**Guidelines for Owner Completion of the Emergency Action Plan (EAP) (Template)**

* Replace all highlighted text (MAGENTA and BLUE) with the appropriate information. **Once the document is final, please remove all highlighting**.
* If you need assistance in completing portions of this template highlighted in BLUE, information may be obtained from the Division of Energy, Mineral and Land Resources at (919) 707-9220 or [DamSafety@ncdenr.gov](mailto:DamSafety@ncdenr.gov).
* A list of county Emergency Managers is available at <https://www.ncdps.gov/emergency-management/em-community/directories/counties>. Contact your relevant Emergency Manager to ensure all addresses and contacts are current and that the implementation of EAPs have not instead been delegated to a local program in your area.
* **EAPs are required to be updated and resubmitted annually to the North Carolina Dam Safety Program, one year from the anniversary date of the most recent approval**. Before this resubmittal, the EAP should be reviewed for correctness and modified to include any changes to the downstream hazards. If no updates are necessary to the EAP at the time of annual resubmittal, update the date of the EAP on each page and include a cover letter that states there have been no changes in the last year when resubmitting. **The annually resubmitted EAP must use the most current EAP template available on the Dam Safety website at:** <https://deq.nc.gov/about/divisions/energy-mineral-and-land-resources/dam-safety/planning-dam-emergency>. The North Carolina Dam Safety Program recommends that a periodic test, including a tabletop exercise, is conducted prior to the annual resubmission of the EAP.
* Downstream inundation maps are required for all EAPs. Inundation maps should be developed using an engineering computer model (e.g., HEC-RAS Unsteady Model, or other two-dimensional hydraulic analysis model, etc.), as referenced in FEMA P-946, Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures. The HEC-RAS models are available to anyone at no cost from the US Army Corps of Engineers at: <https://www.hec.usace.army.mil/software/hec-ras/>.
  + The method used should include labeled two-foot interval topographic contours.
  + All electronic files and models must be submitted each time the EAP is submitted.
  + The inundation map should depict both the **Sunny-Day Breach** (simulating a piping failure with the reservoir at normal pool elevation) and the **Rainy-Day Breach** (simulating an overtopping failure at maximum pool elevation during passage of the SDF) inundation zones. The two scenarios may be shown on the same map or set of maps using different colors.
  + Note that using the 100-year flood elevations to determine “at risk” structures is not an appropriate methodology to satisfy this requirement.
  + The inundation map must clearly show all impacted structures, roads, railroads, and other well-known features (located within the inundation zone extent) and reference each on Residents/Business/Roads/Infrastructure at Risk (Table 5.1).
  + Provide all supporting methodology used to develop the inundation map including: **methodology used, assumptions made, modeling software used (if any), electronic files of the models, associated inputs, date of creation, legend table, compass, topographic contours, scale size,** and **direction arrows**.
* The North Carolina Dam Safety Program generally revises the EAP template (on an as-need basis) and associated guidance in January of each year. All submitted EAPs must use the most current EAP template available on the Dam Safety website at: <https://deq.nc.gov/about/divisions/energy-mineral-and-land-resources/dam-safety/planning-dam-emergency>.

|  |  |
| --- | --- |
| When completed, submit **one** **electronic copy** to  **🡪** | North Carolina Dam Safety Program (DamSafety@ncdenr.gov)  Division of Energy, Mineral and Land Resources  1612 Mail Service Center  Raleigh, North Carolina 27699-1612  Phone: (919) 707-9220 |

Dam Name

**Emergency Action Plan (EAP)**

**State ID (First 5 Letters of County): COUNT-XXX**

**National Inventory of Dams ID (NID): NCXXXXX**

**County Name, North Carolina**

Revision Number: 01

Month, Year

Dam Owner/Operator:

Name, Email,

Physical Address,

Phone Number (24-Hour Emergency)

EAP Coordinator:

Name, Email,

Phone Number (Office),

Phone Number (24-Hour Emergency)

Dam Owner’s Engineer (**Select as Appropriate**):

Name, Email,

Phone Number (Office),

Phone Number (24-Hour Emergency)

Or:

No Engineer at Time of EAP Preparation

Map

Description automatically generated

**Include a vicinity map for your dam that includes and adequately shows neighboring towns, major roads, and the location of your dam here. Include a location marker clearly identifying your dam along with the latitude and longitude coordinates. You may use a web-based mapping application (e.g. Google Maps) for this requirement.**

