

# Emergency Action Plan (EAP)

**National Inventory of Dams (NID) No.**

\_\_\_\_\_, **Montana**

**Last EAP Update:**

Date: \_\_\_\_\_

Montana DNRC Dam Safety Program will create and insert Vicinity Map, Location Map, and Evacuation Map. Detailed (1:24,000) Evacuation Maps are the responsibility of the Dam Owner and must be submitted with the Final EAP.

Montana DNRC Dam Safety Program will create and insert Vicinity Map, Location Map, and Evacuation Map. Detailed (1:24,000) Evacuation Maps are the responsibility of the Dam Owner and must be submitted with the Final EAP.

**Vicinity Map**

**Location Map**

---

**Reviewed and Updated:**

*Name:* \_\_\_\_\_

*County Commissioner;* \_\_\_\_\_, *County*

*Date:* \_\_\_\_\_

*Name:* \_\_\_\_\_

*County Commissioner;* \_\_\_\_\_, *County*

*Date:* \_\_\_\_\_

**Copy** \_\_\_\_\_ **of** \_\_\_\_\_

## Concurrences

By my signature, I acknowledge that I, or my representative, have reviewed this plan and concur with the tasks and responsibilities assigned herein for me and my organization.

1. \_\_\_\_\_  
*Signature* *Organization* *Date*

Printed name and title:

2. \_\_\_\_\_  
*Signature* *Organization* *Date*

Printed name and title:

3. \_\_\_\_\_  
*Signature* *Organization* *Date*

Printed name and title:

4. \_\_\_\_\_  
*Signature* *Organization* *Date*

Printed name and title:

5. \_\_\_\_\_  
*Signature* *Organization* *Date*

Printed name and title:

6. \_\_\_\_\_  
*Signature* *Organization* *Date*

Printed name and title:

7. \_\_\_\_\_  
*Signature* *Organization* *Date*

Printed name and title:

