingency 25%	18,400.00
				Engineering and Surveying 15%	11,040.00
				Total Project Cost	**$108,560.00**

Table 6.3 – Preliminary Cost Estimate Bridge Closure

Benefit Cost Analysis (BCA)

The BCA will be conducted as part of the engineering design for this project. See the Implementation Roadmap (Line 56)

Funding Options

This project should be funded by Idaho Transportation Funding. A grant through LHTAC could also be used.

Blowing Sand, Dirt, or Snow

Project Description

This project seeks to mitigate the hazards of blowing sand, dirt, or snow along Highway 93 in Twin Falls County. Of special concern is the area between Hollister and Rogerson.

Purpose & Need

Highway 93 in Twin Falls County is subject to high winds that produce blowing snow, sand and dust. When the soil is left exposed after plowing, especially between Hollister and Rogerson, wind storms pick up soil particles decreasing visibility, creating a hazard for automobiles traveling along the highway. During the winter months when snow accumulates on the open fields, strong winds blow this snow into drifts along stretches of the highway. The blowing snow also decreases visibility. The drifting snow covers the road with snow and ice creating a driving hazard. Further, runoff from melting snow seeps under the pavement where it can re-freeze and cause cracking and heaving.

The purpose of this project is to mitigate the hazards created by winds along Highway 93 in Twin Falls County. It is proposed to construct a wind/snow fence to decrease the wind speed allowing dust and snow particles to be deposited near the fence rather than blowing across the road. This both mitigates the hazard and greatly reduces the cost of snow removal. Data available from a Wyoming study shows that storing snow with snow fences costs three cents a ton over the 25-year life of the fence as compared with three dollars a ton for removal[36].

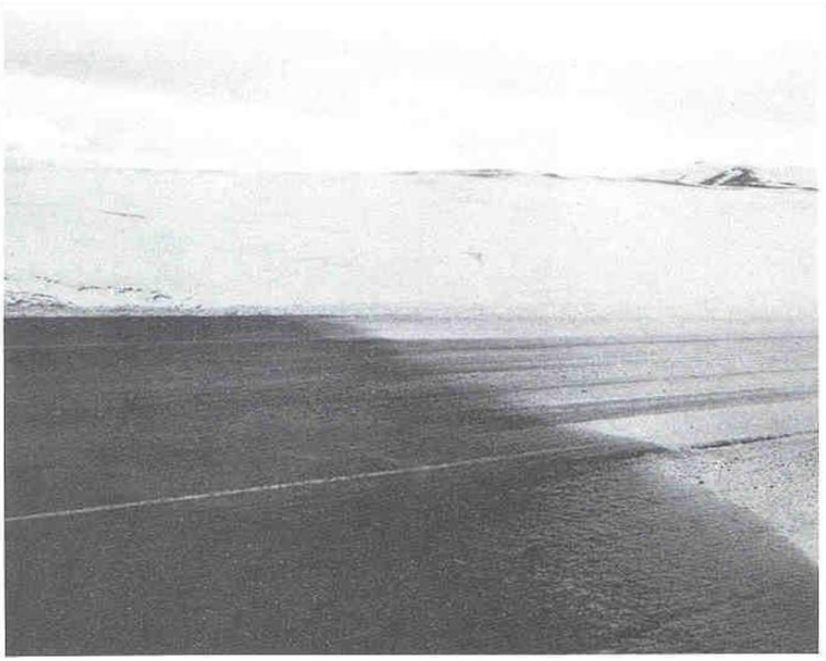


Figure 6.2 – Transition from frozen slush to wet pavement corresponds to the beginning of the area protected by a 12.4-ft snow fence located about 500 ft upwind.
Source: Tabler, Ronald D., 1991. Snow Fence Guide. Strategic Research Program, National Research Council Washington, DC

[36] Tabler, Ronald D., 1991. Snow Fence Guide. Strategic Research Program, National Research Council Washington , DC page 3

The density of the proposed wind break, anticipated wind speeds, and topographical factors determine how far from the protected area (the highway) the snow/wind fence should be placed as well how high it should be. According to the USDA's Natural Resources Conservation Service, every additional foot of fence height causes sediment to be deposited 8-10 feet farther leeward of the fence. A 4 foot high fence would, therefore, cause wind-blown soil or snow particles to pile about 30-40 ft. downwind of the fence.

Alternatives

Living Snow Fences/Wind Breaks

A living snow fence consists of rows of trees and /or shrubbery to decrease wind speed. Any number of rows may be planted, but at least two are recommended to allow for higher density.

A living wind break was installed in the Salmon Tract in Twin Falls County. The project was carried out in cooperation with the NRCS and local land owners, with a 50% cost share. The cost to the NRCS was $3.35/linear foot including all supplies and equipment as well as an installed watering system. Gallon junipers were used for the project.

Living snow/wind fences have benefits that go beyond decreasing wind speed including added landscape aesthetics and increased wildlife habitat.

Advantages

1. Last longer than traditional wooden structures (average. 50-75 years vs. 20-25 years).
2. Improve roadway aesthetics.
3. Provide and enhance wildlife habitat.
4. Relatively maintenance free once established.
5. Average installation and maintenance costs of living barriers have been approximately one seventh that of 12 ft. wooden structures over the life of each.
6. Reduced snow removal costs.
7. Sequester carbon dioxide from the atmosphere.

Disadvantages

1. Living snow fences require more space than slat snow fences.
2. New plantings must be protected from grazing.
3. Time required to obtain adequate snow control is highly variable depending upon site conditions. On average, 5-10 years is required.
4. Site conditions such as shallow soils and pH (acidity or alkalinity) may prohibit plant establishment.
5. May have to replace trees if they are diseased or die.

Manmade Snow Fences

Manmade snow fences are generally constructed of wood and can be post supported or truss type. Post supported fences are supported by steel or wood posts set in the ground. Truss type are anchored with rebar or counterweighted to avoid overturning in the wind. The Truss type is typically less expensive because it can be fabricated off-site. Wyoming Department of Transportation has used a truss type fence successfully since 1971 and has shown it to withstand winds of 100 mph, snow settlement pressures associated with

complete burial on level terrain, and rubbing by animals. When built according to specifications and properly anchored, the Wyoming fence has proven to be durable and relatively maintenance-free for at least 25 years.

In the early 1970's Wyoming began installing snow fences. The initial contract consisted of 11.4 miles of snow fence ranging in height from 6 to 12.4 feet and built at a cost of $480,000 or $7.97/ liner foot. The materials alone would now cost approximately $2-4/linear foot.

Advantages

1. Truss-type is portable and may be relocated.
2. Optimum height is obtained immediately.
3. Less land is required for installation

Disadvantages

1. **A**theistically unpleasing.
2. Can be more expensive initially.

Standing Corn

At least two states have experimented with leaving a number of rows of corn standing in fields adjacent to the highway right-of-way. Experience has shown that this strategy is economically viable. The optimum number of standing corn rows varies with the size of the harvester and the harvesting pattern used by the farmer, but to be effective, the minimum is six to eight rows. The most effective strategy is to use two strips of corn rows separated by 150 to 200 ft. The minimum setback from the road shoulder should be 35 times the height of the standing corn. Owners receive payment for the corn left standing in the field based on the market value for the crop on the day of harvest. Some of the corn left standing can be salvaged in the spring. Costs for such a program in 1984 in one state averaged $1,300/mile or $0.25/linear foot[37].

Advantages

1. No installation cost
2. No maintenance is required.
3. Low cost

Disadvantages

1. Must have cooperation with landowner to continue planting corn.

Cost Estimate

	Living snow/wind fence	Manmade snow/wind fence	Standing Corn
Estimated cost per linear foot	$ 6.70/linear foot	$8.00/linear foot	$0.25/linear foot/year

Table 6.4 – Preliminary Cost Estimates Snow Fences

[37] Tabler, Ronald D., 1991. Snow Fence Guide. Strategic Research Program, National Research Council Washington , DC page 50

Benefit Cost Analysis (BCA)

The BCA will be conducted as part of the engineering design for this project. See the Implementation Roadmap (Line 36)

Funding Options

This project could be funded by a HMA Grant.

Special Note:

Twin Falls County Mitigation Projects:

After review of the hazard profiles and the engineering cost estimates the Twin Falls County Commission has selected the following projects as high priority projects for Twin Falls County.

1. High Wind Closure Signs for the Hansen and Perrine Bridges
2. Living Wind Breaks on Highway 93 between Hollister and Rogerson

Additionally the Commission recommends that the City of Twin Falls examine the Landslide Hazard Profile for Twin Falls City and consider taking action to protect the potable water line and the sewer lines that come out of the Snake River Canyon.

