

(TEMPLATE LAKE DAM)

IEAP

INCIDENT AND EMERGENCY ACTION PLAN

NATIONAL INVENTORY OF DAMS NO. IN (XXXXXX)

IDNR DAM NO. (X-XX)

(DAM LOCATION)

(OWNER OF DAM)

Copy No. _____
Revision No. 0
(Month&Year)

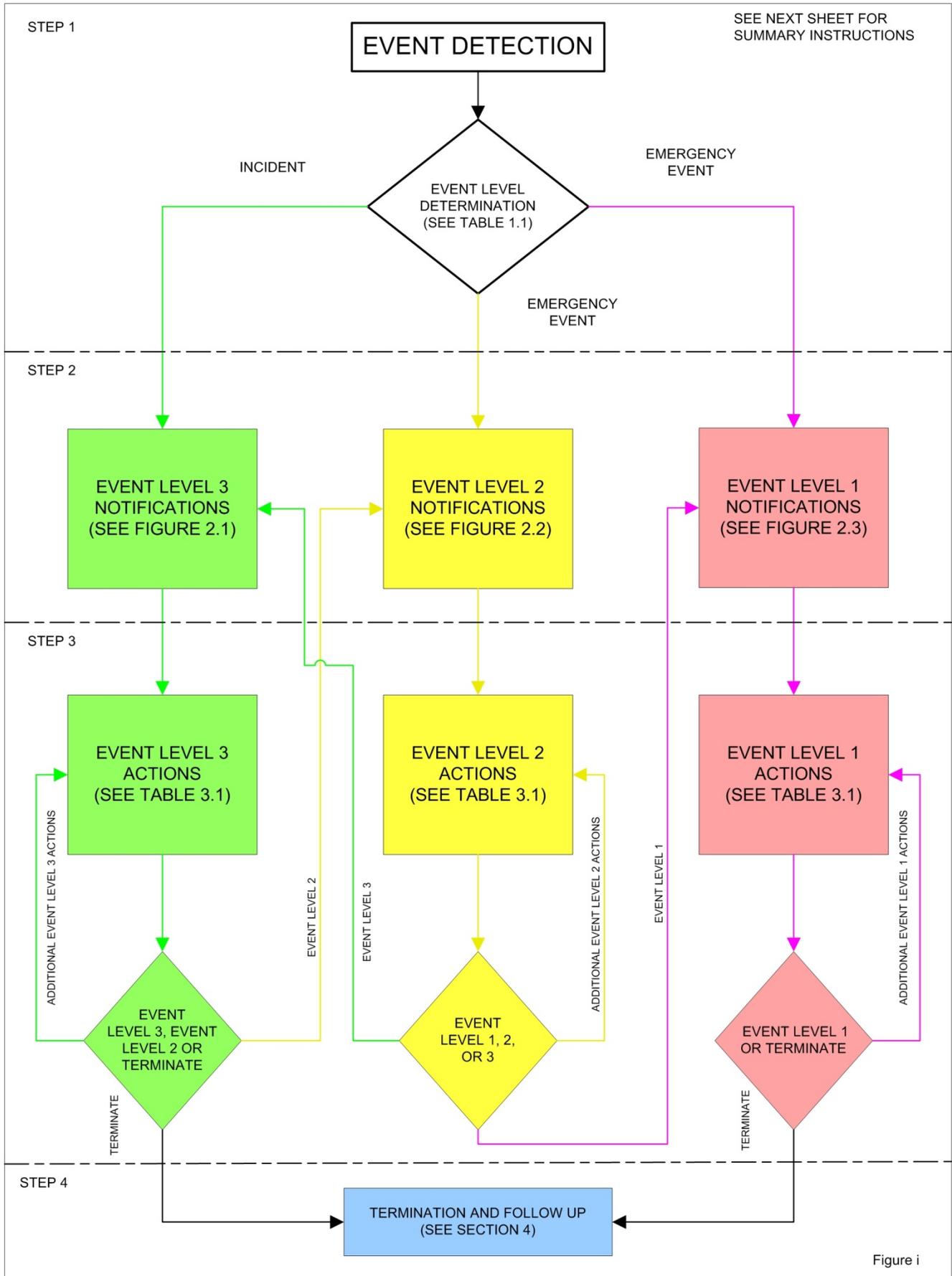


Figure i

SUMMARY OF IEAP PROCESS

There are four steps that must be followed anytime an incident or emergency event is detected at (Template Lake Dam). The steps are:

- Step 1: Event Detection and Level Determination
- Step 2: Notification and Communication
- Step 3: Expected Actions
- Step 4: Termination and Follow-up

Incidents and emergency events are defined in Section 1.2.1 of this Incident and Emergency Action Plan (IEAP). Specific actions required for each step will depend on the severity of the situation as defined during Step 1. The actions required for each step of the IEAP are summarized graphically on the IEAP Flow Chart (Figure i) and are described in the corresponding IEAP Section. A summary of each step is provided below.

Step 1 - Event Detection and Level Determination

During the initial step, an incident or emergency event is detected at the dam and classified by the (IEAP Coordinator or designee) into one of the following event levels:

- Event Level 3: Incident, slowly developing
- Event Level 2: Emergency Event, rapidly developing
- Event Level 1: Emergency Event, imminent dam failure or flash flooding

Information to help the (IEAP Coordinator or designee) determine which of the above event levels is applicable is provided in Section 1 of this IEAP.

Step 2 - Notification and Communication

After the event level has been determined, notifications are made in accordance with the appropriate notification flow chart provided in Section 2 of this IEAP.

Step 3 - Expected Actions

After the initial notifications are made, the (IEAP Coordinator or designee) should refer to Table 3.1 and confer with the (Engineering Director or designee) to develop and execute appropriate preventative actions. During this step of the IEAP, there is a continuous process of taking actions, assessing the status of the situation, and keeping others informed through communication channels established during the initial notifications. The IEAP may go through multiple event levels during Steps 2 and 3 as the situation either improves or worsens.

Step 4 - Termination and Follow-up

Once the event has ended or been resolved, termination and follow-up procedures should be followed as outlined in Section 4 of this IEAP. IEAP operations can only be terminated after completing operations under Event Level 3 or 1. If Event Level 2 is declared, the operations must be designated Event Level 3 or 1 before terminating the IEAP operations.

APPROVAL AND ACCEPTANCE

The undersigned states that he/she has read the following document and understands the contents of it, and that all the statements contained in the document are true and correct, to the best of his/her knowledge and belief.

IEAP Coordinator's Approval and Acceptance:

(Signature)

(Printed Name)

(Title)

(Date)

Owner/Engineering Department Director's Approval and Acceptance:

(Signature)

(Printed Name)

(Title)

(Date)

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PRIVACY STATEMENT

(Insert statement regarding the collection, distribution and use of the pertinent information included in this report. Describe the need for an emergency roster, who has collected it, and that it is subject to the provision of the applicable Federal and State privacy acts and regulations.)

ACKNOWLEDGEMENTS

This document was prepared by (preparer of document) for (dam owner). (Recognize any pertinent assistance or input received in the development of this document.)

PURPOSE

The purpose of this IEAP is to reduce the risk of human life loss and injury during an incident or emergency event at (Template Lake Dam). (Identify the locations downstream of the dam that can potentially present risk to human lives in the case of an emergency event.)

A secondary purpose of the IEAP is to minimize the potential for property damage during an incident or emergency event at (Template Lake Dam). (Identify any notable infrastructure (e.g. neighborhoods, bridges, shopping centers etc.) that may be damaged by an incident or emergency event.)

IEAP ANNUAL REVIEW AND PERIODIC TEST

This IEAP document will require an annual review and update to stay current. A periodic test of the IEAP procedures is also required every (test interval, typically 5 years) to ensure continued effectiveness. For annual review and periodic test procedures, reference Appendix D.