# Table of Contents

**Emergency Notifications ..... 2**

**Level 2: Urgent Event, Dam Failure Appears Imminent..... 2**

**Level 1: Potentially Hazardous Situation Developing ..... 3**

    Emergency Services Contacts ..... 4

Basic EAP Data ..... 5

Potential Impacted Area..... 5

National Inventory of Dams (NID) Data:..... 6

Description of Dam:..... 6

The Five-step EAP Process ..... 7

*Step 1: Event Detection..... 7*

*Step 2: Emergency Level Determination ..... 8*

*Step 3: Notifications and Communication ..... 9*

*Step 4: Expected Actions ..... 11*

*Step 5: Termination ..... 12*

Appendices: ..... 13

    Appendix A-1: Location and Vicinity Maps..... 14

    Appendix A-2: Evacuation Map ..... 15

    Appendix A-3: Residents/Businesses/Highways at Risk ..... 16

    Appendix B-1: Resources Available..... 19

    Appendix C-1: Unusual or Emergency Event Log ..... 20

    Appendix C-2: Dam Emergency Situation Report..... 21

    Appendix D-1: Dam Safety: An Owners Guidance Manual ..... 22

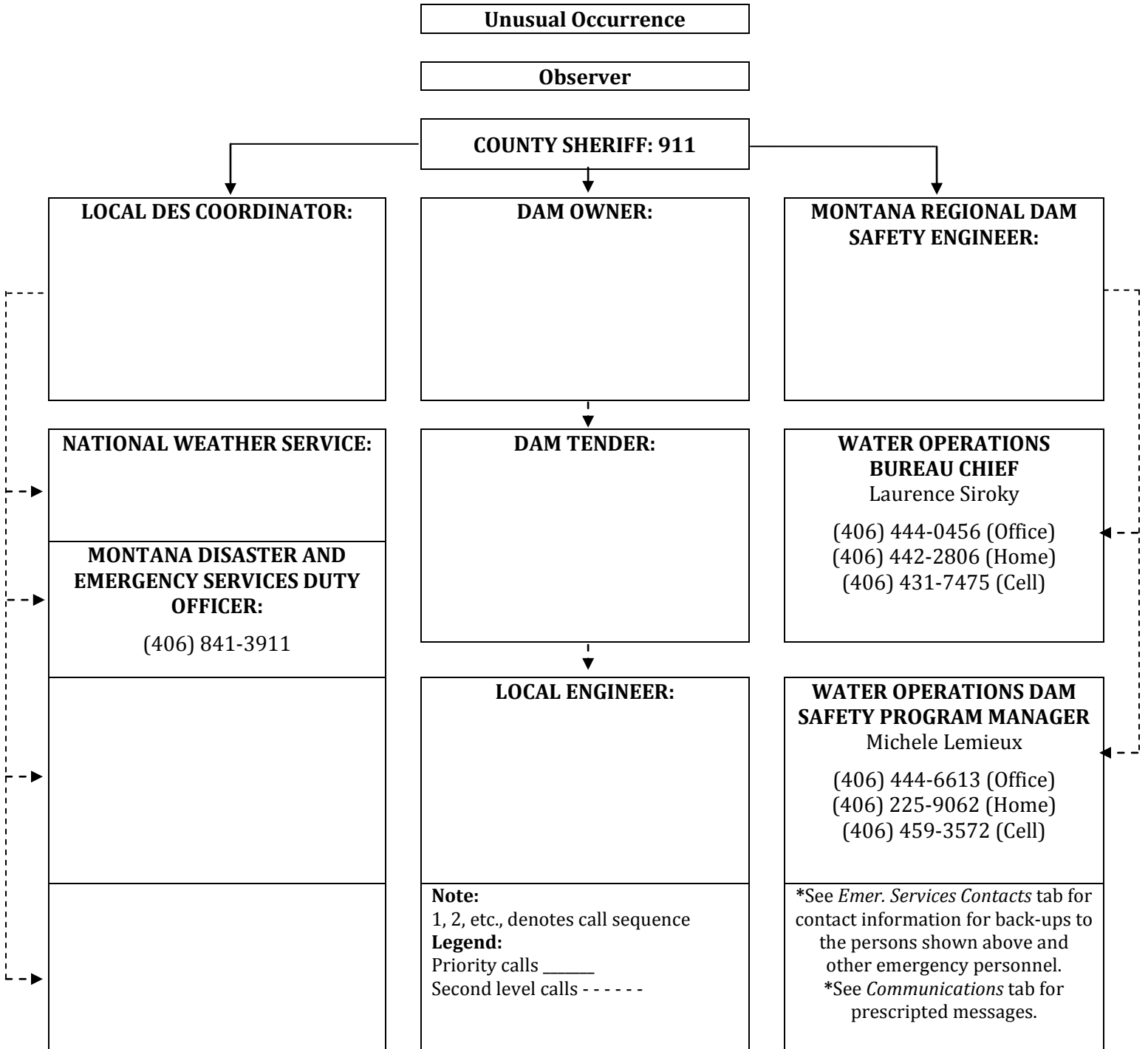
    Appendix E: Glossary of Terms ..... 23