## Table of Contents

**Dam Name**

**State ID: COUNT-XXX**

**EAP Overview**

EAP Flowchart 2

Summary of EAP Process 3

Statement of Purpose 3

1. **Step 1: Event Detection and Level Determination**

1.1 Event Detection 5

1.2 Emergency Level Definitions 5

1.3 Event Level Determination Guidance and Action Data Sheet Index 6

1. **Step 2: Notifications and Communication**

2.1 **Event Level 3, GREEN - Unusual event, slowly developing**……………………………..……..8

2.2 **Event Level 2, YELLOW - Potential dam failure situation, rapidly developing**………….......9

2.3 **Event Level 1, RED - Urgent!! Dam failure imminent or is in progress**…………………….. 10

1. **Step 3: Expected Actions**

3.1 Action Data Sheets……………………………………………………………………………….. 12

3.2 Unusual or Emergency Event Log………………………………………………………………...40

1. **Step 4: Termination and After-Action Review**

4.1 Termination Responsibilities……………………………………………………………………...43

4.2 After-Action Review……………...……………………………………………………………….43

1. **Maps, Figures, and Supporting Data**

5.1 Directions and Emergency Access Routes Map 47

5.2 Downstream Inundation Study 50

5.3 NC Inventory of Dams Data Sheet 52

**TABLE**

Table 1.3 Event Level Determination Guidance and Action Data Sheet Index 6

Table 5.1 Residents/Businesses/Roads/Infrastructure at Risk 49

**FIGURES**

Figure 1.0 EAP Flowchart 2

Figure 2.1 Notification Flowchart, **Event Level 3, GREEN** 8

Figure 2.2 Notification Flowchart, **Event Level 2, YELLOW** 9

Figure 2.3 Notification Flowchart, **Event Level 1, RED** 10

Figure 5.1 Directions and Emergency Access Routes Map 47

Figure 5.2 Downstream Inundation Study 50

Figure 5.3 NC Inventory of Dams Data Sheet 52

**FORMS**

Form 3.2 Unusual or Emergency Event Log …40

**APPENDICES**

Appendix A Roles, Responsibilities, and Authority 54

Appendix B Emergency Services Contacts 56

Appendix C Locally Available Resources (Equipment, Labor, and Materials) 58

Appendix D Record of EAP Annual Review, Revision, and Periodic Test 59

Appendix E Record of Revisions and Updates 60

Appendix F EAP Distribution Log 61

Appendix G Engineering Documents 62

Appendix H Glossary of Terms 63

# EAP Overview

## Figure 1.0 – EAP Flowchart



## Summary of EAP Process

There are four steps that must be followed anytime an unusual or emergency event is detected at ***Dam Name***. The four steps are:

**Step 1: Event Detection and Level Determination**

During the initial step, an unusual event or emergency event is detected at the dam and classified by the ***EAP Coordinator*** into one of the following event levels (reference Table 1.3):

**Event Level 3, GREEN**: Unusual event, slowly developing.

**Event Level 2, YELLOW**: Potential dam failure situation, rapidly developing.

**Event Level 1, RED**: Urgent!! Dam failure imminent or is in progress.

**Step 2: Notifications and Communication**

After the event level has been determined, notifications are made in accordance with the appropriate notification flowchart provided in Step 2 of this EAP.

**Step 3: Expected Actions**

After the initial notifications are made, the ***EAP Coordinator*** should refer to Table 1.3 and confer with the ***Dam Owner’s Engineer (if applicable)*** to develop and execute appropriate preventative actions. During this step of the EAP, there is a continuous process of taking action, assessing the status of the situation, and keeping others informed through communication channels established during the initial notifications. The EAP may go through multiple event levels during Steps 2 and 3 as the situation either improves or worsens.

**Step 4: Termination and After-Action Review**

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

## Statement of Purpose

1. The purpose of this plan is to prescribe procedures to be followed in the event of an emergency associated with the ***Dam Name***, which is caused by an unusually large flood or earthquake, a malfunction (hydraulic or structural) of the spillway, malicious human activity such as sabotage, vandalism or terrorism, or failure of the dam.
2. This EAP defines responsibilities and procedures to:

* Identify unusual and unlikely conditions that may endanger the dam.
* Initiate remedial actions to prevent dam failure or minimize the downstream impacts of a dam failure.
* Initiate emergency actions to warn downstream residents of impending or actual failure of the dam.