REVISIONS

For revision procedures, reference Appendix D.

Revision No.	Date	Revisions Made
0	<u>Month&Year</u>	IEAP published in IDNR 2012 format.

Revised pages inserted in this IEAP by

(Signature)

(Printed Name)

(Date)

SECTION 1. EVENT DETECTION AND LEVEL DETERMINATION

This section of the Incident and Emergency Action Plan (IEAP) describes the first step that must be followed whenever an incident or emergency event is detected at (Template Lake Dam). This section also describes event detection and information to assist the (IEAP Coordinator or designee) in determining the appropriate level for the event.

1.1 Event Detection

Incidents or emergency events may be detected by:

- (List the various means by which an incident or emergency event may be detected. Include likely point of notification and, if applicable, specifics regarding instrumentation, earthquakes and/or severe weather alerts from USGS, etc..)

After any incident or emergency event is detected and reported to the (IEAP Coordinator), the (IEAP Coordinator) (or Acting (IEAP Coordinator)) is responsible for determining the level of the event. If the (Local Emergency Services Agency) receives a 911 call regarding observations of an incident or emergency event at the dam, the dispatcher shall first contact the (IEAP Coordinator). The (IEAP Coordinator or designee) shall determine the appropriate event level (as defined in Section 1.2.2) and advise the dispatcher of the event level.

1.2 Event Level Determination

1.2.1 Incidents and Emergency Events

An incident is defined as an event, which takes place, or a condition, which is slowly developing, that is not normally encountered in the routine operation of the dam and reservoir, or necessitates a variation from Standard Operating Procedures. Such events are more common than emergency conditions and often offer time to conduct preplanned responses to the slowly developing situation. If addressed in a timely manner, such events can often be prevented from progressing into a much worse event. An incident requires operations in accordance with Event Level 3 of this IEAP.

An emergency event is defined as an event, which takes place, or a condition, which develops, that is of a serious nature that may endanger the dam, or endanger persons or property, and demands immediate attention. An emergency event requires immediate operations in accordance with Event Level 2 or 1 of this IEAP.

1.2.2 Level Determination

The (IEAP Coordinator) shall be responsible for defining incidents or emergency events as one of the three following event levels:

Event Level 3 - This is an incident that is defined as an unusual, slowly developing situation that may endanger the structural integrity of the dam. (Identify the position responsible for monitoring the progression of the event. Typically, this is the IEAP Coordinator. Note any special cases that would cause or require deviation from the standard notification protocol.)

Event Level 2 - This is an emergency event that is defined as rapidly developing and could quickly lead to dam failure and flash flooding downstream of the dam. (Identify the organization(s) that will prepare the area downstream of Template Lake Dam for evacuation. Typically, this is the local emergency management agency or fire department. Establish a contingency plan should the IEAP Coordinator be unable to determine event level.)

Event Level 1 - This is an emergency event that is defined as imminent dam failure or flash flooding downstream of the dam. (Identify the organization(s) responsible for the immediate evacuation of potentially inundated areas downstream of Template Lake Dam. Typically, this is the local emergency management agency or fire department.)

1.2.3 Level Determination Guidance

Table 1.1 shall be used as a guide for determining the appropriate event level. This table attempts to be all inclusive; however, an event or condition may arise that is not covered in this table. In the circumstance of multiple events occurring at the dam with conflicting event levels, always designate the higher event level as the governing event level.

1.2.4 Roles, Responsibilities, and Authority

IEAP Coordinator – The (IEAP Coordinator) shall function as the IEAP operations coordinator and/or Incident Manager during any of the three event levels of operation described in this IEAP. The (IEAP Coordinator) has the authority to take the necessary actions described in this IEAP. If time permits, the (IEAP Coordinator) should consult with the (Engineering Director) before initiating notifications described in this IEAP.

The (IEAP Coordinator) is responsible for providing initial, timely, and accurate notifications to the (Warning/Evacuation Director) and the (Public Relations Director) after an Event Level 2 or 1 has been determined. The (IEAP Coordinator) is also responsible for providing subsequent updates of the situation to the (Warning/Evacuation Director) to assist in making timely and accurate decisions regarding warning and evacuation responsibilities.

Once an Event Level 2 or 1 is terminated, the (IEAP Coordinator) is responsible to submit to the (Engineering Director), as soon as possible, an accurate summary document of the field observation and activities of the event.

(Warning/Evacuation Director – Describe the role of the Warning/Evacuation Director; typically, this is the local emergency management agency or fire department. In general, this will involve coordinating the preparation to evacuate downstream of the dam, as well as the implementation of the evacuation itself. Clarify notification procedures, and establish a redundancy protocol in the case that event detection notification is not through the IEAP Coordinator.

Engineering Director – Describe the role of the Engineering Director. Typically, this is the engineering department of the owner or an on-call engineer who is familiar with the dam and with whom the owner has established a contractual on-call agreement. In general, the responsibilities of this position will involve assistance in technical aspects of the dam, event level determination and evaluation, and anything that pertains to the condition of the dam, including any necessary follow-up activities, including issuing updates to the IEAP.

Public Relations Director – Describe the role of the Public Relations Director; typically, this is the owner or his/her public relations department. In general, this will involve preparing a public

statement and notifying the media about the event.)

[Note to preparer: Add a tab sheet before this page, with the tab label indicating "Table 1.1."]

**TABLE 1.1
EVENT LEVEL DETERMINATION GUIDANCE**

Event	Observation	Event Level
Flooding	<i>(Clearly describe the condition(s) necessary to classify an incident or unusual event as Event Level 3 in accordance with its definition in Section 1.2. Include a specific description of the requirements, as well as one that may be determined visually, without assistance from instrumentation. This description should be easily understood by someone unfamiliar with the concepts of dam engineering. For example, in the event of flooding, an exact reservoir water surface elevation threshold would be given, as well as visual cues that allow for quick detection of this water level.)</i>	3
	<i>(Clearly describe the condition(s) necessary to classify a rapidly developing emergency event as Event Level 2 in accordance with its definition in Section 1.2. Include a specific, measurable standard in addition to easily observable visual cues. Note that these conditions should be more severe than those that reflect a classification of Event Level 3, but should still be conservative enough to allow adequate time for warning/evacuation prior to dam failure)</i>	2
	<i>(Clearly describe the condition(s) necessary to classify an emergency event that may result in imminent dam failure or flash flooding as Event Level 1. Note that these conditions should be more severe than those that reflect a classification of Event Level 2, but should still be conservative enough to allow adequate time for warning/evacuation prior to potential dam failure)</i>	1
Earthquake	<i>(See Level 3 description above. Ex: magnitude of earthquake within a specified distance)</i>	3
	<i>(See level 2 description above. Ex.: earthquake that causes visible damage)</i>	2
	<i>(See Level 1 description above. Ex.: visible damage, water released)</i>	1
Seepage	<i>(See Level 3 description above. Ex.: discovery of new seepage areas)</i>	3
	<i>(See level 2 description above. Ex.: threshold of seepage flow rate, color of discharge)</i>	2
	<i>(See Level 1 description above. Ex.: threshold of seepage flow rate.)</i>	1
Cracking	<i>(See Level 3 description above. Ex.: new cracks of a specified width)</i>	3
	<i>(See level 2 description above. Ex.: new cracks of specified width, seepage)</i>	2
Movement	<i>(See Level 3 description above. Ex.: movement of structures by a specified distance)</i>	3
	<i>(See level 2 description above. Ex.: significant movement)</i>	2
Overtopping	<i>(See Level 1 description above. Ex.: reservoir water surface elevation level above dam crest)</i>	1
Gate Failure	<i>(See Level 3 description above. Ex.: inability to open/close gates)</i>	3
	<i>(See level 2 description above. Ex.: inability to open/close gates, rising water)</i>	2
	<i>(See Level 1 description above. Ex.: inability to open/close gates, overtopping)</i>	1
Blocked Gates	<i>(See Level 3 description above. Ex.: gates blocked by debris)</i>	3
Instruments	<i>(See Level 3 description above. Ex.: abnormal instrumentation reading)</i>	3
Sabotage	<i>(See Level 3 description above. Ex.: sabotage unlikely to cause dam failure)</i>	3
	<i>(See level 2 description above. Ex.: sabotage that may cause dam failure)</i>	2
	<i>(See Level 1 description above. Ex.: sabotage resulting in imminent dam failure)</i>	1

[While a separate description is necessary for each event level assigned to an event, note that not all three event levels will apply to each type of event. For example, a blocked outlet culvert may

warrant an Event Level 3 determination, but it would not have an entry for Event Level 1 since it is unlikely to cause failure of the dam unless other emergency events are present. Also, not all event types may be applicable to every dam. For example, if the dam does not have instrumentation or gates, those rows should be deleted.]