    Appendix F: Maintenance—EAP Review and Revision ..... 26

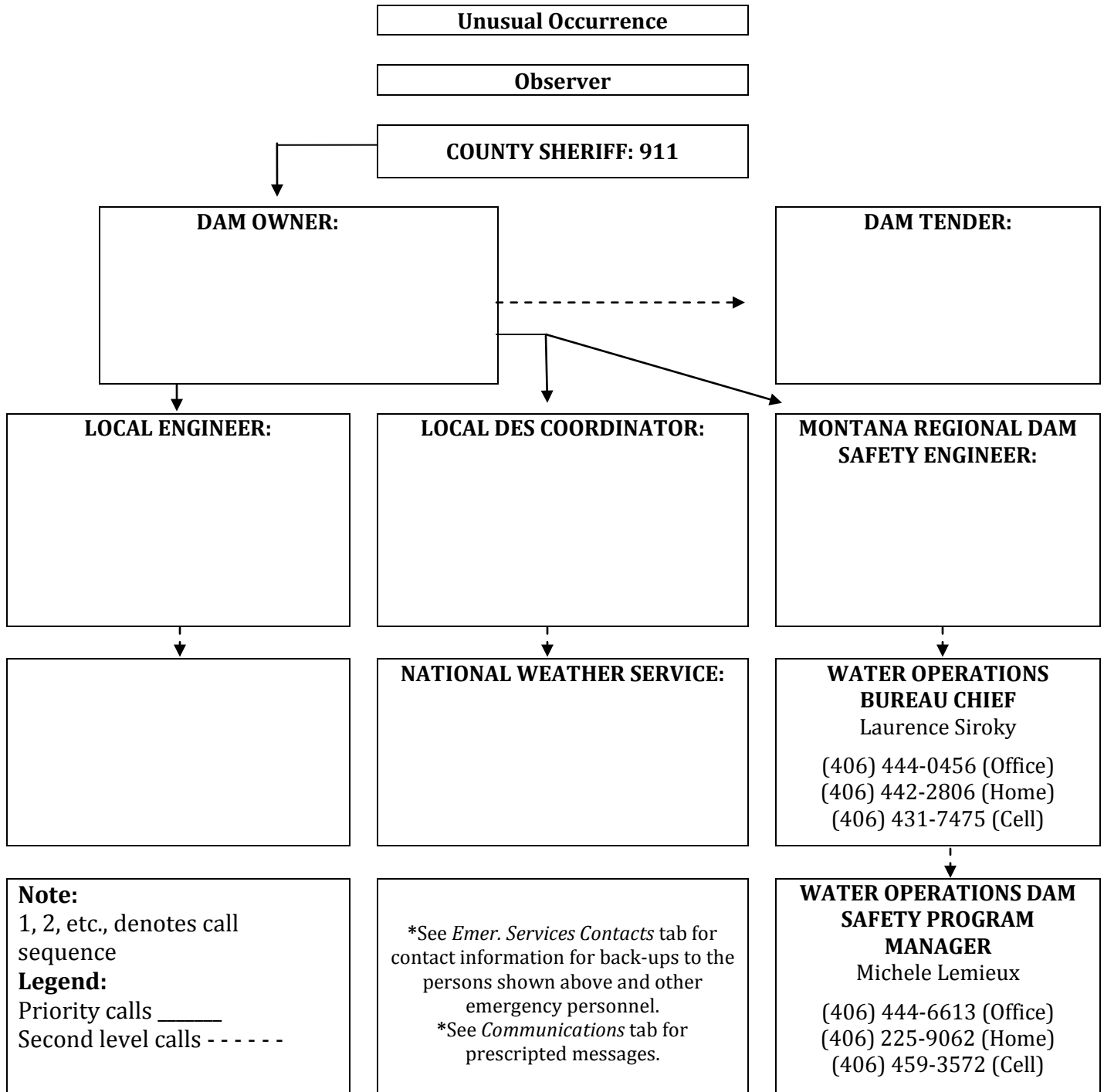
    Appendix-G: Control Copy Holders of this EAP ..... 27

## Emergency Notifications

### Level 2: Urgent Event, Dam Failure Appears Imminent or is in Progress for:



## Level 1: Potentially Hazardous Situation Developing Possible Dam Failure Notification Flowchart:





## Basic EAP Data

### Purpose

The purpose of this EAP is to reduce the risk of human life loss and injury and minimize property damage during an unusual or emergency event at

### Dam Description

Height:                      Drainage Area:

Legal Description: Sec.                      T                      R                      Dam Operator:

Latitude:                      Longitude:                      National Inventory of Dams No.