# Step 1: Event Detection and Level Determination

### 1.1 Event Detection

Daily surveillance, observation, and/or instrumentation readings at the site are the normal methods of detecting potential emergency situations. Unusual or emergency events may be detected by:

• Observations at or near the dam.

• Evaluation of instrumentation data.

• Earthquakes felt or reported in the vicinity of the dam.

• Forewarning of conditions that may cause an unusual event or emergency event at the dam (for example, severe weather or flash flood forecast).

### 1.2 Emergency Level Definitions

#### Event Level 1, RED - Urgent!! Dam failure imminent or is in progress.

This is an extremely urgent situation when a dam failure is occurring or is about to occur and cannot be prevented. When it is determined that no time is available to implement corrective measures to prevent failure, an order for the evacuation of residents in potential inundation areas shall be issued by the ***Incident Commander***.

#### Event Level 2, YELLOW - Potential dam failure situation, rapidly developing.

This classification indicates that a situation is developing that could lead to dam failure, but there is not an immediate threat of dam failure. The ***Dam Owner/Operator*** should closely monitor the condition of the dam and periodically report the status of the situation. A reasonable amount of time is available for analysis before deciding on the evacuation of residents. If the dam condition worsens and failure becomes imminent, the ***Incident Commander*** must be notified immediately of the change in the emergency level to evacuate the people at risk downstream.

If time permits, the ***Dam Owner’s Engineer (if applicable)*** and ***NC Dam Safety*** officials should be contacted to evaluate the situation and recommend remedial actions to prevent failure of the dam. The ***Dam Owner/Operator*** should initiate remedial repairs utilizing Appendix C. The time available to employ remedial actions may be in the scope of hours or days.

#### Event Level 3, GREEN - Unusual event, slowly developing.

This classification indicates a situation is developing but has not yet threatened the operation or structural integrity of the dam. The ***Dam Owner’s Engineer (if applicable)*** and ***NC Dam Safety*** should be contacted to investigate the situation and recommend actions to take. The condition of the dam should be closely monitored, especially during storm events, to detect any development of a potential or imminent dam failure situation.

See the following pages for guidance in determining the proper emergency level for various situations.

### Table 1.3 – Event Level Determination Guidance and Action Data Sheet Index

|  |  |  |  |
| --- | --- | --- | --- |
| **Event** | **Condition** | **Emergency Level** | **Action Data Sheet** |
| **Unexpected Failure** | Dam unexpectedly and without warning begins to fail | 1 | #1 |
| **Earth Spillway Flow** | Reservoir water surface elevation at spillway crest or spillway is flowing with no active erosion | 3 | A3 |
| Spillway flowing with active gully erosion or flow that could result in flooding of people downstream if the reservoir level continues to rise | 2 | A2 |
| Spillway flowing with an advancing head cut that is threatening the control section or that is already flooding people downstream | 1 | A1 |
| **Embankment Overtopping** | Reservoir level is 1 foot below the top of the dam | 2 | B2 |
| Water from the reservoir is flowing over the top of the dam | 1 | B1 |
| **Seepage** | New seepage areas in or near the dam, water flowing clear | 3 | C3 |
| New seepage areas with cloudy discharge or increasing flow rate | 2 | C2 |
| Seepage with discharge greater than 10 gallons per minute | 1 | C1 |
| **Sinkholes** | Observation of new sinkhole in reservoir area or on embankment | 2 | D2 |
| Rapidly enlarging sinkhole or new sinkholes forming | 1 | D1 |
| **Embankment Cracking** | New cracks in the embankment greater than ¼-inch wide without seepage | 3 | E3 |
| **Embankment Movement** | Visual movement/slippage of the embankment slope | 2 | F2 |
| Sudden or rapidly proceeding slides of the embankment slopes | 1 | F1 |
| **Instruments** | Instrumentation readings beyond predetermined values | 3 | G3 |
| **Earthquake** | Measurable earthquake felt or reported near the dam and the dam appears to be stable | 3 | H3 |
| Earthquake resulting in visible damage to the dam or appurtenances | 1 | H1 |
| **Security Threat** | Reported, unverified bomb threat | 3 | I3 |
| Verified bomb threat that, if carried out, could result in damage to the dam or appurtenances with no impacts to the functioning of the dam | 2 | I2 |
| A detonated bomb that has resulted in damage to the dam or appurtenances | 1 | I1 |
| **Sabotage/ Vandalism** | Damage to or modification to the dam or appurtenances with no impacts to the functioning of the dam | 3 | J3 |
| Damage to dam or appurtenances that has resulted in seepage flow | 2 | J2 |
| Damage to dam or appurtenances that has resulted in uncontrolled water release | 1 | J1 |
| **Blocked Culvert/**  **Spillway** | Debris is blocking a spillway pipe, causing lake level to rise | 3 | K3 |
| **Spillways/**  **Structural** | New minor spillway cracking, spalling, or damage to the spillway gate so that it is unable to be closed | 3 | L3 |
| New spillway cracking or spalling resulting from structure distress or gates become inoperable | 2 | L2 |
| Mass movement of the concrete structure | 1 | L1 |