SECTION 2. NOTIFICATION AND COMMUNICATION

This section of the IEAP describes the appropriate notifications that should be made after the (IEAP Coordinator) has determined the event level as an Event Level 3, 2, or 1. This section also outlines the communication systems that are available for making notifications as well as a Public Affairs Plan with sample media release and a list of media contacts. Notifications should be made in accordance with the appropriate Notification Flow Chart provided in this Section (Figures 2.1, 2.2, and 2.3).

2.1 Communication Systems

(Outline the communication systems available to the IEAP Coordinator. Note, if applicable, the presence of portable radios, and include a rating of the cell phone coverage at the dam site.)

2.2 Prescribed Messages

The following prescribed messages may be used as a guide to communicate the status of an event. (Add information as necessary; however, keep in mind that clarity and brevity are the most important qualities of these messages.)

Event Level 3

- This is the (IEAP Coordinator). I am making this call in accordance with the (Template Lake Dam) IEAP.
- An incident has been detected at (Template Lake Dam).
- The IEAP has been activated, currently at an incident level (Level 3).
- If a problem occurs, flooding along (Template Creek) is possible.
- The situation is being monitored to determine if any evacuation warnings are necessary.
- We will keep you apprised of the situation. The best telephone number to reach me during this event is ... *(state the best number to reach you)*.

Event Level 2

- This is the (IEAP Coordinator). I am making this call in accordance with the (Template Lake Dam) IEAP.
- Problems have occurred with (Template Lake Dam).
- The IEAP has been activated, currently at the emergency level (Level 2).
- Flooding along (Template Creek) is possible.
- **Prepare to evacuate** along the (identify potential evacuees/evacuation limits along Template Creek).
- We will keep you apprised of the situation. The best telephone number to reach me during this event is ... *(state the best number to reach you)*.

Event Level 1

- This is the (IEAP Coordinator). I am making this call in accordance with the (Template Lake Dam) IEAP.
- Failure of (Template Lake Dam) is imminent.
- The IEAP has been activated, currently at the highest emergency level (Level 1).
- Flooding along (Template Creek) will occur.

- **Immediately evacuate** along the (identify potential evacuees/evacuation limits along Template Creek).
- We will keep you apprised of the situation. The best telephone number to reach me during this event is ... *(state the best number to reach you)*.

2.3 Public Affairs Plan

In the event of an incident or an emergency condition, the (Public Relations Director) will be alerted and briefed on the situation. The (Public Relations Director) will prepare and deliver a message for public release based on the existing conditions and information from the (Engineering Director or designee), or other sources.

Preparation of warning messages should begin as soon as their potential need is apparent so that they can be issued promptly upon determination of a Level 2 or Level 1 event. Where time is available for its preparation, the initial message should contain all pertinent information. However, in some cases, an emergency condition may be declared with little or no advance notice. The following example messages provide a model for the first announcements in such cases for Event Levels 2 and 1. Subsequent announcements should provide additional details.

Announcement for Possible Dam Failure Problem (Event Level 2)

THE (agency) ANNOUNCED AT (time) TODAY THAT AN EMERGENCY CONDITION EXISTED AROUND (Template Lake Dam) DUE TO (general description of problem). THE DAM IS LOCATED (generalized location of dam for public), INDIANA.

THE (agency) SPOKESPERSON SAID THAT THE WATER LEVEL OF THE (Template Lake) WAS BEING LOWERED (reason).

THE SPOKESPERSON EMPHASIZED THAT THE DRAWDOWN OF THE LAKE WAS BEING CARRIED OUT UNDER CONTROLLED CONDITIONS AND THERE IS NO IMMEDIATE DANGER OF THE DAM FAILING. HOWEVER, AS A PRECAUTIONARY MEASURE, (description of potential evacuees/evacuation areas downstream of dam) SHOULD PREPARE TO EVACUATE.

ADDITIONAL INFORMATION WILL BE RELEASED AS PROMPTLY AS POSSIBLE.

Announcement for Possible Dam Failure Imminent or in Progress (Event Level 1)

URGENT, URGENT: THE (agency) ANNOUNCED AT (time) TODAY THAT AN EMERGENCY CONDITION EXISTED AROUND (Template Lake Dam) DUE TO (general description of problem). THE DAM IS LOCATED (generalized location of dam for public), INDIANA.

ATTEMPTS TO SAVE THE DAM ARE UNDERWAY BUT THEIR SUCCESS CANNOT BE DETERMINED AS YET. (description of potential evacuees/evacuation areas downstream of dam) SHOULD EVACUATE TO HIGH GROUND **IMMEDIATELY!**

IF THE DAM FAILS, WATER WILL TAKE (describe time for flood wave to travel from dam breach to point of interest). AREAS CLOSER TO THE DAM WILL BE FLOODED SOONER.

ADDITIONAL INFORMATION WILL BE RELEASED AS PROMPTLY AS POSSIBLE.

Media Contacts

(Identify the primary source through which emergency announcements are released to the news media. It is suggested that the National Weather Service be used for this purpose. The telephone number appears below.)

NATIONAL WEATHER SERVICE (24-hour telephone number): (317) 856-0367

(List several radio and television stations that are likely to provide coverage to the area in danger, along with the 24-hour phone numbers of the news rooms of these stations. Specify that these sources should be contacted only if the primary source cannot be reached.)

[Note to preparer: Add a tab sheet before this page, with the tab label indicating "Figure 2.1." The notification flow chart is by no means limited to these sections. This is only meant to give a basic guideline of what types of organizations should be contacted in the case of an incident. Additional contacts can and should be added by the owner/operator as necessary to have an efficient IEAP command structure developed for rapid notification, communication and action. Contents should be relegated to vital emergency participants.]