The Twin Falls County All Hazard Mitigation Project Roadmap provides a description of the tasks required to implement funding for these four projects.

Attachments

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Attachment 1
AHMP Committee Minutes

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Twin Falls County All-Hazards Mitigation Plan

AHMP Committee Meeting
Minutes
October 25, 2006

The first meeting of the Twin Falls All Hazard Mitigation Committee was held on October 25, 2006 in the Twin Falls County Court House. The purpose of the meeting was to formally organize the AHMP Committee and to brief committee members on the current progress of the project. The Meeting Agenda is provided as Attachment 1. The meeting was called to order by Jackie Frey, Twin Falls County Coordinator of Emergency Services. Jackie introduced the members of the committee brief members of grant funding and matching requirements. The County is responsible to match 25% of the project using "soft match" funds. The soft match will be accomplished through participation by County, City, and State staff attending meetings, reviewing documentations, and providing valuable input into the development of the AHMP.

Rick Fawcett of Whisper Mountain Professional Services, Inc., the County's subcontractor for the project, introduced the tenants of Hazard Mitigation Planning. He stated the purpose of the Planning Project is to determine methods to reduce property damage and to ensure safety of the County residents from the identified hazards in the County,

Rick introduced Derrick Sharp, Whisper Mountain's Geospatial Analyst. Derrick presented the Graphical Information System (GIS) map of the Twin Falls Hazards. He discussed the collection of Hazard Data including the conduct of a 100 year hazard analysis. The 100 Year Analysis examined all hazardous events reported in Twin Falls County where property damage of loss of life occurred. The hazardous events have been mapped and a data base developed capturing available information. This information will be helpful in determining the potential of future events.

Derrick also discussed the ongoing mapping of hazards and vulnerabilities. The mapping will be largely completed by December 15, 2006 however; as hazards or vulnerabilities are identified they will be added. Additionally, as mitigation projects are identified they will be mapped.

Rick Fawcett then discussed the perception of risk within the community. Rick requested that participants fill out a risk perception tool quantifying their present perceptions of the County risks. The questionnaire and results of provided in Attachment 2. Rick posed a request to mail out a survey to approximately 600 County homeowners to measure their

risk perception and to gain input from them on the risks facing them in their neighborhoods. The public survey was reviewed and comments provided. The revised survey is provided in Attachment 3. Jackie will present the survey to the Twin Falls County Commissioners for approval and them Whisper Mountain will mail out the surveys to Twin Falls County property owners.

Rick discussed the next step in the process which is to develop project goals and objectives. The goals and objectives need to be linked to the identified hazards. Mitigation projects will be used to address the goals and objectives. Individual objectives of each project will be the basis of project requirements. Several examples of mitigation goals and objectives were provided to committee members to review. Overarching goals will be developed at the next meeting.

The meeting concluded with a discussion surrounding who else should be on the committee. Suggestions were made and invitations will be made to additional members. Committee Membership list is provided as Attachment 4.

The next committee meeting will be December 13, 2006 from 10:00 a.m. to Noon at the Twin Falls County Court House in the 3rd floor conference room.

Attachment 1
Committee Agenda

Twin Falls County All-Hazards Mitigation Plan

AHMP Committee Meeting
Agenda

October 25, 2006
10:00 A.M. – 12:00 Noon

Introductions: **Jackie Frey, Committee Chair**

Purpose of All Hazard Mitigation: **Rick Fawcett**

Hazard and Vulnerability Mapping: **Derrick Sharp**

- ❑ **Base Data**
- ❑ **Historical Events**
- ❑ **Weather Related Events**

Hazard Perception: **Rick Fawcett**

- ❑ **Committee Questionnaire**
- ❑ **Public Questionnaire Review and Approval**

Setting Mitigation Goals – An Event? **Rick Fawcett**

- ❑ **Examples**
- ❑ **Assignment**

Next Meeting

Thank you for your participation!

Attachment 2
Committee Risk Perception

	What is the probability (%) that the hazard event will occur in Caribou County in the next ten years? (Mark 1 for each hazard)										What would be the impact or consequence[1] if the hazard event did occur? (Mark 1 for each hazard)				
	<10	20	30	40	50	60	70	80	90	100	Low		Med		High
Biological	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Dam failures	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Droughts	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Earthquakes	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Extreme heat	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Fires	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Floods	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Hazardous materials events	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Landslides/Mudslides	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Nuclear accidents	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Rioting or Large demonstrations	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Sever winter storms	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Snow avalanches	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Terrorism	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Thunderstorms, Hailstorms, Lightening, High Winds and Tornadoes	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Volcanoes	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Wildland fires	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

[1] Low = Little or no impact to life or property. Med = Some property damage or impact to health. High = Significant property damage or loss of life.

Twin Falls County	Probability of Occurrence in Next 10 Years By Percentage									
Hazard Type	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Biological	2	2	1	1			2	1	1	
Dam Failure	5	3		1			1			
Droughts	1				4	1		2		2
Earthquakes	5		1	1		1	1	1		
Extreme Heat			1		3	2	2	1	1	
Fire (Structure)		2	1	1				2	1	3
Floods		1	1	1	3			1	1	2
Hazardous Materials Events	1	1		1	1	1	1	2		2
Landslides/Mudslides	1		4	2	3			1		2
Nuclear Accidents	6	3	1							
Rioting or Large Demonstrations	7		3							
Severe Winter storm					4	1		1	1	3
Snow Avalanches	4	2		2			2			3
Terrorism	4	2	2			2				
Thunderstorms, Hailstorms, Lightening, High winds, Tornadoes					1	1	1	1	1	5
Volcanoes	9	1								
Wildland Fires					1	2		2		5

Level of Impact if Event Occurred					
Hazard Type	**low**	**low-med**	**med**	**med-high**	**high**
Biological		2	4		4
Dam Failure	2		2	1	5
Droughts	1	2	4		3
Earthquakes	3	1	3	2	1
Extreme Heat	2	1	3	3	1
Fire (Structure)	2	3	3	2	
Floods	1		6	2	1
Hazardous Materials Events	3	1	3	2	1
Landslides/Mudslides	4	4	2		
Nuclear Accidents		2	2	1	5
Rioting or Large Demonstrations	7	2	1		
Severe Winter storm	2	1	4	1	2
Snow Avalanches	8	2			
Terrorism	4	1	2	1	2
Thunderstorms, Hailstorms, Lightening, High winds, Tornadoes		2	4	1	3
Volcanoes	4	1		2	3
Wildland Fires		3	5	2	

Attachment 3
Public Survey

Twin Falls County All-Hazards Mitigation Plan

Public Participation Questionnaire

November 2006

Dear Twin Falls County Resident,

We need your help! Twin Falls County is embarking on an initiative to assist communities in reducing risk from natural and man-made hazards. This questionnaire is designed to help us understand your perceptions of those hazards. We are developing a strategic plan to prioritize activities to assist Twin Falls County communities and residents to reduce their risk from natural and man-made disasters. The information you provide will help improve coordination of risk reduction activities within the County.

Your returned survey indicates your willingness to take part in the study. Your participation in this study is voluntary. All individual survey responses are strictly confidential, and are for research purposes only.

Your opinions are important to us. Please return your completed survey no later than TBD, November TBD 2006 to our technical consultant on this project Whisper Mountain Professional Services, Inc. at 1455 E. Cedar, Pocatello, Idaho, 83201 in the stamped, addressed, return envelop provided.

If you have questions regarding the survey, feel free to contact the Whisper Mountain Professional Service, Inc. at (208) 478-7982.

Thank you for your participation!

Sincerely,

Jackie Frey,
Coordinator,
Twin Falls County
Emergency Services

1. What town do you live in or near? _____

2. Have you ever experienced or been impacted by a disaster (a sudden event bringing great damage, loss, or destruction)?

- ❑ Yes (please explain**):**_____
- ❑ No

3. How concerned are you about the possibility of our community being impacted by a disaster?

- ❑ Extremely concerned
- ❑ Somewhat concerned
- ❑ Not concerned

4. Please select and rank the five (5) highest hazards facing your neighborhood:

- ❑ Blizzards/Ices Storms/Winter Storms
- ❑ Hail
- ❑ Storm Water Erosion
- ❑ Hazardous Materials
- ❑ Dam Failure
- ❑ Land Subsidence (e.g. sinkhole)
- ❑ Drought
- ❑ Landslide/Mudslide
- ❑ Earthquake
- ❑ Lightening
- ❑ Expansive Soils
- ❑ Nuclear
- ❑ Extreme Cold
- ❑ Terrorism (bombs/biological/chemical)
- ❑ Extreme Heat
- ❑ Tornadoes
- ❑ Fires
- ❑ Volcanoes
- ❑ Air Quality
- ❑ Flooding – Canal
- ❑ Flooding – Flash (Ravine)
- ❑ Wildland Fires
- ❑ Insect Infestations
- ❑ High Wind / Wind Storms
- ❑ Other (please explain):

5. Is there a hazard not listed in this survey that you think is a wide-scale threat to your neighborhood?

- ❑ Yes (please explain):_____
- ❑ No

6. Is your home located in a floodplain?

- ❑ I don't know
- ❑ Yes
- ❑ No

7. Do you have flood insurance?

- ❑ I don't know
- ❑ Yes
- ❑ No

If "No", why not?

