

IV. REQUIRED ELEMENTS OF THE WARNING PLAN

A complete flood warning plan consists of three basic elements:

- Detection and evaluation of the flood threat.
- Dissemination of the flood warnings to the public.
- Response of the public to the warnings.

All three parts must function properly or the warning plan will fail. The main purpose of the warning plan is to minimize the potential for loss-of-life. Public safety agencies will make decisions concerning floodplain evacuations and road closures. Individuals must also make appropriate decisions to protect themselves and their families. In some instances, a limited amount of emergency floodproofing by property owners can be accomplished. For residences and businesses along Ralston Creek, Leyden Creek, Van Bibber Creek and Moon Gulch, a flash flood warning would not likely provide enough lead-time to safely effect damage prevention measures such as sandbagging. Emergency property protection would probably be limited to turning off main gas and electricity connections.

The following pages provide a brief description of each of the three required elements listed above relative to this flood warning plan for the Ralston Creek drainage basin.

Detection and Evaluation of the Flood Threat

The Ralston Creek early flood threat detection and evaluation element consists of the following items:

ORGANIZATIONS, RESOURCES AND PROCEDURES

- The National Weather Service (NWS) Weather Forecast Office at Denver and their NEXRAD Doppler Radar stations located at Denver, Cheyenne and Pueblo.
- Henz Meteorological Services (HMS), a private meteorological firm retained by the Urban Drainage and Flood Control District (UDFCD) to coordinate with NWS; collect and analyze all pertinent weather and flood data; prepare daily heavy precipitation outlooks; provide affected jurisdictions with early notification of flood potentials; and update jurisdictions as conditions change.
- The Jefferson County Sheriff's Department Communications Center (JCC) which receives and disseminates all incoming weather and flood information. JCC is the primary communications link between HMS, NWS and other flood warning plan participants.
- Communication arrangements defined to insure adequate communications between all parties at all times. Primary communications are by telephone. Amateur radio operators may be contacted to provide backup communications.
- Standard messages used by HMS to provide information to JCC for relay to affected jurisdictions. HMS also communicates urgent "RED FLAG" messages directly to the Arvada Police to prompt priority dissemination and preparedness actions on their part.
- Emergency Operation Centers (EOCs) in Arvada and Jefferson County activated in a pre-emergency mode to gather and analyze information concerning the flood potential; maintain contacts with meteorologists, hydrologists and other support personnel; take early preparedness actions; mobilize field resources; and make warning decisions.
- Officials from Arvada, Jefferson County and volunteer fire districts who receive all critical weather and flood information and respond according to their respective internal procedures.

- Field personnel from various response agencies (Sheriff, police, fire districts, public works, road and bridge, and others) dispatched to monitoring locations to report rainfall amounts, stream and reservoir water levels, and general flood conditions to appropriate jurisdictions.
- Internal procedures and operating guidelines which are maintained, practiced and routinely updated by each participating local government agency, forecast service and support organization.

EQUIPMENT, DATA SOURCES AND DECISION GUIDANCE

- Satellite imagery display equipment located at NWS and HMS enabling meteorologists to see approaching weather systems and estimate local arrival times.
- Automated weather stations used to forecast flood potentials and predict storm development and movement.
- Data communications equipment, computers and software used to collect and analyze pertinent upper air and surface data.
- Radar product display equipment at NWS and HMS enabling meteorologists to evaluate current weather conditions; update heavy precipitation forecasts; estimate rainfall amounts at specific locations; predict storm movement, duration, and areal coverage; refine flood predictions; and anticipate specific flood problems.
- Automated rain and stream/reservoir water level gages which transmit real-time data from the Ralston Creek basin to base stations located at HMS, NWS and UDFCD.
- Decision aids which are used to quickly analyze the real-time data, refine forecasts and predict specific flood impacts.

Dissemination of Warnings, Watches and Advisories to the Public

Several ways exist to disseminate flood warnings, watches and advisories to the public. The delivery of public flood warnings is dependent, to a large extent, upon the electronic news media (i.e., radio and television) with the National Weather Service (NWS) being primarily responsible for the initial release of the warning and its content. Local governments are also responsible for disseminating public warning information within their political boundaries.

Three basic types of flood information are disseminated to the public: 1) **advisory** (meaning that nuisance flooding or flooding of a "less serious" nature is either possible or occurring); 2) **watch** (meaning that weather conditions are such that a hazardous flood may occur); and 3) **warning** (meaning that a flood which poses a significant threat to life or property is either occurring, is imminent, or has a very high probability of occurrence). The above types of information can be issued by the NWS, the local governments or both.