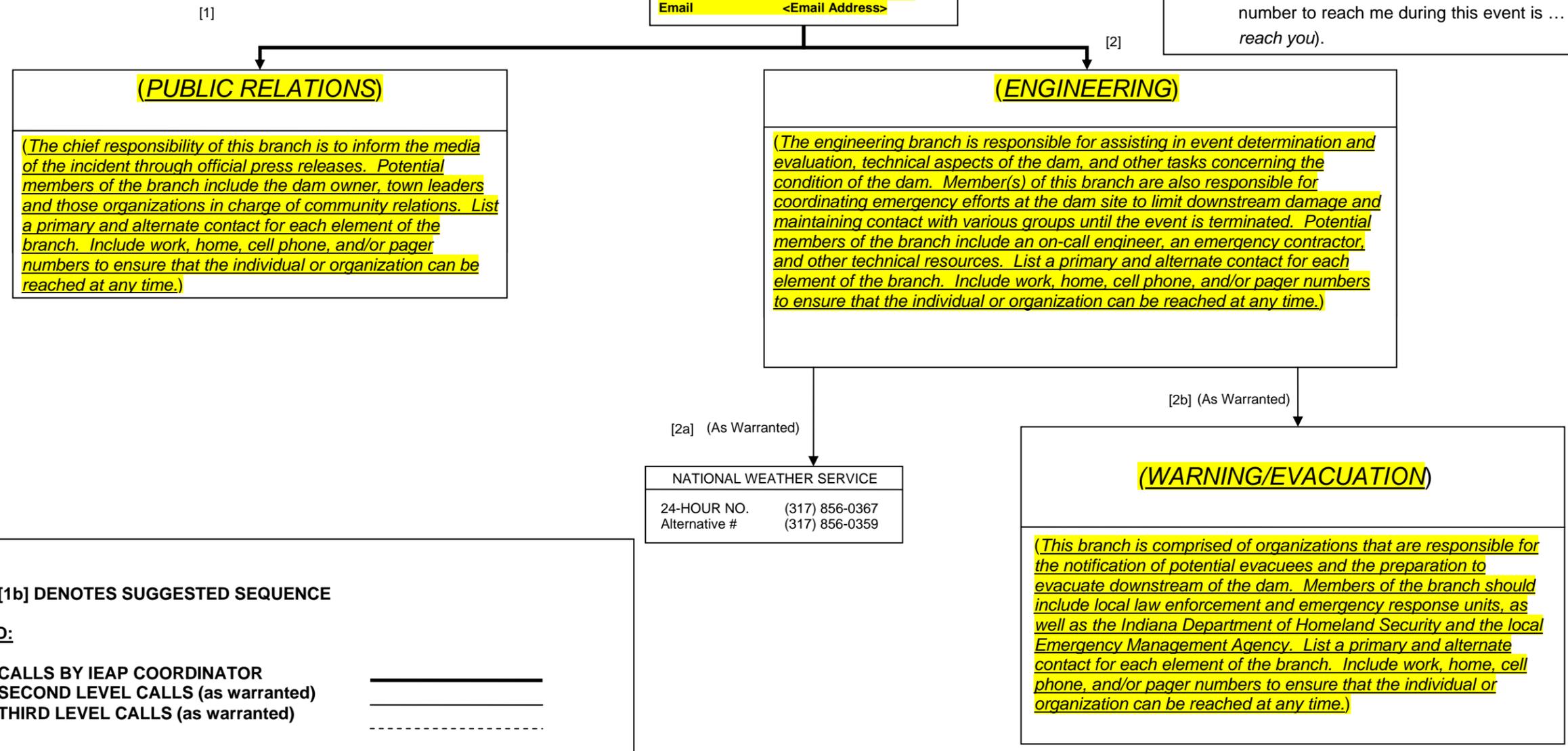
EVENT LEVEL 3 NOTIFICATION INDICENT, SLOWLY DEVELOPING

Person Observing or Learning of Incident → **(IEAP Coordinator)**

PRIMARY CONTACT	
<NAME>	<TELEPHONE NUMBER>
(Home)	<Telephone Number>
(Cell)	<Telephone Number>
Email	<Email Address>
ALTERNATE CONTACT	
<NAME>	<TELEPHONE NUMBER>
(Home)	<Telephone Number>
(Cell)	<Telephone Number>
Email	<Email Address>

Suggested IEAP Coordinator Message

- This is the **(IEAP Coordinator)**. I am making this call in accordance with the **(Template Lake Dam)** IEAP.
- An incident has been detected at **(Template Lake Dam)**.
- The IEAP has been activated, currently at an incident level (Level 3).
- If a problem occurs, flooding along **(Template Creek)** is possible.
- The situation is being monitored to determine if any evacuation warnings are necessary.
- We will keep you apprised of the situation. The best telephone number to reach me during this event is ... (state the best number to reach you).



(PUBLIC RELATIONS)

(The chief responsibility of this branch is to inform the media of the incident through official press releases. Potential members of the branch include the dam owner, town leaders and those organizations in charge of community relations. List a primary and alternate contact for each element of the branch. Include work, home, cell phone, and/or pager numbers to ensure that the individual or organization can be reached at any time.)

(ENGINEERING)

(The engineering branch is responsible for assisting in event determination and evaluation, technical aspects of the dam, and other tasks concerning the condition of the dam. Member(s) of this branch are also responsible for coordinating emergency efforts at the dam site to limit downstream damage and maintaining contact with various groups until the event is terminated. Potential members of the branch include an on-call engineer, an emergency contractor, and other technical resources. List a primary and alternate contact for each element of the branch. Include work, home, cell phone, and/or pager numbers to ensure that the individual or organization can be reached at any time.)

NATIONAL WEATHER SERVICE

24-HOUR NO.	(317) 856-0367
Alternative #	(317) 856-0359

(WARNING/EVACUATION)

(This branch is comprised of organizations that are responsible for the notification of potential evacuees and the preparation to evacuate downstream of the dam. Members of the branch should include local law enforcement and emergency response units, as well as the Indiana Department of Homeland Security and the local Emergency Management Agency. List a primary and alternate contact for each element of the branch. Include work, home, cell phone, and/or pager numbers to ensure that the individual or organization can be reached at any time.)

NOTE:

1) [1b] DENOTES SUGGESTED SEQUENCE

LEGEND:

1) CALLS BY IEAP COORDINATOR	_____
2) SECOND LEVEL CALLS (as warranted)	_____
3) THIRD LEVEL CALLS (as warranted)	-----

EVENT LEVEL 2 NOTIFICATION EMERGENCY EVENT, RAPIDLY DEVELOPING

[Note to preparer: Add a tab sheet before this page, with the tab label indicating "Figure 2.2." The notification flow chart is by no means limited to these sections. This is only meant to give a basic guideline of what types of organizations should be contacted in the case of an emergency event. Additional contacts can and should be added by the owner/operator as necessary to have an efficient IEAP command structure developed for rapid notification, communication and action. Contents should be relegated to vital emergency participants.]

Person Observing or Learning of Emergency →

(IEAP Coordinator)

PRIMARY CONTACT

<NAME> <TELEPHONE NUMBER>
 (Home) <Telephone Number>
 (Cell) <Telephone Number>
 Email <Email Address>

ALTERNATE CONTACT

<NAME> <TELEPHONE NUMBER>
 (Home) <Telephone Number>
 (Cell) <Telephone Number>
 Email <Email Address>

Suggested IEAP Coordinator Message

- This is the **(IEAP Coordinator)**. I am making this call in accordance with the **(Template Lake Dam)** IEAP.
- Problems have occurred with **(Template Lake Dam)**.
- The IEAP has been activated, currently at the emergency level (Level 2).
- Flooding along **(Template Creek)** is possible.
- **Prepare to evacuate** along the **(identify potential evacuees/ evacuation limits along Template Creek)**.
- We will keep you apprised of the situation. The best telephone number to reach me during this event is ... (state the best number to reach you).

[1] ↓

(WARNING/EVACUATION)

(This branch is comprised of organizations that are responsible for the notification of potential evacuees and the preparation to evacuate downstream of the dam. Members of the branch should include local law enforcement and emergency response units, as well as the Indiana Department of Homeland Security and the local Emergency Management Agency. List a primary and alternate contact for each element of the branch. Include work, home, cell phone, and/or pager numbers to ensure that the individual or organization can be reached at any time.)

(As Warranted) ↓

ENDANGERED RESIDENTS

DISPATCH TO CONTACT ENDANGERED RESIDENTS. (MESSAGE: **PREPARE TO EVACUATE**)

[2] ↓

(ENGINEERING)

(The engineering branch is responsible for assisting in event determination and evaluation, technical aspects of the dam, and other tasks concerning the condition of the dam. Member(s) of this branch are also responsible for coordinating emergency efforts at the dam site to limit downstream damage and maintaining contact with various groups until the event is terminated. Potential members of the branch include an on-call engineer, an emergency contractor, and other technical resources. List a primary and alternate contact for each element of the branch. Include work, home, cell phone, and/or pager numbers to ensure that the individual or organization can be reached at any time.)