- ❑ Not located in a floodplain
- ❑ Too expensive
- ❑ Not necessary because it never floods
- ❑ Not necessary because I'm elevated or otherwise protected
- ❑ Never really considered it

- ❑ Other (please explain):

8. Have you taken any actions to make your home or neighborhood more resistant to hazards?

- ❑ Yes
- ❑ No

If "Yes", please explain:

_____
_____
_____

9. Are you interested in making your home or neighborhood more resistant to hazards?

- ❑ Yes
- ❑ No

10. What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards?

- ❑ Newspaper
- ❑ Television
- ❑ Radio
- ❑ Internet
- ❑ Mail
- ❑ Public Workshops/meeting
- ❑ Other (please explain):

11. In your opinion, what are some steps your county or city government could take to reduce or eliminate risk of future hazard damages in your neighborhood?

_____
_____
_____
_____
_____
_____
_____
_____

12. Are there any other issues regarding the reduction of risk and loss associated with hazards or disasters in the community that you think are important?

_____
_____
_____
_____
_____
_____
_____
_____

13. A number of community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories. Please tell us how important you think each one is for your community to consider pursuing. (See next page)

1. Prevention
Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain regulations.

- ❑ **Very Important**
- ❑ **Somewhat Important**
- ❑ **Not Important**

2. Property Protection
Actions involve the modification of existing buildings to protect them from a hazard or removal from the hazard area. Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.

- ❑ **Very Important**
- ❑ **Somewhat Important**
- ❑ **Not Important**

3. Natural Resource Protection
Actions that, in addition to minimizing hazard losses also preserve or restore the functions of natural systems. Examples include: floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management.

- ❑ **Very Important**
- ❑ **Somewhat Important**
- ❑ **Not Important**

4. Structural Projects
Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include dams, levees, canals, detention/retention basins, channel modification, retaining walls and storm sewers.

- ❑ **Very Important**
- ❑ **Somewhat Important**
- ❑ **Not Important**

5. Emergency Services
Actions that protect people and property during and immediately after a hazard event; examples include warning systems, evacuation planning, emergency response training, and protection of critical emergency facilities or systems.

- ❑ **Very Important**
- ❑ **Somewhat Important**
- ❑ **Not Important**

6. Public Education and Awareness
Actions to inform citizens about hazards and the techniques they can use to protect themselves and their property. Examples include outreach projects, school education programs, library materials and demonstration events.

- ❑ **Very Important**
- ❑ **Somewhat Important**
- ❑ **Not Important**

THANK YOU FOR YOUR PARTICIPATION

Attachment 4
AHMP Committee

Twin Falls County
AHMP Committee Members
Attendees October 25, 2006

Agency	Representative	Position
TFCO Emergency Service	Jackie Frey	Coordinator
TFCO Commission	Gary Grindstaff or Tom Mikesell	Chairman
TFCO Planning and Zoning	Sue Switzer	Administrator
TFCO Extension	Charlotte Eberlein	Agent
Twin Falls Highway District	Dave Burgess	Engineer or Supervisor
Buhl Highway District	Harold Miller or John Zamora	Engineer or Supervisor
Filer Highway District	Pat Scheer	Engineer or Supervisor
Murtaugh Highway District	Carl Gooch	Engineer or Supervisor
Twin Falls Canal Company	Vince Alberti or Brian Olmstead	Manager
Eastern Idaho Railroad		Safety
Williams Pipeline	Fred Link	Safety
Chevron Pipeline		Safety
Idaho Power	Dan Olmstead	Operations
Intermountain Gas	Rick Moore	Operations
City of Twin Falls	Lance Bates	Public Works
City of Filer	Bud Compher	Public Works
City of Castleford	Rita Ruffing	Public Works
South Central District Health	Cheryl Juntunen	Director
Idaho State Police	Robert Storm	
Idaho Department of Transportation		District Engineer
Idaho Bureau of Homeland Security	Terry Bingham	Field Officer
Bureau of Land Management		
Forest Service	Buz Vanskike	Fire Management
Twin Falls Council on Aging	Jim Fields	Representative
General Public/Rock Creek	James Gose-Eells	
Idaho Department of Health and Welfare	John Hathaway	
Department of Environmental Quality	Bill Allred	
College of Southern Idaho	Jerry Beck or Doug Maughn (PIO)	

Twin Falls County All-Hazards Mitigation Plan

AHMP Committee Meeting
Minutes
December 13, 2006

The second meeting of the Twin Falls County All Hazard Mitigation Committee was held on December 13, 2006 in the Twin Falls County Court House. The purpose of the meeting was to brief the AHMP Committee on current progress of the Twin Falls County Hazard Assessment Process and to begin to develop goals and objectives to address the Hazards. The Meeting Agenda is provided as Attachment 1. The Attendance Roster is provided as Attachment 2. The meeting was called to order by Jackie Frey, Twin Falls County Coordinator of Emergency Services.

Rick Fawcett of Whisper Mountain Professional Services, Inc., the County's subcontractor for the project, reviewed the purpose of Hazard Mitigation Planning. He stated the purpose of the Planning Project is to determine methods to reduce property damage and to ensure safety of the County residents from the identified hazards in the County,

Rick presented the updated Graphical Information System (GIS) map of the Twin Falls County Hazards. He discussed the collection of additional Hazard Data including the modeling of a 7.0 earthquake on the active fault located in the canyon floor at Shoshone Falls. A summary of the damage is presented as Attachment 3.

Rick then facilitated a discussion centered on the committee's perception of risks facing Twin Falls County. The Risks discussed include the following:

- Severe Weather
  - High Winds
  - Dust Storms
  - Lightning
  - Snow
- Low Level Earthquakes
- Dairy Waste
- Land Fills
- Wildland Fires
- Floods
  - Flash
  - Snow Melt
  - Sheet Flooding
- Pandemics

    - West Nile Virus
- Insects
- Wolves
- Varmints
- Hazardous Materials

A discussion was held on various flooding issues tied to new development and possible ways to manage flooding caused by storm water runoff in new subdivisions. One possible mitigation alternative would be an ordinance governing runoff capture and disposal.

A mitigation project was discussed for the high wind risk at the Hansen Bridge on the Snake River Canyon. One possible alternative is a wind gauge that could be programmed to close the bridge to high profile vehicles. This alternative would need to be worked with the Idaho Transportation Department.

A request was made by the Committee to place all dairies in the County on the GIS Hazard/Vulnerability Map. There was also a discussion regarding the location of private wells and septic systems. Whisper Mountain will work with the Health District to see if locations are documented.

Rick Fawcett then discussed the completion of the identification of worst case isolation zones for those facilities who have reported chemicals under the Tier II reporting system. A complete listing of those chemicals and the protective action distances will be distributed with these meeting minutes.

The remainder of the meeting was focused on the development of goals and objectives that will be developed to address the risk posed by the hazards in the County. Rick will develop a draft set of goals and objectives and email them out to the committee to review at least a week prior to the next meeting.

The Committee completed their second version of the Risk Perception Tool. Results are included as Attachment 4.

The next meeting will be January 19, 2007 at 10:00 A. M. at the Twin Falls Court House in the 3rd Floor Conference Room

Twin Falls County
AHMP Committee Meeting
December 13, 2006

Agency	Representative	Position
TFCO Emergency Service	Jackie Frey	Coordinator
City of Twin Falls	Lance Bates	Public Works
City of Filer	Bud Compher	Public Works
Idaho State Police	Robert Storm	
Idaho Bureau of Homeland Security	Gary Davis	Field Officer
Idaho Department of Health and Welfare	John Hathaway	

Twin Falls County All-Hazards Mitigation Plan

AHMP Committee Meeting
Minutes
January 19, 2007

The third meeting of the Twin Falls County All Hazard Mitigation Committee was held on January 19, 2007 in the Twin Falls County Court House. The purpose of the meeting was to discuss and identify as many existing and potential hazards in the County that are, or could become, a risk to the population or their property. The meeting was called to order by Jackie Frey, Twin Falls County Emergency Services Coordinator. Jackie introduced the members of the committee and made it clear that all comments and ideas about existing and potential risks were encouraged and valuable for the development of the AHMP.