1. If an event is not listed, **adapt an Action Data Sheet** **to a similar type of event and event level**.
2. If resources described in the Action Data Sheets are not available, **adapt available resources**.
3. If an event is not relevant to the dam, **clearly indicate the event is “NOT APPLICABLE” on the respective action data sheet**.
4. After the ***Dam Owner/Operator*** and/or ***EAP Coordinator*** has determined the event level:

* See Step 2: GREEN, YELLOW & RED notification flowcharts.
* See Step 3: Action Data Sheets for specific actions per event level.

# Step 2: Notifications and Communication

### Emergency Level 3, Greem Notifications

### Notification Flowchart, Event Level 3, GREEN

UNUSUAL EVENT, SLOWLY DEVELOPING

(Can usually wait until regular business hours unless Event Level is elevated)

### Emergency Level 2, Yellow Notifications

**PERTINENT INFORMATION TO COMMUNICATE:**

* ***Your Name***
* ***Your Location***
* ***Your Phone Number***
* ***Dam Name*** and ***Dam Address***
* Flooding along the ***River/Creek Name*** is possible
* ***List of Personnel On-Site*** and ***Phone Numbers***
* ***Reason for EAP Activation and Event Level***

**NC Dam Safety**

**BUSINESS HOURS**

***Regional Office Engineer***

Regional Office

Phone Number (Office)

Raleigh Central Office

(919) 707-9220 (Office)

**Dam Owner’s Engineer (Select as Appropriate)**

***Name***

Phone Number (Office)

Phone Number (Cell/24-Hour Emergency)

Or:

No Engineer at Time of EAP Preparation

**Notes:**

(1), (2) denotes suggested call sequence.

See Emergency Services Contacts (Appendix B) for additional contacts and other emergency personnel.

(1)

(1)

(2)

State 24-Hour

Emergency Watch

**1 (800) 858-0368**

**Dam Owner/Operator**

***Name***

Phone Number (Office)

Phone Number (Cell/24-Hour Emergency)

**Figure 2.1**

**EVENT**

**LEVEL**

**3**

**GREEN**

### Notification Flowchart, Event Level 2, YELLOW

POTENTIAL DAM FAILURE SITUATION, RAPIDLY DEVELOPING

**Notes:**

(1), (2) denotes suggested call sequence.

See Emergency Services Contacts (Appendix B) for additional contacts and other emergency personnel.

**PERTINENT INFORMATION TO COMMUNICATE:**

* ***Your Name***
* ***Your Location***
* ***Your Phone Number***
* ***Dam Name*** and ***Dam Address***
* Flooding along the ***River/Creek Name*** is possible
* ***List of Personnel On-Site*** and ***Phone Numbers***
* ***Reason for EAP Activation and Event Level***

**NC Dam Safety**

**BUSINESS HOURS**

***Regional Office Engineer***

Regional Office

Phone Number (Office)

Raleigh Central Office

(919) 707-9220 (Office)

**Dam Owner’s Engineer (Select as Appropriate)**

***Name***

Phone Number (Office)

Phone Number (Cell/24-Hour Emergency)

Or:

No Engineer at Time of EAP Preparation

**Dam Owner/Operator**

***Name***

Phone Number (Office)

Phone Number (Cell/24-Hour Emergency)

(1)

(1)

(3)

(2)

**County or Local First Responders**

**911 Dispatch**

**Figure 2.2**

(1)

State 24-Hour

Emergency Watch

**1 (800) 858-0368**

**EVENT**

**LEVEL**

**2**

**YELLOW**

### Emergency Level 1, Red Notifications

### Notification Flowchart, Event Level 1, RED

URGENT!! DAM FAILURE IMMINENT OR IS IN PROGRESS

**PERTINENT INFORMATION TO COMMUNICATE:**

* The ***Dam Name*** is failing. The downstream area must be evacuated immediately. I repeat, the ***Dam Name*** is failing.
* ***Your Name***
* ***Your Location***
* ***Your Phone Number***
* ***Dam Name*** and ***Dam Address***
* ***List of Personnel On-Site*** and ***Phone Numbers***
* ***Reason for EAP Activation and Event Level***

(2)

**NC Dam Safety**

**BUSINESS HOURS**

***Name of******Regional Office Engineer***

Regional Office

Phone Number (Office)

Raleigh Central Office

(919) 707-9220 (Office)

**Dam Owner’s Engineer (Select as Appropriate)**

***Name***

Phone Number (Office)

Phone Number (Cell/24-Hour Emergency)

Or:

No Engineer at Time of EAP Preparation

State 24-Hour

Emergency Watch

**1 (800) 858-0368**

(3)

(1)

**Dam Owner/Operator**

***Name***

Phone Number (Office)

Phone Number (Cell/24-Hour Emergency)

(1)

**County or Local First Responders**

**911 Dispatch**

(1)

**Notes:**

(1), (2) denotes suggested call sequence.

See Emergency Services Contacts (Appendix B) for additional contacts and other emergency personnel.

**EVENT**

**LEVEL**

**1**

**RED**

**Figure 2.3**

# Step 3: Expected Actions

3.1 Action Data Sheets

1. The Action Data Sheets are to be used as guidance during an emergency event. If an event is not included in Table 1.3, it is recommended to adopt an Action Data Sheet from a similar event and event level. Table 1.3 depicts the Action Data Sheet Index to be used according to the event level. The Action Data Sheet should be reviewed by the *Dam Owner’s Engineer (if applicable)* when possible and time permits.
2. If the *Incident Commander* is not located on the dam, then it is recommended that two people split the following responsibilities:
3. One person at the dam to handle on site actions.
4. One person who can make the notifications.

## Level 1, Red – Unexpected Failure

|  |  |  |  |
| --- | --- | --- | --- |
| **LEV**EL: **1, RED – UNEXPECTED FAILURE**  Defined as: “Dam unexpectedly and without warning begins to fail” | | | **Sheet**  **#1** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 1 notifications on Figure 2.3 have been made. 2. Recommend to the ***Incident Commander*** **IMMEDIATE EVACUATION** downstream of the dam. 3. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public. 4. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2).   ***Dam Owner’s Engineer (if applicable)***   1. Provide decision support and technical support to ***Dam Owner/Operator*** and ***EAP Coordinator*** as appropriate. 2. Advise ***Dam Owner/Operator*** and ***EAP Coordinator*** of dangerous conditions at the dam.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions CONTINUOUSLY. Using Table 1.3, determine if:   1. The event remains at the current Event Level 1 (No change in situation). 2. Event may be Terminated only when either:  * There is no longer a threat of dam failure with no additional rainfall occurring AND it has been determined by ***NC Dam Safety*** staff to safely impound water or; * The dam has failed AND there is no longer a threat to the downstream public as determined by ***NC Dam Safety*** staff.   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| 1. **EVENT LEVEL 1**   **(NO CHANGE)** | **B) TERMINATION** |  | |
| Continue recommended actions on this sheet | Go to **Termination and After-Action Review** (Step 4) |  | |