[2a] (As Warranted) ↓

NATIONAL WEATHER SERVICE

24-HOUR NO. (317) 856-0367
 Alternative # (317) 856-0359

[3] ↓

(PUBLIC RELATIONS)

(The chief responsibility of this branch is to inform the media of the emergency event through official press releases. Potential members of the branch include the dam owner, town leaders and those organizations in charge of community relations. List a primary and alternate contact for each element of the branch. Include work, home, cell phone, and/or pager numbers to ensure that the individual or organization can be reached at any time.)

NOTE:

- 1) [1b] DENOTES SUGGESTED SEQUENCE
- 2) [R1a] DENOTES REDUNDENCY SEQUENCE

LEGEND:

CALLS BY PROPERTY MANAGER _____

SECOND LEVEL CALLS _____

THIRD LEVEL CALLS (as warranted) - - - - -

EVENT LEVEL 1 NOTIFICATION

EMERGENCY EVENT, IMMINENT DAM FAILURE OR FLASH FLOOD

[Note to preparer: Add a tab sheet before this page, with the tab label indicating "Figure 2.3." The notification flow chart is by no means limited to these sections. This is only meant to give a basic guideline of what types of organizations should be contacted in the case of an emergency event. Additional contacts can and should be added by the owner/operator as necessary to have an efficient IEAP command structure developed for rapid notification, communication and action. Contents should be relegated to vital emergency participants.]

Person Observing or Learning of Emergency

(IEAP Coordinator)

PRIMARY CONTACT

<NAME> <TELEPHONE NUMBER>
 (Home) <Telephone Number>
 (Cell) <Telephone Number>
 Email <Email Address>

ALTERNATE CONTACT

<NAME> <TELEPHONE NUMBER>
 (Home) <Telephone Number>
 (Cell) <Telephone Number>
 Email <Email Address>

Suggested IEAP Coordinator Message

- This is the **(IEAP Coordinator)**. I am making this call in accordance with the **(Template Lake Dam)** IEAP.
- Problems have occurred with **(Template Lake Dam)**.
- The IEAP has been activated, currently at the highest emergency level (Level 1).
- Flooding along **(Template Creek)** is possible.
- **Immediately evacuate** along the **(identify potential evacuees/evacuation limits along Template Creek)**.
- We will keep you apprised of the situation. The best telephone number to reach me during this event is ... (state the best number to reach you).

[1]

(WARNING/ EVACUATION)

(This branch is comprised of organizations that are responsible for the notification of potential evacuees and the preparation to evacuate downstream of the dam. Members of the branch should include local law enforcement and emergency response units, as well as the Indiana Department of Homeland Security and the local Emergency Management Agency. List a primary and alternate contact for each element of the branch. Include work, home, cell phone, and/or pager numbers to ensure that the individual or organization can be reached at any time.)

[2]

(ENGINEERING)

(The engineering branch is responsible for assisting in event determination and evaluation, technical aspects of the dam, and other tasks concerning the condition of the dam. Member(s) of this branch are also responsible for coordinating emergency efforts at the dam site to limit downstream damage and maintaining contact with various groups until the event is terminated. Potential members of the branch include an on-call engineer, an emergency contractor, and other technical resources. List a primary and alternate contact for each element of the branch. Include work, home, cell phone, and/or pager numbers to ensure that the individual or organization can be reached at any time.)

[3]

(PUBLIC RELATIONS)

(The chief responsibility of this branch is to inform the media of the emergency event through official press releases. Potential members of the branch include the dam owner, town leaders and those organizations in charge of community relations. List a primary and alternate contact for each element of the branch. Include work, home, cell phone, and/or pager numbers to ensure that the individual or organization can be reached at any time.)

(As Warranted)

ENDANGERED RESIDENTS

DISPATCH TO CONTACT ENDANGERED RESIDENTS. (MESSAGE: **EVACUATE IMMEDIATELY!**)

[2a] (As Warranted)

NATIONAL WEATHER SERVICE

24-HOUR NO. (317) 856-0367
 Alternative # (317) 856-0359

NOTE:

1) [1b] DENOTES SUGGESTED SEQUENCE
 2) [R1a] DENOTES REDUNDANCY SEQUENCE

LEGEND:

CALLS BY PROPERTY MANAGER _____
 SECOND LEVEL CALLS _____
 THIRD LEVEL CALLS (as warranted) - - - - -

[Note to preparer: Add a tab sheet before this page with the tab label indicating “Table 3.1.”]

SECTION 3. EXPECTED ACTIONS

3.1 Action Data Sheets

After the IEAP Coordinator (or Acting IEAP Coordinator) has determined the event level and has made the appropriate notifications, the IEAP Coordinator shall take action, using the Action Data Sheets as a guide. Table 3.1 is an index of the Action Data Sheets.

The Action Data Sheets should be reviewed the Engineering Director or designee and/or the On-Call Engineer when possible and time permits. If an event is not covered, adapt an Action Data Sheet of a similar event and event level. If resources described in the Action Data Sheets are not available, adapt with the available resources.

**Table 3.1
Action Data Sheet Index**

Event	Event Level	Action Data Sheet
Flooding	3	A3
	2	A2
	1	A1
Earthquake	3	B3
	2	B2
	1	B1
Seepage	3	C3
	2	C2
	1	C1
Cracking	3	D3
	2	D2
Movement	3	E3
	2	E2
Overtopping	1	F1
Gate Failure	3	G3
	2	G2
	1	G1
Blocked Gates	3	H3
Instruments	3	I3
Sabotage	3	J3
	2	J2
	1	J1

[Include only the events and event levels that correspond with Table 1.1.]

IEAP for **(Template Lake Dam)**

Compose a separate Action Data Sheet for each entry. These should not exceed one page in length. Using the Action Data Sheet templates provided as guides, the preparer should add similar pages for the other event types (e.g. earthquake, seepage, etc.) applicable to the dam]

<p>EVENT: (FLOODING) LEVEL: 3 (incident, slowly developing)</p>	<p>Sheet A3</p>	
<p>RECOMMENDED ACTIONS</p>		
<p>(IEAP Coordinator):</p> <ul style="list-style-type: none"> A. Make sure notifications on Figure 2.1 have been made. B. <i>(Describe a course of action that closely monitors the situation. Careful observation and inspection of every part of the dam is necessary; this should be done without compromising the safety of anyone performing these tasks. Clearly describe potential problems so that the individual(s) carrying out the inspection know what may be dangerous. Off-site areas and/or instrumentation may also need to be monitored. If necessary, confer with the On-Call Engineer and/or the Engineering Director or designee to determine any preventative action that must be taken. Additionally, develop a plan to avoid dam failure and minimize damage downstream.)</i> C. Record all information, observations, and actions on an Event Log Form (Form 3.1). D. Contact the (Engineering Director or designee) at least daily to report the latest observations and conditions. If conditions change significantly, contact the (Engineering Director or designee) immediately. <p>(Engineering Director or designee):</p> <ul style="list-style-type: none"> A. <i>(Describe a course of action to be followed by this position. In general, this will be to review all pertinent information in order to recommend appropriate actions to the IEAP Coordinator. If necessary, contact local emergency contractors and/or other individuals that may be able to assist in monitoring the situation.)</i> <p>(On-Call Engineer):</p> <ul style="list-style-type: none"> A. Provide decision support and technical support to the (Engineering Director or designee) as appropriate. 	<p>Time/Date Completed</p>	
<p>EVALUATION / DECISION</p>		
<p>Evaluate conditions at least daily, or whenever conditions change significantly. Using Table 1.1 and/or Table 3.1, determine whether:</p> <ul style="list-style-type: none"> A) The event can be terminated (Specify parameters for which this is an acceptable decision) B) The event remains at the current Event Level 3 (Specify parameters for which this is an acceptable decision). C) The event warrants escalation to Event Level 2 (Specify parameters for which this is an acceptable decision). <p>Based on this determination, follow the appropriate actions below.</p>		
<p>A) TERMINATION Go to Termination and Follow-up (Section 4)</p>	<p>B) EVENT LEVEL 3 Continue recommended actions on this sheet</p>	<p>C) EVENT LEVEL 2 Go to Event Level 2 or Event Level 1 Notification Chart</p>