Rick Fawcett, of Whisper Mountain Professional Services, Inc., the County's subcontractor for the project, reviewed that the purpose of the Planning Project is to determine methods to reduce property damage and to ensure safety of the County residents from the identified hazards in the County. He then facilitated a discussion with the committee about the risks they could identify in the County.

The following were discussed as areas of concern:

- Twin Falls has several areas of vulnerable population. Silver Jacobsen of South Central District Health may have a list of identified populations at risk and their locations.

- There is a need to identify key facilities that would be used for relocation of the population or as alternate health care facilities, and schools and hospitals currently in use to assure these facilities have alternate power sources (generators) and are located in safe and accessible areas. Sheltering facilities do not have back up power at present. There is currently a propane tank at the Magic Valley Regional Medical Center that is used for powering the incinerator. It could possibly be used to power a generator if needed.

- The Melon Valley area has a high fuel load and high vulnerable population. This area should be a priority for fuel reduction. There is no riparian ground in the Melon Valley but it has a good mix of types of ground. Melon Valley has its own fire department.

- Lamb Weston is one of the largest commercial industries in the area. It stores and uses a variety of Hazardous Materials and also has Rail Road interception and a Salvage Yard.

- The Sewer Pump Station has emergency power back-up.

- A study of the fault on the bottom of the canyon should be looked at. The two sides of the bridge was said to have shifted 7 inches the last time it was repaired.

- The Rock Creek area has historic high winds and thunderstorms. Are there current building ordinances to litigate building codes to accommodate these high winds? Lightning rods?

- Rock Creek experienced flooding in 1984 due to a square culvert unable to handle 1,000 CFS water flow. This culvert is where Goose Creek and Rock Creek intercept in route to the Hiline Canal. If the waters are diverted to other areas to reduce the flow, those areas flood. Water has been diverted to McMullen Creek but it flooded, and there is a current plan in place to build 2,500 homes in that flood plain.

- New homes being built in the area cause greater areas of impervious surfaces and may alter the natural water flow. New areas of development should have required areas of water detainment. Would the developer or the home-owners be responsible for construction and maintenance of these detainment ponds?

- What is the process for litigation of goals and supporting ordinances? Does the comprehensive plan provide foundation for this process? What is the land use objective?

- Canal breaks would cause extensive flood damage. Historical intermittent stream beds should be identified.

- Shoshone Falls has a need for increased fire water supplies.

- It is unknown if the Mid-Point sub-station north of Jerome and Shoshone has an alternate power loop.

- Highway 93 south is a highly vulnerable area to high winds, dust storms, and show drifts. The area between Hollister and Rogerson are the most susceptible areas. March, April, and May are the worst months for the high winds. There is no signage or indicators for the high winds to warn travelers.

- There are high winds on the bridges, and especially affecting Hansen Bridge. There have been trucks blown over. Electronic warning signs activated upon high wind occurrence could restrict or at least warn those traveling over the bridges.

- Flood maps are outdated and FEMA has indicated it may be several years before they are updated. Flood insurance for the County also needs to be updated.

- The County is supplied with water from the City Pipeline. The pipeline was installed in 1994 and was designed to carry 3400 CFS crossing the Snake River west of the bridge. The wells are on the Blue Lake side and the water is pumped back to the city up out of the canyon. Power outage would be a huge problem as it would also mean a water outage. There is currently no back-up power. Back-up power to the lift pumps in the canyon is a critical issue. There could be some water brought out of Harrison Reservoir at a very low pressure, however it may not be enough pressure for fire protection.

Rick said our attorneys will look at the City and County ordinances to address the need for recommended changes and additions as the County is growing and this growth is mandating hazard mitigation.

All goals and objectives were not identified at this meeting due to new information that was shared. Developing those goals and objectives will be the next process. They will then be linked to the identified hazards. Specific mitigation projects will be used to address the goals and objectives. Individual objectives of each project will be the basis of project requirements.

Rick requested that participants fill out a risk perception tool quantifying their present perceptions of the County's risks. This is the same tool they filled out at the last meeting. This is done to see if their perception of risk has changed due to the discussion at each meeting. The questionnaire and results are provided in Attachment 1.

The proposed survey for the 300 County homeowners to measure their risk perception and to gain input from them on the risks facing them in their own neighborhoods was approved by the commissioners and was mailed out. Those results will be recorded as they are received back.

The meeting concluded with Jackie Frey posing the question, "How do we measure goals?" She encouraged everyone to contemplate this and also think about what hazard issues could affect several counties at once. She thanked members of the committee for their valuable contributions to the meeting.

The next meeting will be March 15, 2007 at 10:00 am at the Twin Falls Court House in the 3rd floor conference room.

Attachment 1
Perception Worksheet Results

Twin Falls County	Probability of Occurrence in Next 10 Years By Percentage									
Hazard Type	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Biological	2	3	1	0	1	0	0	0	0	0
Dam Failure	3	2	0	0	0	1	0	0	0	0
Droughts	0	0	0	1	0	0	1	0	1	4
Earthquakes	4	0	0	1	1	0	0	0	0	0
Extreme Heat	0	1	0	0	3	1	0	1	1	0
Fire (Structure)	0	0	0	0	2	0	1	0	1	3
Floods	0	1	1	1	1	2	0	0	0	1
Hazardous Materials Events	1	1	1	2	0	1	0	0	0	1
Landslides/Mudslides	2	0	2	0	1	2	0	0	0	0
Nuclear Accidents	4	2	1	0	0	0	0	0	0	0
Rioting or Large Demonstrations	5	2	0	0	0	0	0	0	0	0
Severe Winter storm	0	0	2	0	0	1	1	1	0	2
Snow Avalanches	0	1	3	1	0	1	0	0	0	1
Terrorism	4	0	1	2	0	0	0	0	0	0
Thunderstorms, Hailstorms, Lightening, High winds, Tornadoes	0	0	0	0	1	1	1	1	0	3
Volcanoes	5	0	1	1	0	0	0	0	0	0
Wildland Fires	0	0	0	1	0	0	1	1	0	3

Level of Impact if Event Occurred					
Hazard Type	**low**	**low-med**	**med**	**med-high**	**high**
Biological	1	2	0	0	4
Dam Failure	0	0	5	1	1
Droughts	1	1	3	1	1
Earthquakes	0	0	2	2	3
Extreme Heat	2	0	4	1	0
Fire (Structure)	1	2	1	2	1
Floods	0	1	3	2	1
Hazardous Materials Events	1	1	3	1	1
Landslides/Mudslides	2	3	0	1	3
Nuclear Accidents	1	0	2	0	3
Rioting or Large Demonstrations	4	2	1	0	0
Severe Winter storm	0	3	3	0	1
Snow Avalanches	2	3	2	0	0
Terrorism	2	2	2	0	1
Thunderstorms, Hailstorms, Lightening, High winds, Tornadoes	1	1	2	2	1
Volcanoes	2	1	1	1	2
Wildland Fires	1	1	3	2	0

Twin Falls AHMP Committee
Attendance
January 19, 2007

Agency	Representative	Position
TFCO Emergency Service	Jackie Frey	Coordinator
TFCO Extension	Charlotte Eberlein	Agent
City of Twin Falls	Lance Bates	Public Works
South Central District Health	Rene LeBlanc Karen Goodale Georgia Ford	Director
Idaho State Police	Robert Storm	
Idaho Department of Health and Welfare	John Hathaway	

Twin Falls County
AHMP Committee Members
Attendance Roster March 15, 2007

Agency	Representative	Position
TFCO Emergency Service	Jackie Frey	Coordinator
TFCO Planning and Zoning		Administrator
Idaho State Police	Robert Storm	
Idaho Bureau of Homeland Security	Gary Davis	Field Officer
Idaho Department of Health and Welfare	John Hathaway	
Department of Environmental Quality	Bill Allred	

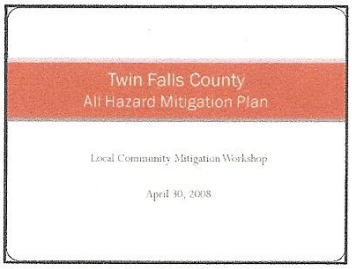
Twin Falls County
AHMP LEPC Briefing
Attendance October 2, 2007