**Directions to dam** (See *Location and Vicinity Map*; Appendix A-1)

### Potential Impacted Area

See *Evacuation Map* tab (Appendix B-3) and *People at Risk* tab (Appendix B-4) for the locations and contact information of the following residents and businesses that may be flooded if the dam should fail and the estimated time for the flood wave to travel from the dam to these locations:

## National Inventory of Dams (NID) Data:

Dam name:	Max. discharge:
State: <b>Montana</b>	Max. storage:
Dam Height:	Dam Length:
NID ID:	Normal storage:
Longitude:	Surface area:
Latitude:	Principal spillway capacity:
County:	Principal spillway type:
Stream:	Auxiliary spillway type:
Nearest town:	Auxiliary spillway width:
Distance to nearest town:	Surface area:
Dam Operator:	Regulatory Agency:
Year constructed:	

### Description of Dam:

## **The Five-step EAP Process**

### ***Step 1: Event Detection***

This step describes the detection of an unusual or emergency event and provides information to assist the dam operator in determining the appropriate emergency level for the event.

Unusual or emergency events may be detected by:

- Observations at or near the dam by government personnel (local, state, or Federal), landowners, visitors to the dam, or the public
- Evaluation of instrumentation data
- Forewarning of conditions that may cause an unusual event or emergency event at the dam (for example: Earthquakes felt or reported in the vicinity of the dam or a severe weather or flash flood forecast)

### **NOTES:**

***Step 2: Emergency Level Determination***

After an unusual or emergency event is detected or reported, the Dam Owner or his alternate is responsible for classifying the event into one of the following three emergency levels:

**Emergency Level 1—Unusual event, Potential dam failure situation:**

This situation may eventually lead to dam failure and flash flooding downstream, but there is not an immediate threat of dam failure. The Sheriff should be notified of this emergency situation and placed on alert. The dam operator shall closely monitor the condition of the dam and periodically report the status of the situation to the Sheriff. If the dam condition worsens and failure becomes imminent, the Sheriff must be notified immediately of the change in the emergency level to evacuate the people at risk downstream.

Montana state dam safety officials should be contacted to evaluate the situation and recommend remedial actions to prevent failure of the dam. The dam operator should initiate remedial repairs (e.g. Local resources that may be available—see Appendix B-1). Time available to employ remedial actions may be hours or days.

**Emergency Level 2—Urgent; dam failure appears imminent or is in progress:**

This is an extremely urgent situation when a dam failure is occurring or obviously is about to occur and cannot be prevented. Flash flooding will occur downstream of the dam. This situation is also applicable when flow through the earth spillway is causing downstream flooding of people and roads. The Sheriff must be contacted immediately so emergency services can begin evacuations of all at-risk people and close roads as needed (see *Evacuation Map Appendix A-2*).

**NOTES:**

### ***Step 3: Notifications and Communication***

#### **Notification**

After the emergency level has been determined, the people on the following notification charts for the appropriate emergency level shall be notified immediately.

#### **Communication:**

##### **Emergency Level 1—Unusual event; potential dam failure situation – Non-urgent**

The following message may be used to help describe the emergency situation to the:

*“This is (**Identify yourself; name and position**) I have a ‘Non-emergency’ to report.*

*We have an unusual condition at the (**Name and Location of Dam**).*

*We have activated the Emergency Action Plan for this dam.*

*We are implementing predetermined actions to respond to an unusual event / rapidly developing situation that could result in dam failure.*

*Please be advised this situation may result in an evacuation the area along low-lying portions of (**Stream or Drainage Name**)*

*Reference the evacuation map in your copy of the Emergency Action Plan.*

*We will advise you when the situation is resolved or if the situation gets worse.*

*I can be contacted at the following number (**XXX-XXXX**). If you cannot reach me, please call the following alternative number (**XXX-XXXX**).”*

The Dam owner should then contact the Montana Department of Natural Resources and Conservation Dam Safety Program and/or a contract dam engineer. Describe the situation, and request technical assistance on next steps to take.