## Level 3, Green – Earth Spillway Flow

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 3, GREEN – EARTH SPILLWAY FLOW**  Defined as: “Reservoir water surface elevation at spillway crest or spillway is flowing with no active erosion” | | | **Sheet**  **A3** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 3 notifications on Figure 2.1 have been made. 2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. Monitor water levels and spillway area for erosion at least daily. 3. Monitor off-site areas to include instrumentation (Applicable to all Action Data Sheets with reference to Instrumentation). 4. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2). 5. Contact the ***Dam Owner’s Engineer (if applicable)*** at least daily to report the latest observations and conditions. If conditions change significantly, go to the **re-evaluation/decision section** and follow relevant steps immediately.   ***Dam Owner’s Engineer (if applicable)***  Review all pertinent information to recommend appropriate actions to the ***EAP Coordinator*** in conjunction with ***NC Dam Safety***.  Provide oversight to corrective actions or work as required.  Observe conditions on site periodically and provide decision support as appropriate.  ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** and ***Dam Owner/Operator*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions at least daily or when conditions change significantly. Using Table 1.3, determine if:   1. The event can be terminated when spillway flows cease. 2. The event remains at the current Event Level 3 (No change in situation). 3. The event warrants escalation to Event Level 2 if spillway flows with active gully erosion or flow that could result in flooding downstream or Event Level 1 if spillway flows with an advancing head cut that is threatening the control section or that is already flooding people downstream.   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) TERMINATION** | **B) EVENT LEVEL 3 (NO CHANGE)** | **C) EVENT LEVEL ESCALATION** | |
| Go to **Termination and After-Action Review** (Step 4) | Continue recommended actions on this sheet | Go to **Event Level 2 or Event Level 1 Steps 2 & 3** | |

## Level 2, Yellow – Earth Spillway Flow

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 2, YELLOW – EARTH SPILLWAY FLOW**  Defined as: “Spillway flowing with active gully erosion or flow that could result in flooding of people downstream if the reservoir level continues to rise” | | | **Sheet**  **A2** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 2 notifications on Figure 2.2 have been made. 2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. Stay clear of water flows as they are very dangerous. Monitor water levels and spillway area for erosion every 2 hours for changes. 3. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2). 4. Monitor off-site areas to include instrumentation (Applicable to all Action Data Sheets with reference to Instrumentation). 5. Use a bottom drain, installed siphon, or pumps on site to provide additional drawdown of the lake level. Caution must be taken to not add additional flooding to properties downstream. 6. Contact the ***Dam Owner’s Engineer (if applicable)*** at least twice daily to report the latest observations and conditions. If conditions change significantly, go to the **re-evaluation/decision section** and follow relevant steps immediately.   ***Dam Owner’s Engineer (if applicable)***   1. Review all pertinent information to recommend appropriate actions to the ***EAP Coordinator*** in conjunction with ***NC Dam Safety***. 2. Provide oversight to corrective actions or work as required. 3. Observe conditions on site periodically and provide decision support as appropriate.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions at least twice daily or when conditions change significantly. Using Table 1.3, determine if:   1. The event warrants downgrade to Event Level 3 if spillway flows are decreasing with no additional rainfall occurring.Notify all contacts on Event Level 2 Notification Flowchart that the Event Level will be downgraded to Event Level 3. 2. The event remains at the current Event Level 2 (No change in situation). 3. The event warrants escalation to Event Level 1 if spillway flows with an advancing head cut that is threatening the control section or that is already flooding people downstream.   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| 1. **EVENT LEVEL DOWNGRADE** | 1. **EVENT LEVEL 2**   **(NO CHANGE)** | 1. **EVENT LEVEL**   **ESCALATION** | |
| Go to **Event Level 3 Steps 2 & 3** | Continue recommended actions on this sheet | Go to **Event Level 1**  **Steps 2 & 3** | |