IEAP for **(Template Lake Dam)**

<p>EVENT: (FLOODING)</p> <p>LEVEL: 2 (emergency event, rapidly developing)</p>	<p>Sheet A2</p>	
<p>RECOMMENDED ACTIONS</p>		
<p>(IEAP Coordinator):</p> <p>A. Make sure notifications on Figure 2.2 have been made.</p> <p>B. <i>(Describe a course of action that closely monitors the situation. Careful observation and inspection of every part of the dam is necessary; this should be done without compromising the safety of anyone performing these tasks. Clearly describe potential problems so that the individual(s) carrying out the inspection know what may be dangerous. Off-site areas and/or instrumentation may also need to be monitored. If necessary, confer with the On-Call Engineer and/or the Engineering Director or designee to determine any preventative action that must be taken. Additionally, develop a plan to avoid dam failure and minimize damage downstream.)</i></p> <p>C. Record all information, observations, and actions on an Event Log Form (Form 3.1).</p> <p>D. Contact the (Engineering Director or designee) at least daily to report the latest observations and conditions. If conditions change significantly, contact the (Engineering Director or designee) immediately.</p> <p>(Engineering Director or designee):</p> <p>A. <i>(Describe a course of action to be taken by this position. In general, this will be to review all pertinent information in order to recommend appropriate actions to the IEAP Coordinator. If necessary, contact local emergency contractors and/or other individuals that may be able to assist in monitoring the situation.)</i></p> <p>(On-Call Engineer):</p> <p>A. Provide decision support and technical support to the (Engineering Director or designee) as appropriate.</p>	<p>Time/Date Completed</p>	
<p>EVALUATION / DECISION</p>		
<p>Evaluate conditions at least twice daily, or whenever conditions change significantly. Using Table 1.1 and/or Table 3.1, determine whether:</p> <p>A) The event warrants downgrade to Event Level 3 <i>(Specify parameters for which this is an acceptable decision)</i>. All contacts on Event Level 2 Notification Flow Chart shall be notified of downgrade from Event Level 2 to Event Level 3.</p> <p>B) The event remains at the current Event Level 2 <i>(Specify parameters for which this is an acceptable decision)</i>.</p> <p>C) The event warrants escalation to Event Level 1 <i>(Specify parameters for which this is an acceptable decision)</i>.</p> <p>Based on this determination, follow the appropriate actions below.</p>		
<p>A) EVENT LEVEL 3</p> <p>Go to Event Level 3 Notification Chart</p>	<p>B) EVENT LEVEL 2</p> <p>Continue recommended actions on this sheet</p>	<p>C) EVENT LEVEL 1</p> <p>Go to Event Level 1 Notification Chart</p>

IEAP for Template Lake Dam

EVENT: <u>FLOODING</u> LEVEL: 1 (emergency event, imminent dam failure or flash flooding)	Sheet A1
RECOMMENDED ACTIONS	
<p><u>IEAP Coordinator</u>:</p> <ul style="list-style-type: none"> A. Make sure notifications on Figure 2.3 have been made. B. <u>(Describe a course of action that closely monitors the situation. If necessary, confer with the On-Call Engineer and/or the Engineering Director or designee to determine any preventative action that must be taken. In most cases, dam failure will be imminent, so most efforts should be directed toward the minimization of human loss of life, injury or property damage.)</u> C. Record all information, observations, and actions on an Event Log Form (Form 3.1). D. Establish a means to keep in frequent contact with the <u>Engineering Director or designee</u> until Event Level 1 is terminated. <p><u>Engineering Director or designee</u>:</p> <ul style="list-style-type: none"> A. <u>(Describe the course of action to be followed by this position. In general, this will be to review all pertinent information in order to recommend appropriate actions to the IEAP Coordinator. If necessary, contact local emergency contractors and/or other individuals that may be able to assist in monitoring the situation.)</u> <p><u>On-Call Engineer</u>:</p> <ul style="list-style-type: none"> A. Provide decision support and technical support to the <u>Engineering Director or designee</u> as appropriate. Send a qualified individual to the site as soon as possible. 	Time/Date Completed
EVALUATION / DECISION	
Evaluate the situation as events progress, or whenever conditions change. Determine whether: <ul style="list-style-type: none"> A) The event remains at the current Event Level 1. B) The event can be terminated <u>(Specify parameters for which this is an acceptable decision)</u>. Based on this determination, follow the appropriate actions below.	
A) EVENT LEVEL 1	B) TERMINATED
Continue recommended actions on this sheet	Go to Termination and Follow-up (Section 4)

3.2 Locally Available Equipment, Labor, and Materials

(Provide a list of resources stored on-site that are available in an emergency.)

Additionally, supply a list of the address and phone number(s) of any nearby companies (e.g. heavy equipment rental, crane service, etc.) that may be needed and are willing to provide service in the case of an emergency event. Since dam emergencies do not just occur during business hours, it is important that these companies have a 24-hour contact number.)

3.3 Incident or Emergency Event Log

Use the Incident or Emergency Event Log (Form 3.1) on next page to record actions and events during an Incident or Emergency Event and the time that the action or event occurred. A copy of this form is also provided in the inside pocket of the front cover of binder for use during an active event.

SECTION 4

TERMINATION AND FOLLOW-UP

Once IEAP operations have begun under Event Level 3, 2, or 1, the IEAP operations must eventually be terminated and follow-up procedures completed. As shown on Figure i, IEAP operations can only be terminated after completing operations under Event Level 3 or 1. If Event Level 2 is declared, the operations must be designated Event Level 3 or 1 before terminating the IEAP operations.

4.1 Termination Responsibilities

(Identify the individual responsible for terminating IEAP operations. This must not necessarily be the IEAP Coordinator. Describe notification protocol to be followed once IEAP activities have been terminated.)

Outline any special actions that are to be taken prior to termination of a Level 1 event that did not result in dam failure. These actions should ensure the safety of people and property downstream. Do not terminate the IEAP unless it is certain that there is no further threat.)

4.2 Follow-up

Event Level 3 – (Describe the IEAP review process following the termination of a Level 3 event. Ensure that all parties that participated in the IEAP activities are involved in the review process. Impose a time frame within which the review is to be completed. During the review, document any IEAP procedures that were followed effectively, as well as any ways that the IEAP could be improved, and insert this document into Appendix C of the IEAP.)

Event Level 2 or 1 – (Describe the IEAP review process following the termination of a Level 2 or 1 event. Ensure that all parties that participated in the IEAP activities are involved in the review process. Impose a time frame within which the review is to be completed. During the review, document any IEAP procedures that were followed effectively, as well as any ways that the IEAP could be improved, and insert this document into Appendix C of the IEAP. In addition, note any extra measures that must be taken due to the increased severity of the event.)

Event That Has Caused Loss of Life, Injury or Property Damage – (In addition to the course of action outlined above for Event Level 2 or 1, note any special procedures that must be followed in the event of loss of life, injury or property damage. In general, a closer look should be taken at the IEAP operations. As before, impose a reasonable time frame on the completion of these activities, and insert any conclusions into Appendix C of the IEAP.)