**Step 3: (Cont.)****Emergency Level 2—Urgent event; dam failure appears imminent or is in progress:**

The Sheriff should be contacted immediately and the area evacuated (see *Evacuation Map Appendix A-2*). The following actions should be taken:

1. Call the Sheriff's dispatch center. Be sure to say, "This is an emergency." They will call other authorities and the media and begin the evacuation. The following message may be used to help describe the emergency situation to the Sheriff or emergency management personnel:
 

*"This is an emergency. This is (**Identify yourself; name and position**)*  
***(Name and Location of Dam)** is failing. The downstream area must be evacuated immediately. Repeat, **(Name and Location of Dam)** is failing; evacuate the area along low-lying portions of **(Stream or Drainage Name)***  
*We have activated the Emergency Action Plan for this dam and are currently under Emergency Level 2. Reference the evacuation map in your copy of the Emergency Action Plan.*  
*I can be contacted at the following number **(XXX-XXXX)**. If you cannot reach me, please call the following alternative number **(XXX-XXXX)**."*
2. Do whatever is necessary to bring people in immediate danger (anyone on the dam, downstream from the dam, boating on the reservoir, or evacuees) to safety if directed by the Sheriff.
3. Keep in frequent contact with the Sheriff and emergency services to keep them up-to-date on the condition of the dam. They will tell you how you can help handle the emergency.
4. If all means of communication are lost: (1) try to find out why, (2) try to get to another radio or telephone that works, or (3) get someone else to try to re-establish communications. If these means fail, handle the immediate problems as well as you can, and periodically try to re-establish contact with the Sheriff and emergency services.

The following prescribed message may be used as a guide for the Sheriff or emergency services personnel to communicate the status of the emergency with the public:

*Attention: This is an emergency message from the Sheriff. Listen carefully. Your life may depend on immediate action.*

***(Name and Location of Dam)** is failing. Repeat. **(Name and Location of Dam)** is failing. If you are in or near this area, proceed immediately to high ground away from the valley. Do not travel on **(Highway/County Road)** or return to your home to recover your possessions. You cannot outrun or drive away from the flood wave. Proceed immediately to high ground away from the valley.*

### ***Step 4: Expected Actions***

If the police or Sheriff receives a 911 call regarding observations of an unusual or emergency event at the dam, the law enforcement agency should immediately contact the Dam Owner. Once an emergency level classification is determined, the following actions should be taken. If time permits, the Montana Department of Natural Resources and Conservation Dam Safety Program should be contacted for technical consultation.

#### **Emergency Level 1—Unusual event; Potential dam failure situation:**

- A. Contact the Sheriff / 9-1-1 and inform him/her of the unusual event and that the EAP has been activated and that an evacuation of downstream residents may be required. Preparations for road closures and evacuations should be made.
- B. Inspect the dam. At a minimum, the full length of the upstream slope, crest, downstream toe, and downstream slope shall be inspected. Also, check the reservoir area, abutments, and downstream channel for signs of changing conditions. **If increased seepage, erosion, cracking, or settlement are observed, immediately report the observed conditions to the Montana Regional Dam Safety Engineer or the Montana Department of Natural Resources and Conservation Dam Safety Program; refer to the emergency level table for guidance in determining the appropriate event level for the new condition and recommended actions.**
- C. Provide periodic updates to the Sheriff providing information on how the situation is unfolding.
- B. Record all contacts that were made. Record all information, observations, and actions taken on the *Event Log Form* (Appendix C-1). Note the time of changing conditions. Document the situation with photographs and video, if possible.
- C. The Dams Technical Representative should contact the Montana Regional Dam Safety Engineer or the Montana Department of Natural Resources and Conservation Dam Safety Program and request technical staff to investigate the situation and recommend corrective actions.