The NWS uses the following products to convey flood information to the public and to cooperating agencies:

- Special Weather Statement - This frequently issued statement may contain advisory information indicating a potential for heavy precipitation and possible flooding. It is also used to amplify watches, warnings, and advisories by reinforcing the message, indicating what is expected, and outlining appropriate response actions.
- Urban/Small Stream Flood Advisory - This advisory is typically used to indicate that minor nuisance flooding of small streams, streets, intersections and low-lying areas is imminent or occurring.
- Flood/Flash Flood Watch - This product means that flooding or flash flooding is possible within the geographic area described, but that the occurrence is neither certain nor imminent.
- Flood/Flash Flood Warning - This product means that hazardous flooding or flash flooding is imminent or occurring within the geographic area described.

All NWS products described above will be disseminated using NOAA Weather Radio and NOAA Weather Wire. Flash flood watches, warnings, and urban/small stream flood advisories will also be disseminated over NAWAS. The use of METS is limited to flash flood warnings and other warning products.

Local governments can initiate flood warnings and provide the public at risk with emergency information prior to an NWS issuance. HMS messages, current rain and stream level data from the ALERT system, and manual field observations can be used by officials for making warning decisions (refer to Sections III and VI). Local warnings can be disseminated over METS. The NWS will receive the information from METS and re-transmit the information as necessary and practicable. Also, the NWS can be contacted directly by local governments with additional dissemination requests.

The following presents a brief description of the several public dissemination methods mentioned in the above paragraphs along with some other available warning options:

- National Warning System (NAWAS) - NAWAS consists of full-period, private line voice circuits. The NWS Weather Forecast Office at Denver uses NAWAS to disseminate flood advisories, flash flood watches and warnings to "Warning Points" in Colorado. One 24-hour "Warning Point" in this system is the Jefferson County Sheriff's Department Communications Center (JCC).
- Metropolitan Emergency Telephone System (METS) - This is a telephone network to which government agencies and the media can subscribe. JCC, Arvada Police, Jefferson County Emergency Management and the NWS can quickly pass information to the media subscribers for broadcast on radio and TV. The NWS uses METS for warnings, but not for watches or advisories.
- NOAA Weather Wire - This is a satellite or Teletype-based communications system over which the NWS can pass information to local governments or media subscribers for broadcast.
- NOAA Weather Radio - This is a radio station operated by the NWS (Frequencies: 162.550, 162.475, and 162.450 MHz). Special weather radio receivers or scanners can be purchased by anyone who is interested.
- Emergency Alert System (EAS) - The EAS consists of radio, television, and cable outlets throughout the United States who are linked together to provide live broadcasts of presidential messages during times of national emergency. On a voluntary basis, the system may also be used for broadcasting state and local emergency warnings and information. Locally, radio station KOA (850 AM) is the primary entry point for the system. Jefferson County, Arvada and the National Weather Service have input capability into the system along with the Colorado State Patrol and the Colorado Office of Emergency Management.
- Emergency Vehicles - When a decision to evacuate the floodplain has been made, local law enforcement agencies and fire departments may dispatch vehicles to circulate through assigned portions of the floodplain using sirens and mobile public address systems to advise occupants to evacuate. Standard messages to be used on the public address systems are given in Section IX of this plan.

Once the decision to warn and/or evacuate has been made, it is necessary to quickly and efficiently disseminate the warning to floodplain occupants, motorists and others at risk. Dissemination should be made by as many different means as possible, but care should be taken to insure that warnings from different sources are similar in content. The warning message should clearly communicate the danger and recommend specific protective actions. Flood warnings for Ralston Creek and its tributaries can be issued by the broadcast media and loud speaker equipped vehicles. Confirmation of the initial warning is desirable whenever possible. People tend to seek confirmation before reacting to a warning.

All warning dissemination agencies, including the broadcast media, should have copies of the standard warning messages in Section IX. The media must be informed beforehand of the existing hazard and the details of the warning system; and they should be checked with periodically to insure their readiness.

Response of the Public to the Warning

If the desired response of the people in the flood hazard area to a warning is not obtained, the whole warning plan will have failed. Cultivation of the desired response must begin well in advance of any flood threat by heightening the public awareness of the flood hazard.

These steps will be taken annually to try to cultivate the desired response:

- The Urban Drainage and Flood Control District (UDFCD) will annually mail or deliver a brochure to all occupants of the Ralston Creek, Leyden Creek, Van Bibber Creek and Moon Gulch floodplains. The brochure will contain a map of the flood hazard area and provide information on steps to take prior to flooding (plan evacuation routes, buy flood insurance, etc.) and in the event of a flood warning.
- The local governments will put a notice of the flood hazard in appropriate publications each spring before the flood season.
- Media coverage of the flood hazard, including the annual practice of the warning plan, will be sought.