SECTION 5 MAPS, FIGURES AND SUPPORTING DATA

(Include any maps and figures that may prove useful during IEAP operations. Typically, these include:

- Location and Vicinity Map
- Emergency Access Routes Map
- Estimated Dam Failure Flood Inundation Map
- Reservoir Area and Capacity Curve
- Principal Spillway Rating Curve
- Emergency Spillway (Top of the Dam) Rating Curve
- Annotated Site Pictures
- Schematic Plan of the Dam

Depending on the specific dam, one or more of the above-mentioned exhibits may not be appropriate. Similarly, include any other maps, charts or figures deemed relevant in the case of an emergency event.)

APPENDIX A WARNING AND EVACUATION

This appendix is available for inserting local warning and evacuation plans developed by *(the Warning/Evacuation branch)*.

APPENDIX B INUNDATION MAP DOCUMENTATION

INUNDATION AREA

(Describe in detail the dam-failure flood inundation map provided in Section 5. Explain the method and model(s), if appropriate, used to calculate this data, making sure to thoroughly document all assumptions. Present the results from the analysis in a manner that complements the dam-failure flood inundation area map. If appropriate, summarize the numerical results in tabular format at the end of the appendix. Include cross-section number, miles downstream of dam, maximum flow, maximum elevation, maximum depth, time to peak, and flood wave arrival data.)

(It is strongly suggested that a detailed dam breach analysis utilizing appropriate modeling techniques be undertaken as part of the IEAP preparation process. However, in lieu of timely availability of a detailed dam breach analysis, a Rule-of-Thumb determination of potential dam-failure inundation limits may be made by conservatively assuming the breach flood wave height just downstream of the dam as $0.4H$, where H is the total dam height. Then assume that the breach flood wave height would be halved every 10 miles downstream of the dam. In other words, the breach flood wave height is assumed at $0.3H$ at a point approximately 5 miles downstream the dam and $0.2H$ at a point approximately 10 miles downstream the dam, so on, until the breach flood wave height is generally contained within channel limits and/or to the point where no other downstream structures would be impacted. The breach wave heights in between each 5-mile estimation point may be interpolated from the above estimates. Once the estimated breach wave height is determined for various points along the downstream stream reach as discussed above, these calculated breach flood wave heights would then need to be added to the flow line elevation at each point to calculate the expected dam failure inundation elevation at that point. An approximate dam-failure inundation map could then be generated by drawing the limit of inundation resulting from the calculated elevations.)

EMERGENCY EVACUATION PLANNING ZONES

(Emergency evacuation planning zones are specific segments or portions of dam-failure flood inundation areas downstream from Template Lake Dam that:

1. Define the potential area of impact resulting from each type and/or severity of event.
2. Allow response personnel to prioritize evacuation activities for the populations at risk in terms of distance downstream from the dam and flood wave travel times.

Local response organizations should define appropriate emergency evacuation planning zones and appropriate evacuation centers in emergency operations appendices specific to Template Lake Dam.)

APPENDIX C PAST IEAP ACTIVITY

This Appendix is the placeholder for copies of past IEAP activity reports, Annual Review Verification Statements that must be completed after the annual review is performed, and Periodic Test Memos to be included after periodic tests have been performed.

APPENDIX D IEAP REVIEW AND REVISION

IEAP Annual Review

(Identify the individual responsible for conducting the annual review of the IEAP. Explain in detail the review procedure and all parties involved. Describe what, if any, post-review actions should be taken. Note that an IEAP Annual Review Verification Statement should be completed upon conclusion of the review.)

IEAP Periodic Test

(Identify the individual responsible for coordinating the Periodic Test of the IEAP. Explain in detail the components of the test and all those expected to participate. Describe any post-test actions and their implications for the IEAP.)

Revision

(Identify the individual responsible for ensuring that the IEAP documents are revised. The IEAP held by this individual is the master document. Explain the procedure by which revisions are made, and how to ensure that changes are made in all existing copies of the IEAP. Emphasize the necessity that all copies remain updated and identical.)

FORM D.1
IEAP ANNUAL REVIEW VERIFICATION STATEMENT

Name of Dam: Template Lake Dam

Date of Drill: _____

- A. The current IEAP is on hand and all revisions have been inserted.
- B. The emergency procedures observed during the drill were in accordance with the IEAP.
- C. The readiness evaluated in the drill was acceptable.
- D. The communications network is correct and was verified.
- E. The training of personnel is sufficient and acceptable.
- F. The IEAP Annual Review procedures were followed.

Additional Comments: _____

(individual responsible for conducting
IEAP Annual Review)

Date

(printed name)

(IEAP Coordinator)

Date

(printed name)

APPENDIX E IEAP DISTRIBUTION

(List the individuals that maintain a copy of the IEAP document. Include name, title, address, telephone number, email address, and IEAP copy number. Note that the number of recipients must be kept at a minimum in order to ensure efficient updates.)

APPENDIX F SUPPLEMENTARY INFORMATION

This appendix contains background information and pertinent data, and is also the place holder for any other key supplementary information such as emergency materials, service contracts, and any other relevant material for **(Template Lake Dam)** and other similar information that may be placed in this appendix by individual plan holders for quick reference during an event.

PERTINENT DATA¹

A. GENERAL	
Name of Dam	
Name of Reservoir	
Owner	
County	
River or Stream	
Watershed Basin	
National Inventory of Dams Number	
Hazard Potential Classification	
Required Spillway Capacity (% PMF Design Flood)	
Year Constructed	
Legal Description (of Dam)	
Latitude	
Longitude	
B. DAM	
Type	
Crest Elevation (ft., NAVD 1988)	
Crest Width (feet)	
Crest Length (feet)	
Embankment Height (feet)	
Upstream Slope	
Downstream Slope	
C. SPILLWAY SYSTEM	
1. Principal Spillway	
Type	
Control Sill Elevation	
Dimensions	
Freeboard above Control Sill Elevation (feet)	
Discharge during Design Storm (cfs)	
Terminal Structure	

PERTINENT DATA (CONT'D)

2. Emergency Spillway	
Type	
Control Sill Elevation (ft, NAVD 1988)	
Length of Control Section (feet)	
Freeboard above Control Sill Elevation (feet)	
Discharge during Design Storm (cfs)	
Terminal Structure	
3. Combined Spillway	
Total Spillway Discharge Capacity (cfs)	
Freeboard at Peak of Design Flood (feet)	
D. OUTLET WORKS (Drawdown Facility)	
Type	
Dimensions	
Control Structure (valve, gate, stoplogs, etc.)	
Inlet / Outlet Inverts (ft, NAVD 1988)	
Discharge Capacity at Normal Pool (cfs)	
E. RESERVOIR	
Normal Pool Elevation (Feet)	
Reservoir Area at Normal Pool (Acres)	
Estimated Storage at Normal Pool (Acre-feet)	
Reservoir Area at Top of Dam (Acres)	
Estimated Storage at Top of Dam (Acre-feet)	
F. DRAINAGE BASIN	
Drainage Area (square miles)	
Description	

NOTES: 1. **Identify the document/study/inspection from which the pertinent data was gathered.**

APPENDIX G

GLOSSARY

Abutment. The undisturbed natural material of the valley side against which the dam is constructed. The left and right abutments are defined as being on the right and left side of an observer looking downstream.

Acre-Foot. A term used in measuring the volume of water that would cover one acre to a depth of one foot. It is equal to 43,560 cubic feet.

Appurtenant structure. A structure necessary for the operation of a dam such as outlets, trash racks, valves, spillways, power plants, tunnels, etc.

Breach. An eroded opening through a dam that drains the reservoir. A controlled breach is a constructed opening. An uncontrolled breach is an unintentional opening that allows uncontrolled discharge from the reservoir.