#### ***Emergency remedial actions***

**See Appendix D:**

**Dam Safety: An Owner's Guidance Manual**

**Chapter 5**

**Step 5: Termination**

Whenever the EAP has been activated, an emergency level has been declared, all EAP actions have been completed, and the emergency is over, the EAP operations must eventually be terminated and follow-up procedures completed.

**Termination responsibilities**

The Sheriff is responsible for terminating EAP operations and relaying this decision to the Montana Regional Dam Safety Engineer. It is then the responsibility of each person to notify the same group of contacts that were notified during the original event notification process to inform those people that the event has been terminated.

Prior to termination of an Emergency event that has not caused actual dam failure, the Montana Regional Dam Safety Engineer will inspect the dam or require the inspection of the dam to determine whether any damage has occurred that could potentially result in loss of life, injury, or property damage. If it is determined conditions do not pose a threat to people or property, the Sheriff will be advised to terminate EAP operations as described above.

The Regional Dam Safety Engineer shall ensure the *Dam Safety Emergency Situation Report* (Appendix A-3) is completed to document the emergency event and all actions that were taken. This will be distributed to State of Montana Dam Safety Officials.

**NOTES:**

## **Appendices: Maps, Forms, Glossary, and Supporting Data**

### **Appendix A**

- A-1 Location and Vicinity Maps
- A-2 Evacuation Map
- A-3 Residents/Businesses/Highways at Risk

### **Appendix B**

- B-1 Resources Available

### **Appendix C**

- C-1 Unusual or Emergency Event Log Form
- C-2 Dam Emergency Situation Report Form

### **Appendix D**

- D-1 Dam Safety: An Owners Guidance Manual (Chapter 5)

### **Appendix E**

- E-1 Glossary of Terms

### **NOTES:**

## **Appendix A-1: Location and Vicinity Maps**

Montana DNRC Dam Safety Program will create and insert Vicinity Map, Location Map, and Evacuation Map. Detailed (1:24,000) Evacuation Maps are the responsibility of the Dam Owner and must be submitted with the Final EAP.

## **Appendix A-2: Evacuation Map**

Montana DNRC Dam Safety Program will create and insert Vicinity Map, Location Map, and Evacuation Map. Detailed (1:24,000) Evacuation Maps are the responsibility of the Dam Owner and must be submitted with the Final EAP.







## Appendix B-1: Resources Available

Locally available equipment, labor, and materials:


## Appendix C-1: Unusual or Emergency Event Log

(to be completed during the emergency)

Dam name:

County:

When and how was the event detected?

Weather conditions:

General description of the emergency situation:

Emergency level determination:

Made by:

### Actions and Event Progression

Date	Time	Action/event progression	Taken by

Report prepared by: \_\_\_\_\_ Date: \_\_\_\_\_

## **Appendix C-2: Dam Emergency Situation Report** (to be completed following the termination of the emergency)

Dam name:

National Inventory of Dams (NID) No.

Dam location:

*(City)*                      *(County)*                      *(Stream/River)*

Date: Time:

Weather conditions:

General description of emergency situation:

Area(s) of dam affected:

Extent of dam damage:

Possible cause(s):

Effect on dam's operation:

Initial reservoir elevation:                      Time:

Maximum reservoir elevation:                      Time:

Final reservoir elevation:                      Time:

Description of area flooded downstream/damages/injuries/loss of life:

Other data and comments:

Observer's name and telephone number:

Report prepared by:    Date:

# **Appendix D-1: Dam Safety: An Owners Guidance Manual**

## **Chapter 5**

This Manual is available from the Montana DNRC Dam Safety Program:  
(406) 444-0862