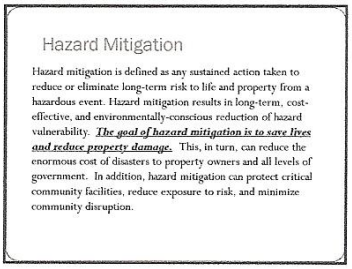
Agency	Representative	Position
TFCO Emergency Service	Jackie Frey	Coordinator
Kimberly School District	Ted Wasko	
Magic Valley Paramedics	Gilbert Schmidt	Coordinator
Twin Falls Sheriff's Office	Steve Nutting	Deputy
American Red Cross	Cathi Leeming	Coordinator
Twin Falls City Police	Dan Lewin	Officer
St. Luke's Magic Valley Medical	Doug Lee	
FHS	Yolanda Cabello	
Buhl Fire Department	Earl Tyree	Chief
SIRCOMM	Linda Lickely	Supervisor
Buhl Police	Eric Foster	Officer
St. Luke's Magic Valley Medical	Marlene Rodger	
South Central District Health	Georgia Ford	Planner
Idaho State Police	Robert Storm	
Idaho Bureau of Homeland Security	Gary Davis	Field Officer
Idaho Department of Health and Welfare	John Hathaway	

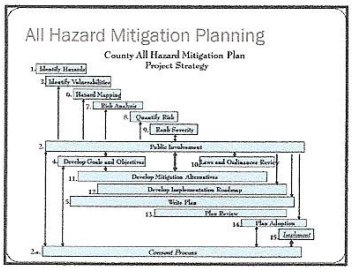
Twin Falls County
AHMP Local Community Mitigation Workshop
April 30, 2008

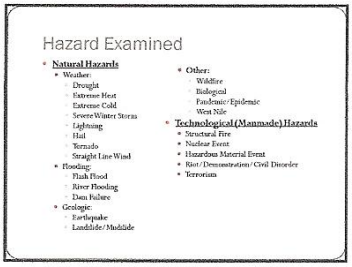
Agency	Representative	Position
TFCO Emergency Service	Jackie Frey	Coordinator
TFCO Commission	Tom Mikesell	Commissioner
TFCO Cmmission	Terry Kramer	Commissioner
TFCO Planning and Zoning	Rick Dunn	Administrator
SIRCOMM	Linda Lickley	Supervisor
Twin Falls City Police	Brain Price	Officer
Rob Wright	City of Kimberly	
SIRCOMM	John Moore	

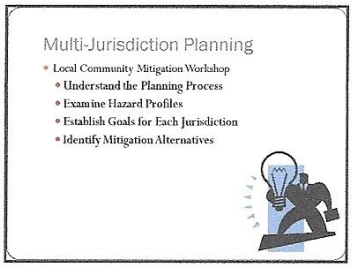
Local Community Mitigation Workshop Presentation Slides

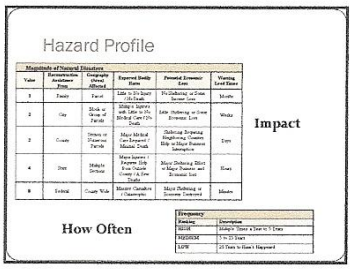


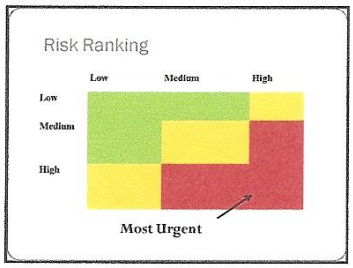


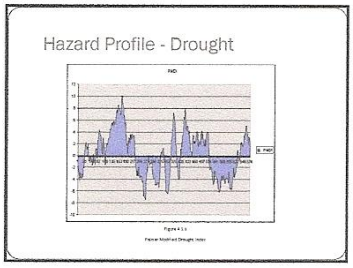


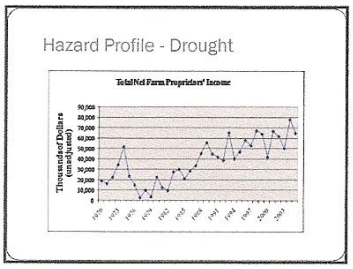




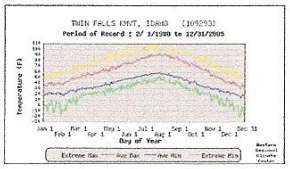




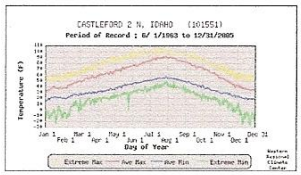




Hazard Profile – Extreme Heat



Hazard Profile – Extreme Cold



Hazard Profile – Winter Storm

Place	Date	Magnitude/details
	Jan 17, 1915	Heavy rain that turned to sleet/snow with winds ~ 50 mph. Power outages.
	Mar 1, 1917	Winter storm that resulted in several feet snow inches. One of the snow slides inflicted severe injuries on a resident
	Jan 21, 1930	Winter storm that lasted a few days. Roads closed because of drifting snow
Murtaugh	Feb 8, 1949	Freezing temps, saw fatality
	Jan 8, 1959	Blizzard with winds over 70 mph. Power failures, highway and airport closures
	Jan 22, 1999	Winter storm with heavy snow throughout southeast. 2-3 inches fell in Southern Twin Falls County.
	Feb 9, 1999	Freezing rain, light snow and gusty winds produced hazardous driving conditions in Southern Twin Falls County. About 30 minor accidents and slide off, occurred and authorities had to close I-84 for a few hours.
	Dec 1, 1999	Winter Storm moving from the North Pacific across brought 3-4 inches of snow to Southern Twin Falls County
	Jan 24, 2001	Winter Storm with 3-6 inches of snow in Southern Twin Falls County
	Dec 28-29, 2002	A major winter storm through southwest with 6-12 inches of new snow. Strong winds/snow/blowing and drifting.
	Feb 20, 2004	Winter storm moving north from brought 7 inches of snow in Southern Twin Falls County.
	Jan 8, 2005	14 inches of snow fell on Southern Twin Falls County. The trailing cold front caused driving windchilling the
	April 20, 2005	8-12 inches of snow fell behind a cold front
	Dec 20, 2005	Winter storm with heavy snow
	Dec 21, 2006	Winter storm with heavy snow
	Feb 27, 2007	Winter storm with 4-5 inches of snow in Southern Twin Falls County
	Mar 27, 2007	Winter storm

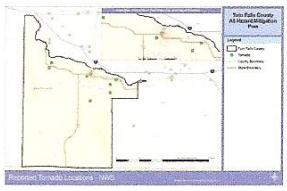
Hazard Profile - Lightning

Place	Date	Magnitude/details
Hollister	May 23, 1911	One fatality
Filer	June 4, 1913	Struck a house, one fatality
	July 22, 1913	One fatality, destroyed haystacks and killed several horses
	June 18, 1918	Struck a house, no fatalities
	July 23, 1923	Struck a home and burned to ground
Rogerson	July 29, 1942	Started fire
Buhl	July 30, 1946	Power outages, struck and killed 7 cows
	May 19, 1962	Struck irrigation pump

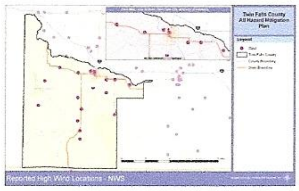
Hazard Profile - Hail

Place	Date	Time	Magnitude	Reported Damage
	6/27/1961	8:00 PM	1.50 in.	unk
	6/15/1967	6:00 PM	unk	unk
	6/27/1967	6:00 PM	0.75 in.	unk
	7/21/1975	5:00 PM	2.00 in.	unk
	8/16/1978	1:00 PM	1.75 in.	unk
	8/16/1979	1:00 PM	1.00 in.	unk
	6/14/1988	5:45 PM	0.75 in.	unk
	7/14/1989	2:30 PM	1.75 in.	unk
	4/20/1987	2:30 PM	1.00 in.	unk
	4/4/1991	1:30 PM	0.75 in.	unk
	5/17/1991	6:35 PM	0.75 in.	unk
	10/11/1991	5:35 PM	unk	unk
Rogerson	6/13/1996	2:00 PM	1.00 in.	unk
Murtaugh	6/18/1996	1:00 PM	0.75 in.	unk
Rogerson	6/27/1996	8:30 PM	0.75 in.	unk
Kimberly	5/31/1997	2:35 PM	0.75 in.	unk
	8/7/1997	6:30 PM	0.75 in.	unk
Hollister	8/13/1997	2:30 PM	0.75 in.	unk
Rogerson	8/6/1997	2:55 PM	1.25 in.	unk
City of	5/16/1998	1:25 PM	0.75 in.	unk
	6/25/1998	1:20 PM	1.00 in.	unk
	8/5/1998	2:40 PM	0.88 in.	unk
Hollister	6/20/2004	2:55 PM	1.00 in.	unk
City of	5/5/2005	5:05 PM	0.75 in.	$5,000
Rogerson	5/29/2005	1:20 PM	0.75 in.	$5,000
	6/25/2005	2:35 PM	0.75 in.	unk
Hollister	8/5/2006	11:15 AM	0.88 in.	unk
	7/6/2006	2:45 PM	0.88 in.	unk