Channel. A general term for any natural or artificial watercourse.

Conduit. A closed channel to convey water through, around, or under a dam.

Culvert. A closed channel to convey water.

Crest of Dam. Top of dam.

Cross section. A sectional view of a dam formed by passing a plane through the dam perpendicular to the axis.

Dam. A barrier constructed across a watercourse for the purpose of impounding or diverting water.

- a. Embankment dam. Any dam constructed of excavated natural materials or of industrial waste materials.
- b. Concrete dam. Any dam constructed of concrete materials.

Dam failure. The uncontrolled release of reservoir contents.

Drain, toe. A system of pipe and/or pervious material along the downstream toe of a dam used to collect seepage from the foundation and embankment and convey it to a free outlet.

Drainage area. The area that drains to a particular point on a river or stream.

Drawdown. The difference between a water level and a lower water level in a reservoir within a particular time. Used as a verb, it is the lowering of the water surface due to release of water from the reservoir.

IEAP Operations. All actions taken by the dam owner and other involved agencies to address an incident or emergency event.

Earthquake. A sudden motion or trembling in the earth caused by the abrupt release of accumulated stress along a fault.

Incident and Emergency Action Plan (IEAP). A comprehensive, single-source document providing accurate and current instructions intended to help dam owners/operators save lives, minimize property damage, and minimize environmental impacts caused by large releases from a dam, dam failure, or other events that present hazardous conditions.

Emergency Event. An event which takes place or a condition which develops that is of a serious nature that may endanger the dam, or endanger persons or property, and demands immediate attention.

Filter (filter zone). A band of granular material graded (either naturally or by selection) so as to allow seepage through or within the layers while preventing the migration of material from adjacent zones.

Flood. A temporary rise in water levels resulting in inundation of areas not normally covered by water; may be expressed in terms of probability of exceedance per year such as one percent chance flood or expressed as a fraction of the probable maximum flood of other reference flood. Some related terms are:

- a. Flood, Inflow Design (IDF). That flood used in the design of a safe dam and its appurtenant works particularly for sizing the spillway and outlet works, and for determining maximum temporary storage and height of dam requirements.
- b. Flood, Probable Maximum (PMF). The largest flood reasonably expected at a point on a stream because of a probable maximum storm and favorable runoff conditions.

Freeboard. Vertical distance between a stated water level and the top of dam.

Gate. A movable, watertight barrier for the control of water.

- a. Outlet gate. A gate controlling the flow of water through a reservoir outlet.
- b. Slide gate (sluice gate). A gate that can be opened or closed by sliding in supporting guides.

Height, hydraulic. The vertical distance between the maximum design water level and the lowest point in the original streambed.

Height, structural. The vertical distance between the lowest point on the dam crest and the lowest point of the excavated foundation.

Hydrograph, breach or dam failure. A flood hydrograph resulting from a dam breach.

Hydrograph, flood. A graphical representation of the flood discharge with respect to time for a particular point on a stream or river.

Hydrograph, unit. A hydrograph with a volume of one inch of runoff resulting from a storm of a specified duration and aerial distribution. Hydrographs from other storms of the same duration and distribution are assumed to have the same time base but with ordinates of flow in proportion to the runoff volumes.

Incident. An unusual event which takes place, or a condition which is slowly developing, that is not normally encountered in the routine operation of the dam and reservoir, or necessitates a variation from the operating procedures. Such events are more common than emergency conditions and often offer time to conduct preplanned responses to the slowly developing situation. If addressed in a timely manner, such events can often be prevented from progressing into a much worse event.

Incident Command System (ICS). A management system designed to control personnel, equipment, supplies, and communications at the scene of an incident or emergency event. An Incident Command System is typically deployed at the beginning of an event until the management of the on-scene operations are no longer needed. The structure of the Incident Command System can be expanded or contracted depending on the changing needs of the event. The Incident Command System allows agencies of all kinds to effectively communicate using common terminology.

Incident Manager. The Incident Manager is the highest ranking official available at the scene of an incident or emergency event. All personnel involved in the operating procedures of the dam or emergency operations should be trained in the fundamentals of ICS.

Instrumentation. An arrangement of devices installed into or near dams (i.e., piezometer, inclinometer, strain gage, survey points, etc.) that provide measurements that can be used to evaluate performance parameters of a structure.

Intake. Any structure in a reservoir, dam or river for the purpose of directing water into a conduit, tunnel, canal or pipeline.

Inundation map. A map delineating the area that would be submerged by a particular flood event.

Length of dam. The length along the top of the dam between contact abutments. This also includes the spillway, power plants, navigation lock, fish pass, etc., where these form part of the length of the dam. If detached from the dam, these structures should not be included.

Outlet. An opening through which water can be discharged.

Parapet wall. A wall built along the top of a dam (upstream or downstream edge) used for safety of vehicles and pedestrians, to prevent overtopping caused by wave runoff, or ornamentation.

Phreatic surface. The free surface of water seeping at atmospheric pressure through soil or rock.

Piezometer. An instrument for measuring pressure head.

Piping. The progressive development of internal erosion by seepage appearing downstream as a hole or seam discharging water containing soil particles.

Probability. The likelihood of an event occurring within a given period of time.

Probable Maximum Flood (PMF). The maximum runoff condition resulting from the most severe combination of hydrologic and meteorological conditions that are considered reasonably possible for the drainage basin under study.

Probable Maximum Precipitation (PMP). Theoretically, the greatest depth of precipitation for a given duration that is physically possible over a given size storm area at a particular geographical location.

Public Information Officer (PIO). A Property staff member designated by the (IEAP Coordinator). During IEAP operations, the PIO will be the contact person at the Property for the media, and will keep the media informed of the IEAP operations.

Relief Wells. A line of vertical wells or boreholes to facilitate drainage of the foundation and abutments and to reduce water pressure.

Reservoir. A body of water impounded by a dam and in which water can be stored.

Reservoir surface area. The area covered by a reservoir when filled to a specified level.

Riprap. A layer of stone, precast blocks, bags of cement or other suitable material, generally placed on the upstream slopes of an embankment or along a watercourse as protection against wave action, erosion, or scour. It consists of pieces of relatively large size as distinguished from a gravel blanket.

Seepage. Flow or movement of water through a dam, its foundation, or its abutments.

Slope. Inclination from the horizontal, measured as the ratio of horizontal units to corresponding vertical units.

Spillway. A structure over or through which flow is discharged from a reservoir. If the rate of flow is controlled by mechanical means such as gates, it is considered a controlled spillway. If the elevation of the spillway crest is the only control, it is considered an uncontrolled spillway.

Spillway channel. An 'open channel or closed conduit conveying water from the spillway inlet downstream.

Spillway crest. The lowest level at which water can flow over or through the spillway.

Spillway, chute. An inclined channel, usually separate from the dam, to convey reservoir overflow into the natural channel below the dam or into an adjacent natural drainage channel.

Standing Operating Procedures (SOP). A comprehensive, single-source document providing accurate and current instructions for normal operation, maintenance, monitoring, and inspection of a dam and appurtenant features.

Stoplogs. Timbers or steel beams placed on top of each other with their ends held in guides on each side of a channel or conduit so as to provide a cheaper or more easily handled means of temporary closure than a bulkhead gate.

Storage. The retention of water or delay of runoff either by planned operation, as in a reservoir, or by temporary filling of overflow areas, as in the progression of a flood wave through a natural stream channel. Definitions of specific types of storage in reservoirs are:

- a. Dead Storage. The reservoir volume between the invert of the lowest intake and the reservoir bottom.
- b. Active Storage. The reservoir volume between the normal reservoir water surface elevation and the invert of the lowest intake.

c. Flood Storage. The reservoir volume between the crest of the dam and the normal reservoir water surface elevation.