## Appendix E: Glossary of Terms

<b>Abutment</b>	That part of the valley side against which the dam is constructed. The left and right abutments of dams are defined with the observer looking downstream from the dam.
<b>Acre-foot</b>	A unit of volumetric measure that would cover 1 acre to a depth of 1 foot. One acre-foot is equal to 43,560 cubic feet or 325,850 gallons.
<b>Berm</b>	A nearly horizontal step (bench) in the upstream or downstream sloping face of the dam.
<b>Boil</b>	A disruption of the soil surface due to water discharging from below the surface. Eroded soil may be deposited in the form of a ring (miniature volcano) around the disruption.
<b>Breach</b>	An opening through the dam that allows draining of the reservoir. A controlled breach is an intentionally constructed opening. An uncontrolled breach is an unintended failure of the dam.
<b>Conduit</b>	A closed channel (round pipe or rectangular box) that conveys water through, around, or under the dam.
<b>Control section</b>	A slice through the dam showing elevation vertically and direction of natural water flow horizontally from left to right. Also, a slice through a spillway showing elevation vertically and left and right sides of the spillway looking downstream.
<b>Dam</b>	An artificial barrier generally constructed across a watercourse for the purpose of impounding or diverting water.
<b>Dam failure</b>	The uncontrolled release of a dam's impounded water.
<b>Dam Operator</b>	The person(s) or unit(s) of government with responsibility for the operation and maintenance of dam.
<b>Drain, toe or foundation, or blanket</b>	A water collection system of sand and gravel and typically pipes along the downstream portion of the dam to collect seepage and convey it to a safe outlet.
<b>Drainage area (watershed)</b>	The geographic area on which rainfall flows into the dam.
<b>Drawdown</b>	The lowering or releasing of the water level in a reservoir over time or the volume lowered or released over a particular period of time.
<b>Emergency</b>	A condition that develops unexpectedly, endangers the structural integrity of the dam and/or downstream human life and property, and requires immediate action.
<b>Emergency Action Plan (EAP)</b>	A formal document identifying potential emergency conditions that may occur at the dam and specifying preplanned actions to minimize potential failure of the dam or minimize failure consequences including loss of life, property damage, and environmental impacts.
<b>Evacuation map</b>	A map showing the geographic area downstream of a dam that should be evacuated if it is threatened to be flooded by a breach of the dam or other large discharge.

<b>Filter</b>	The layers of sand and gravel in a drain that allow seepage through an embankment to discharge into the drain without eroding the embankment soil.
<b>Free board</b>	Vertical distance between a stated water level in the reservoir and the top of dam.
<b>Gate, slide or sluice, for regulating</b>	An operable, watertight valve to manage the discharge of water from the
<b>Groin</b>	The area along the intersection of the face of a dam and the abutment.
<b>Hazard classification</b>	A system that categorizes dams (high, significant, or low) according to the degree of their potential to create adverse incremental consequences such as loss of life, property damage, or environmental impacts of a failure or mis-operation of a dam.
<b>Height, dam</b>	The vertical distance between the lowest point along the top of the dam and the lowest point at the downstream toe, which usually occurs in the bed of the outlet channel.
<b>Hydrograph; Inflow, Out flow or breach</b>	A graphical representation of either the flow rate or flow depth at a specific point above or below the dam over time for a specific flood occurrence.
<b>Incident Commander</b>	The highest predetermined official available at the scene of an emergency situation.
<b>Instrumentation</b>	An arrangement of devices installed into or near dams that provide measurements to evaluate the structural behavior and other performance parameters of the dam and appurtenant structures.
<b>Inundation area or map</b>	The geographic area downstream of the dam that would be flooded by a breach of the dam or other large discharge.
<b>Notification</b>	To immediately inform appropriate individuals, organizations, or agencies about a potentially emergency situation so they can initiate appropriate actions.
<b>Outlet works (principal spillway)</b>	An appurtenant structure that provides for controlled passage of normal water flows through the dam.
<b>Piping</b>	The progressive destruction of an embankment or embankment foundation by internal erosion of the soil by seepage flows.
<b>Probable Maximum Precipitation (PMP) Or Flood (PMF)</b>	The theoretically greatest precipitation or resulting flood that is meteorologically feasible for a given duration over a specific drainage area at a particular geographical location.
<b>Reservoir</b>	The body of water impounded or potentially impounded by the dam.
<b>Riprap</b>	A layer of large rock, pre-cast blocks, bags of cement, or other suitable material, generally placed on an embankment or along a watercourse as protection against wave action, erosion, or scour.
<b>Risk</b>	A measure of the likelihood and severity of an adverse consequence.
<b>Seepage</b>	The natural movement of water through the embankment, foundation, or abutments of the dam.
<b>Slide</b>	The movement of a mass of earth down a slope on the embankment or abutment of the dam.