Hazard Profile - Tornado



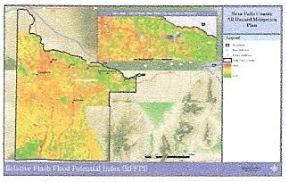
Hazard Profile – Straight Line Wind



Hazard Profile – Flash Flood

Place	Date	Magnitude/details
Rock Creek	July 25, 1913	Water 2 feet above high water within a couple hours. Road washed out
	Sept 3, 1945	Basements and gutters flooded
Three Creek	June 20, 1963	Roads flooded on Roseworth tract
Filer/Twin Falls	June 7, 1996	Flooding on highway
	Aug 7, 1997	Minor street flooding in
Hollister	June 8, 2006	Flooding on highway
Rogerson	July 25, 2006	Flooding on road/ road closed

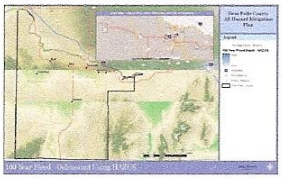
Flash Flood – Hazard Profile



Flash Flood – Loss Estimates

- Flood Depth – 1 foot average
- Residential Parcels impacted – 9,229
- Total parcels impacted – 17,198
- Total number of residents impacted – 2,307
- Maximum value of an individual parcel in flash flood prone areas - $4,103,670
- Average parcel value - $31,654
- Total valuation of all property in flood plain - $544,388,269
- Total Potential Building Loss - $81,660,000
- Total Potential Contents Loss - $122,490.000
- Functional down time for each damaged structure – 23 days
- Displacement time for each damaged structure – 134 days

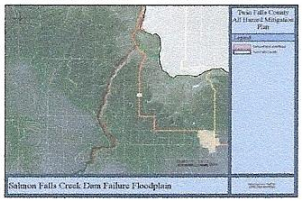
Hazard Profile - Flooding



Flooding - Loss Estimates

- Flood Depth of 2 feet average
- Residential Parcels impacted – 639
- Total Parcels impacted – 2182
- Total number of residents impacted – 1598
- Maximum value of an individual parcel in flood plain - $3,385,401
- Average parcel value - $30,409
- Total Valuation of all property in Flood Plain - $66,352,373
- Total Potential Building Loss – $13,270,000
- Total Content Loss - $19, 906,000
- Function Functional down time for each damaged structure – 30 days
- Displacement time for each damaged structure – 230 days

Hazard Profile – Dam Failure



Dam Failure – Loss Estimates

Total exposure according to FEMA's HAZUS Flood Model is $34,792,000.

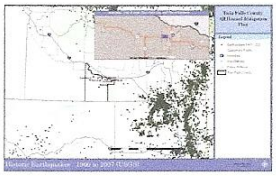
Expected Building Damage
4 Residential Structures
No Damage to Essential Facilities

The model estimates that there will be 275 Tons of debris generated.

One person is expected to be displaced out of a total impacted population of 11,729.

The total estimated economic loss is $720,000.

Hazard Profile – Geological

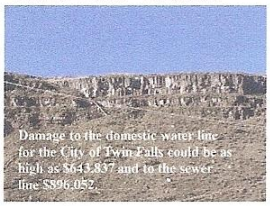


Earthquake Loss Estimates

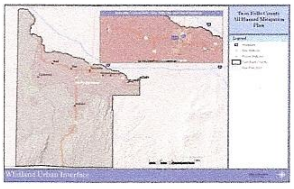
Using the HAZUS, analysis loss estimates were updated using 2007 Twin Falls County assessed valuations. The following information was derived:

Residential Parcels impacted – 24,662
Total Parcels impacted – 37,721
Total number of residents impacted – 61,655
Maximum Value of single impacted Parcel - $4,103,670
Total property value in impact area - $1,240,000,122

Hazard Profile - Landslide



Hazard Profile - Wildfire

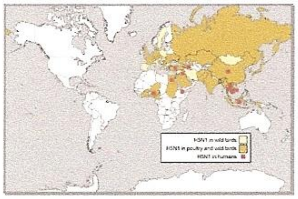


Wildfire Loss Estimates

Residential parcels impacted – 24,576
Total parcels impacted – 37,721
Maximum value of a single impacted parcel - $4,103,670
Total Value of Property in the WUI Area - $1,219,382,497

Hazard Area	Potential Property Losses
Melon Valley – Carter Pack Road	$8,498,201
Banbury Hidden Landing Area	$1,935,180
Southwest Corner of the Filer Fire District	$4,166,048
Snake River Canyon Rim	$61,808,685
- Dierkes Lake and Hidden	$14,662,549
- Rock Creek Park and Rock Creek Parkway	$43,214,718
The Community of Rock Creek	$2,077,910
Pleasant Valley	$11,364,185
The City of Hollister	$2,487,783
The Community of Rogerson	$714,675
Hanmaha Fork of Big Creek	$488,223
Communities outside Rural Fire Protection Districts	$94,157,288

Hazard Profile - Pandemic



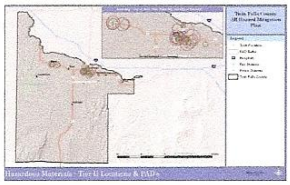
Hazard Profile – West Nile Virus

Date	Human	Horse	Bird	Mosquitoes
2004	0	1	0	
2005	1	1	0	
2006	39	22	11	Not Tested
2007	3	0	0	Positive

Hazard Profile – Structure Fire

Structural Fire History of Fire Departments 2006			
Department Name	Fire Calls	Total Calls	Loss
Buhl FPD	102	214	$223,747
Castleford FD	0	0	None reported
Filer FD	39	132	None reported
Hansen City FD	3	9	None reported
Kimberly FD	9	31	$171,000
Rock Creek Rural Fire Dist	54	172	$319,050
Salmon Tract Rural FPD	0	0	None reported
Twin Falls FD	184	2,112	$1,870,407

Hazard Profile – Hazardous Materials



Magnitude Scoring

Committee Perception
1. Biological
2. Earthquakes
3. Extreme Heat
4. Floods
5. Nuclear Accidents

Public Perception
1. High Winds/Hail Storms
2. Drought
3. Blizzards
4. Air Quality
5. Infections Disease

Twin Falls County Magnitude Ranking	
Hazard	Magnitude
Earthquake	20
Terrorism	20
Wildfire	20
Nuclear	20
Epidemic	19
Drought	18
Winter Storm	16
Hazardous Materials	16
Flash Flood	15
Tornado	15
Dam Failure	15
Hail	14
Structural Fire	14
Straight Line Wind	13
River/stream Flooding	13
Lightning	12
Extreme Cold	11
Landslide	11
Extreme Heat	10
Riot/Demonstration	10
West Nile Virus	7

Risk Ranking - County

	Low	Medium	High
Low	Extreme Heat Extreme Cold Riot/Demonstration	Dam Failure	Earthquake Nuclear Terrorism Epidemic Drought
Medium	Landslide	Flash Flood River/Stream Flooding Tornado	Winter Storm
High	Lightning West Nile Virus	Straight Line Wind Structural Fire Hazardous Materials Hail	Wildfire

Risk Ranking – Twin Falls

	Low	Medium	High
Low	Extreme Heat Extreme Cold Riot/Demonstration	Dam Failure	Earthquake Nuclear Terrorism Epidemic Drought
Medium	Landslide	Flash Flood River/Stream Flooding Tornado	Winter Storm
High	Lightning West Nile Virus	Straight Line Wind Structural Fire Hazardous Materials Hail	Wildfire

Risk Ranking – Buhl

	Low	Medium	High
Low	Extreme Heat Extreme Cold Riot/Demonstration Landslide	Earthquake	Nuclear Terrorism
Medium	Dam Failure	River/Stream Flooding	Winter Storm Hail Tornado Flash Flood Epidemic
High	Lightning West Nile Virus	Straight Line Wind Structural Fire Hazardous Materials	Wildfire Drought

Risk Ranking – City of Kimberly

	Low	Medium	High
Low	Extreme Heat Extreme Cold Riot/Demonstration Landslide Tornado	Earthquake	Nuclear Terrorism Epidemic
Medium		River/Stream Flooding Dam Failure	Winter Storm Hail Flash Flood
High	Lightning West Nile Virus	Structural Fire Hazardous Materials	Wildfire Drought

Risk Ranking – City of Filer

	Low	Medium	High
Low	Extreme Heat Extreme Cold Riot/Demonstration Landslide	Tornado Earthquake	Nuclear Terrorism
Medium	Dam Failure	Flash Flood River/Stream Flooding	Winter Storm Hail Epidemic
High	Lightning West Nile Virus	Straight Line Wind Structural Fire Hazardous Materials	Wildfire Drought

Risk Ranking – City of Murtaugh

	Low	Medium	High
Low	Extreme Heat Extreme Cold Riot/Demonstratio n Landslide Earthquake	Tornado	Epidemic Nuclear Terrorism
Medium	Dam Failure	Flash Flood	Winter Storm Hail River/Stream Flooding
High	Lightning West Nile Virus	Straight Line Wind Structural Fire Hazardous Materials	Wildfire Drought

Risk Ranking – City of Castleford

	Low	Medium	High
Low	Extreme Heat Extreme Cold Riot/Demonstration Earthquake	Dam Failure	Nuclear Terrorism Epidemic
Medium	Landslide	Flash Flood River/Stream Flooding	Winter Storm Hail Tornado
High	Lightning West Nile Virus	Structural Fire Hazardous Materials	Wildfire Drought Straight Line Wind

Risk Ranking – City of Hollister

	Low	Medium	High
Low	Extreme Heat Extreme Cold Riot/Demonstration Earthquake Landslide Dam Failure		Nuclear Terrorism Epidemic
Medium	River/Stream Flooding Flash Flood	Structural Fire Hazardous Materials	Winter Storm Hail Tornado
High	Lightning West Nile Virus		Wildfire Drought Straight Line Wind

Risk Ranking – City of Rogerson

	Low	Medium	High
Low	Extreme Heat Extreme Cold Riot/Demonstration Earthquake Landslide Dam Failure		Nuclear Terrorism Epidemic
Medium	River/Stream Flooding Flash Flood	Structural Fire Hazardous Materials	Winter Storm Hail Tornado
High	Lightning West Nile Virus		Wildfire Drought Straight Line Wind

Risk Ranking – City of Hansen

	Low	Medium	High
Low	Extreme Heat Extreme Cold Riot/Demonstration Landslide Tornado	Earthquake	Nuclear Terrorism Epidemic
Medium		River/Stream Flooding Dam Failure	Winter Storm Hail Flash Flood
High	Lightning West Nile Virus	Structural Fire Hazardous Materials	Wildfire Drought Straight Line Wind

AHMP Goals – By Hazard

- **Severe Weather**
  - Twin Falls County will develop methods to mitigate the losses due to severe weather in the County.
- **Flooding**
  - Twin Falls County will continue to participate in the National Flood Insurance Program and develop actions that will reduce the damage to County infrastructure due to flash and stream flooding.
- **Geological**
  - Twin Falls County will reduce potential damage to County infrastructure and structures through implementation of earthquake mitigation techniques.
  - Twin Falls County will reduce the potential damage to property from Landslides by adopting codes and standards for construction in landslide prone areas.
- **Wildfire**
  - Twin Falls County will reduce the losses caused by wildfire by continuing the Wildland Urban Interface Mitigation Program.

AHMP Goals – By Hazard

- **Biological**
  - Twin Falls County seeks to reduce the exposure of humans and animals to the West Nile Virus.
  - Twin Falls County will identify risks to livestock from potential biological threats.
- **Structural Fire**
  - Twin Falls County will seek to reduce losses from Structure fires.
- **Nuclear Event**
  - Twin Falls County examine the risks posed to the County from Nuclear Facilities and Improvised Nuclear Devices.
- **Hazardous Material Event**
  - Twin Falls County will identify hazardous materials transported through the County.
- **Riot/Demonstration/Civil Disorder**
  - Twin Falls County will develop methods to identify and report Civil Disobedience activities.
- **Terrorism**
  - Twin Falls County will identify measure to protect critical County infrastructure and facilities from potential terror incidents.

Attachment 2
Public Questionnaire
And
Results

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Twin Falls County All-Hazards Mitigation Plan

Public Participation Questionnaire

January 2007

Dear Twin Falls County Resident,

We need your help! Twin Falls County is embarking on an initiative to assist communities in reducing risk from natural and man-made hazards. This questionnaire is designed to help us understand your perceptions of those hazards. We are developing a strategic plan to prioritize activities designed to assist Twin Falls County communities and residents to reduce their risk from natural and man-made disasters. The information you provide will help improve coordination of risk reduction activities within the County.

Your returned survey indicates your willingness to take part in the study. Your participation in this study is voluntary. All individual survey responses are strictly confidential, and are for research purposes only.

Your opinions are important to us. Please return your completed survey no later than February 15, 2007 to our technical consultant on this project Whisper Mountain Professional Services, Inc. at 1455 E. Cedar, Pocatello, Idaho, 83201 in the stamped, addressed, return envelop provided.

If you have questions regarding the survey, feel free to contact the Whisper Mountain Professional Service, Inc. at (208) 478-7982.

Thank you for your participation!

Sincerely,

Jackie Frey,
Coordinator,
Twin Falls County
Emergency Services

1. What town do you live in or near? _____

2. Have you ever experienced or been impacted by a disaster (a sudden event bringing severe damage, loss, or destruction)?

- ❑ Yes (please explain**):**_____
- ❑ No

3. How concerned are you about the possibility of our community being impacted by a disaster?

- ❑ Extremely concerned
- ❑ Somewhat concerned
- ❑ Not concerned

4. Please select and rank the five (5) highest hazards facing your neighborhood:

- ❑ Blizzards/Ices Storms/Winter Storms
- ❑ Hail
- ❑ Storm Water Erosion
- ❑ Hazardous Materials
- ❑ Dam Failure
- ❑ Land Subsidence (e.g. sinkhole)
- ❑ Drought
- ❑ Landslide/Mudslide
- ❑ Earthquake
- ❑ Lightening
- ❑ Expansive Soils
- ❑ Nuclear
- ❑ Extreme Cold
- ❑ Terrorism (bombs/biological/chemical)
- ❑ Extreme Heat
- ❑ Tornadoes
- ❑ Fires
- ❑ Volcanoes
- ❑ Air Quality
- ❑ Flooding – Canal
- ❑ Flooding – Flash (Ravine)
- ❑ Wildland Fires
- ❑ Insect Infestations
- ❑ High Wind / Wind Storms
- ❑ Other (please explain):

5. Is there a hazard not listed in this survey that you think is a wide-scale threat to your neighborhood?

- ❑ Yes (please explain):_____
- ❑ No

6. Is your home located in a floodplain?

- ❑ I don't know
- ❑ Yes
- ❑ No

7. Do you have flood insurance?

- ❑ I don't know
- ❑ Yes
- ❑ No

If "No", why not?

- ❑ Not located in a floodplain
- ❑ Too expensive
- ❑ Not necessary because it never floods
- ❑ Not necessary because I'm elevated or otherwise protected
- ❑ Never really considered it
- ❑ Other (please explain):

8. Have you taken any actions to make your home or neighborhood more resistant to hazards?

- ❑ Yes
- ❑ No

If "Yes", please explain:

_____
_____
_____

9. Are you interested in making your home or neighborhood more resistant to hazards?

- ❑ Yes
- ❑ No

10. What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards?

- ❑ Newspaper
- ❑ Television
- ❑ Radio
- ❑ Internet
- ❑ Mail
- ❑ Public Workshops/meeting
- ❑ Other (please explain):

11. In your opinion, what are some steps your county or city governments could take to reduce or eliminate risk of future hazard damages in your neighborhood?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

12. Are there any other issues regarding the reduction of risk and loss associated with hazards or disasters in the community that you think are important?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

13. A number of community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories. Please tell us how important you think each one is for your community to consider pursuing.

1. Prevention
Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain regulations.

- ❑ **Very Important**
- ❑ **Somewhat Important**
- ❑ **Not Important**

2. Property Protection
Actions involve the modification of existing buildings to protect them from a hazard or removal from the hazard area. Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.

- ❑ **Very Important**
- ❑ **Somewhat Important**
- ❑ **Not Important**

3. Natural Resource Protection
Actions that, in addition to minimizing hazard losses also preserve or restore the functions of natural systems. Examples include: floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management.

- ❑ **Very Important**
- ❑ **Somewhat Important**
- ❑ **Not Important**

4. Structural Projects
Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include dams, levees, canals, detention/retention basins, channel modification, retaining walls and storm sewers.

- ❑ **Very Important**
- ❑ **Somewhat Important**
- ❑ **Not Important**

5. Emergency Services
Actions that protect people and property during and immediately after a hazard event; examples include warning systems, evacuation planning, emergency response training, and protection of critical emergency facilities or systems.