<b>Spillway (auxiliary or emergency)</b>	The appurtenant structure that provides the controlled conveyance of excess water through, over, or around the dam.
<b>Spillway capacity</b>	The maximum discharge the spillway can safely convey with the reservoir at the maximum design elevation.
<b>Spillway crest</b>	The lowest level at which reservoir water can flow into the spillway.
<b>Tail water</b>	The body of water immediately downstream of the embankment at a specific point in time.
<b>Toe of dam</b>	The junction of the upstream or downstream face of an embankment with the ground surface.
<b>Top of dam (crest of dam)</b>	The elevation of the uppermost surface of an embankment which can safely impound water behind the dam.

## **Appendix F: Maintenance—EAP Review and Revision**

### **EAP annual review**

The State of Montana Emergency Action Plan Coordinator will review and, if needed, update the EAP at least once each year. The EAP annual review will include the following:

- Calling all contacts on the three notification charts in the EAP to verify that the phone numbers and persons in the specified positions are current. The EAP will be revised if any of the contacts have changed.
- Contacting the local law enforcement agency to verify the phone numbers and persons in the specified positions. In addition, the State of Montana Emergency Action Plan Coordinator will ask if the person contacted knows where the EAP is kept and if responsibilities described in the EAP are understood.
- Calling the locally available resources to verify that the phone numbers, addresses, and services are current.

### **Revisions**

The Dam Owner is responsible for updating the EAP document. The EAP document held by the Dam Owner is the master document. When revisions occur, the Dam Owner will provide the revised pages and a revised revision summary page to all the EAP document holders. The document holders are responsible for revising outdated copy of the respective document(s) whenever revisions are received. Outdated pages shall be immediately discarded to avoid any confusion with the revisions.

### **EAP periodic test**

The Dam Owner, with the assistance of the Montana Disaster and Emergency Services county representative, and the Montana Department of Natural Resources and Conservation Dam Safety Program, will host and facilitate a periodic test of the EAP at least once every 5 years.

The periodic test will consist of a meeting, including a tabletop exercise, Attendance should include the Dam Owner, Local Disaster and Emergency Services Representative and others with key responsibilities listed in the EAP. At the discretion of the Local Disaster and Emergency Services Representative and Dam Safety Personnel, other organizations that may be involved with an unusual or emergency event at the dam are encouraged to participate. Before the tabletop exercise begins, meeting participants should visit the dam during the periodic test to familiarize themselves with the dam site.

The tabletop exercise will begin with the facilitator presenting a scenario of an unusual or emergency event at the dam. The scenario will be developed prior to the exercise. Once the scenario has been presented, the participants will discuss the responses and actions that they would take to address and resolve the scenario. The narrator will control the discussion, ensuring realistic responses and developing the scenario throughout the exercise. The Conservation District Manager should complete an event log as they would during an actual event.

### Appendix-G: Control Copy Holders of this EAP

Copy Number	Organization	Person receiving copy
1		
2		
3		
4		
5		
6		

<b>Copy Number</b>	<b>Organization</b>	<b>Person receiving copy</b>
7		
8		
9		
10		
11		
12		