- ❑ **Very Important**
- ❑ **Somewhat Important**
- ❑ **Not Important**

6. Public Education and Awareness
Actions to inform citizens about hazards and the techniques they can use to protect themselves and their property. Examples include outreach projects, school education programs, library materials and demonstration events.

- ❑ **Very Important**
- ❑ **Somewhat Important**
- ❑ **Not Important**

THANK YOU FOR YOUR PARTICIPATION

Twin Falls County
AHMP Public Questionnaire Results

Written Comments and Responses

Question 5:
Is there a hazard not listed in this survey that you think is a wide-scale threat to your neighborhood?

1. CAFO
2. Water Quality (well). Air Quality – Dairy
3. Loss of drinking water due to poor conservation and uncontrolled development and potential coal produced energy.
   Loss of wildlife diversity due to human encroachment
   Potential exploitation of resources for coal fired energy production, nuclear waste storage and downwind consequences, too many CAFO's.
4. Social decline/crank
5. Niles fever
6. Promotion of wickedness by the media and lack of Godliness – morality of many in positions of authority or leadership
7. Septic tanks
8. Sugar factory
9. Unsafe water
10. Reckless use of firearms – there are bullet holes and a 22 slug in my roof
11. Clean water to drink??? We have a high level of arsenic in our drinking water
12. Aerosols from nearby CAFOs
13. Water contamination – Arsenic
14. Reeds Bean Co. has metal siding that is hazardous when the wind comes up
15. Poverty and infectious diseases
16. Economic- Over spent on mortgages etc. Down turn in agriculture
17. Water quality
18. Bird Flu pandemic
19. Arsenic in wells. Private wells and septics increasing on surrounding farm lands converted to home sales

Question 8:
Have you taken any actions to make your home or neighborhood more resistant to hazards?

1. Protested CAFO
2. Alarm system, smoke detectors
3. Water purifier on potable water for us and animals
4. I took advantage of free organic mosquito larvae pesticide offered by county extension office to treat irrigation and ornamental ponds in my neighborhood- but will need to treat every month when winter is over to control mosquitoes and spread of West Nile virus
5. Mosquito vigilance
6. Cement house and shop

7. Smoke alarm, fire
8. We have emergency preparedness equipment and have a one year food supply
9. Control of surrounding vegetation
10. Extreme care to prevent fire in old neighborhood with houses of indifferent repair too close together. Removed tall antenna from house. Tree trimmed
11. As much as can for my disability limits me in lots of things I can do
12. We bought a water filter that takes out arsenic and we are recommending it to others
13. Neighborhood flood watch and meeting yearly. The fire dept. hands out flyers on how to be better prepared for a number of disasters
14. Storm windows, extra insulation, add reserve fuel, propane, wood, upgraded furnace, purchased generator should we have power failure
15. Stand by generator, emergency food and fuel storage, back up location
16. Emergency food and equipment storage, emergency generator
17. Fenced yard
18. Emergency 72 hour kits, evacuation plans, food and water storage
19. I keep weeds under control for fire hazard (Before homes were built on lots)
20. Quality construction of home. Clear brush and trees (I live in country)
21. Wired for a generator. Storage of fuel

Question 11:
In your opinion, what are some steps your community or city governments could take to reduce or eliminate risk of future hazard damages in your neighborhood?

1. Limit number and size of CAFO.
   Permanent moratorium on coal plants
   No nuclear power plants
2. Listen to the citizen advisory group.
3. Communicate with the public what hazards do exist in our area. Hold public forums and ask for input how citizens can help if identified hazards do occur. Educate!
4. Define minimum air quality requirements and ways to assess air quality degradation. Increase preparedness for disease or medical disaster affecting a great number of people.
5. Mosquito abatement.
   Say “no” to coal fired energy plants
   Say “no” to nuclear waste storage
   Tighten CAFO and dairy standards regarding water, space, air quality, manure handling
   Invest in renewable energy like wind and solar
   Make all government buildings and street lighting CF bulbs and motion activated
   Mandate all government vehicles to never be left idling
   Stop all new permits for drive-up windows –idling cars waste fossil fuel and pollute
   Regulate water usage to conserve water
   Public education about reduce, reuse and recycle

Garbage fees, reward recycling and mandate recycling in all government offices.

6. Become more involved and supportive.
7. Should be in affect for mosquito control in our area. It is really bad here due to all the private farm reservoirs that are popping up all over this area. Why there were even allowed was stupid.
8. Have a plan
9. Through local government.
10. Water supply
11. I have no opinion
12. Contact the LDS Church and see how their system is set up. You'd be hard pressed to find anything better – as far as people in place to help spread the word or locations to take care of people, etc. in the case of an emergency.
13. Reduce arsenic in town well water
14. Stay out of it
15. Educate gun users- good luck with some of them! A bullet whizzed by my head last summer. Roofers dug a bullet out of my roof and found several bullet holes.
16. Be ahead of the curve
17. Demolish old houses or require upkeep. Insist that people don't turn their yards into garbage dumps. Trim trees on residential streets. Repair sidewalks. Encourage neighborhood pride. Insist that landowners maintain or demolish old rentals.
18. They could fix their fee for they got so expensive for our county and the people to help and work with they make the people responsible for thing they should have put back money when they got it from our state and government –
19. Enforce existing laws
20. There is none
21. I think they already do. They have town meetings at the fire dept and pass out flyers.
22. Education – having a plan
23. You can't stop Mother Nature, only prepare plans, shelters, and emergency evacuation routes and establish good warning measures like radio, TV should an emergency strike. Education is by far the best way – workshop, community mtgs. etc.
24. Emergency plans and training for each agency on how they would respond to emergencies with central control and dispatch.
25. Have the Reeds Bean or Grain Co. fix their siding on there company so it doesn't come lose and fly around when we have a wind storm.
26. Reasonable planning and zoning requirements. Emergency command centers and training for stuff. All law enforcement and fire persons trained as first responders.
27. Fix the sewers in town
28. Insect control – natural and otherwise.
29. Be prepared – education
30. Be well trained/informed to keep us informed
31. Not sure

32. Use good common sense derived from scientific research and information
33. I don't see how they could stop any event that I am concerned about. My concerns involve loss of electricity, which happens fairly frequently where I live in the country. That is why I choose to live in the country where I have more control over water, sewer and power (I own a generator).
34. Strict policing of hidden limits insurance companies hide from the policy holders. i.e., be up front about passengers being insured.
    Make for better insect control with more acreages of spraying (especially parks and water areas) for the West Nile mosquitoes
    Plan more controlled burns in high fire danger areas
35. Regulate agricultural pollutants i.e. CAFO!!
36. All the issues I checked are natural, I don't think the county or city governments can do anything to stop drought, earthquakes, extreme heat, air quality or high winds.
37. Regulate dairies closely
38. Not sure
39. Increase the acreage size for septic tanks. Monitor where dairies dispose of waste
40. Find out what risk we would have
    Step up standards on new construction
    Give a break in insurance to encourage people to make alteration on preexisting
41. Manage growth
    Education of water rights in local subdivisions
42. Educate things home owners need to do to protect their property and lives
43. More education on what actions to take if a disaster occurred. Where would the public shelters be? What to do if you are elderly or handicapped, etc.?
44. Well in our area the power lines are too low and when the winds are really high the lines will hit the semi trucks that pass through here. The Reed Seed and Co. are around the corner and I think that they could do something to help us by raising the power lines.

Question 12:
Are there any other issues regarding the reduction of risk and loss associated with hazards or disasters in the community that you think are important?

1. Never allow any development in a floodplain.
   Create an urban boundary and reward "in-fill' development (Portland, OR)
   Develop mass transit
   Build bicycle lanes everywhere
   Educate people about reduce, reuse, recycle, idling cars and using CF bulbs
   Always take the high road and advocate for the public health all policies that affect air quality and quality of life
2. We need mosquito abatement for the surrounding area of Twin Falls just outside city limits, especially here where we live. They are abundant.
3. School education
4. West Nile, Bird flu
5. I'm sure and everything is important we can't leave anything to chance

6. Biological chemical terrorism in our Country. Insect infestations, wind storms. I guess it is the unknown of things that could be that makes me know anything could take place and the way our men and women get killed so we can live in peace in our country.
7. Keep the public aware of hazards – probably most people don't know they exist
8. I think this is a waste of good city monies
9. Keep all plans and training current
10. Time matters on emergencies
11. How many homes in my immediate area carry homeowners insurance?
12. Control dairy and subdivisions growth - that affects water and environment
13. How can the city/county insure electrical power and phone service during an emergency?
14. Hold the INEEL (INL) accountable!
15. Have local law enforcement and county and state agencies connected for information. It will be important for every public agency and law enforcement agencies to cooperate and work together. I would hope we wouldn't see turf issues.