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 1, RED – EARTH SPILLWAY FLOW**  Defined as: “Spillway flowing with an advancing head cut that is threatening the control section or that is already flooding people downstream” | | | **Sheet**  **A1** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 1 notifications on Figure 2.3 have been made. 2. Recommend to the ***Incident Commander*** **IMMEDIATE EVACUATION** downstream of the dam. 3. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public. 4. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2).   ***Dam Owner’s Engineer (if applicable)***   1. Provide decision support and technical support to ***Dam Owner/Operator*** and ***EAP Coordinator*** as appropriate. 2. Advise ***Dam Owner/Operator*** and ***EAP Coordinator*** of dangerous conditions at the dam.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions CONTINUOUSLY. Using Table 1.3, determine if:   1. The event warrants downgrade to Event Level 2 or Event Level 3 if spillway flows have stopped with no additional rainfall occurring YET there is damage to the dam that prevents safe impoundment of water. All contacts on Event Level 1 Notification Flowchart shall be notified of a downgrade to Event Level 2 or Event Level 3. 2. The event remains at the current Event Level 1 (No change in situation). 3. Event may be Terminated only when either:  * Spillway flows have stopped with no additional rainfall occurring AND it has been determined by ***NC Dam Safety*** staff to safely impound water or; * The dam has failed AND there is no longer a threat to the downstream public as determined by ***NC Dam Safety*** staff.   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| 1. **EVENT LEVEL DOWNGRADE** | 1. **EVENT LEVEL 1**   **(NO CHANGE)** | **C) TERMINATION** | |
| Go to **Event Level 2 or Event Level 3 Steps 2 & 3** | Continue recommended actions on this sheet | Go to **Termination and After-Action Review** (Step 4) | |

## Level 1, Red – Earth Spillway Flow

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 2, YELLOW – EMBANKMENT OVERTOPPING**  Defined as: “Reservoir is 1 foot below the top of the dam” | | | **Sheet**  **B2** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 2 notifications on Figure 2.2 have been made. 2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. Stay clear of water flows as they are very dangerous. Monitor water levels and spillway area for erosion every 2 hours for changes. 3. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2). 4. Monitor off-site areas to include instrumentation (Applicable to all Action Data Sheets with reference to Instrumentation). 5. Use a bottom drain, installed siphon, or pumps on site to provide additional drawdown of the lake level. Caution must be taken to not add additional flooding to properties downstream. 6. Contact the ***Dam Owner’s Engineer (if applicable)*** at least twice daily to report the latest observations and conditions. If conditions change significantly, go to the **re-evaluation/decision section** and follow relevant steps immediately.   ***Dam Owner’s Engineer (if applicable)***   1. Review all pertinent information to recommend appropriate actions to the ***EAP Coordinator*** in conjunction with ***NC Dam Safety***. 2. Provide oversight to corrective actions or work as required. 3. Observe conditions on site periodically and provide decision support as appropriate.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions at least twice daily or when conditions change significantly. Using Table 1.3, determine if:   1. The event can be terminated when the reservoir level is more than 1 foot below the top of the dam. 2. The event remains at the current Event Level 2 (No change in situation). 3. The event warrants escalation to Event Level 1 if water begins to overtop the embankment.   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) TERMINATION** | **B) EVENT LEVEL 2**  **(NO CHANGE)** | **C) EVENT LEVEL ESCALATION** | |
| Go to **Termination and After-Action Review** (Step 4) | Continue recommended actions on this sheet | Go to **Event Level 1**  **Steps 2 & 3** | |

## Level 2, Yellow – Embankment Overtopping

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 1, RED – EMBANKMENT OVERTOPPING**  Defined as: “Water from the reservoir is flowing over the top of the dam” | | | **Sheet**  **B1** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 1 notifications on Figure 2.3 have been made. 2. Recommend to the ***Incident Commander*** **IMMEDIATE EVACUATION** downstream of the dam. 3. Well-vegetated embankment dams can withstand overtopping for a short amount of time. Monitor for changes in water flow as signs of the embankment eroding. 4. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public. 5. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2).   ***Dam Owner’s Engineer (if applicable)***   1. Provide decision support and technical support to ***Dam Owner/Operator*** and ***EAP Coordinator*** as appropriate. 2. Advise ***Dam Owner/Operator*** and ***EAP Coordinator*** of dangerous conditions at the dam.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions CONTINUOUSLY. Using Table 1.3, determine if:   1. The event warrants downgrade to Event Level 2 if spillway flows have stopped with no additional rainfall occurring YET there is damage to the dam that prevents safe impoundment of water. All contacts on Event Level 1 Notification Flowchart shall be notified of a downgrade to Event Level 2. 2. The event remains at the current Event Level 1 (No change in situation). 3. Event may be Terminated only when either:  * Spillway flows have stopped with no additional rainfall occurring AND it has been determined by ***NC Dam Safety*** staff to safely impound water or; * The dam has failed AND there is no longer a threat to the downstream public as determined by ***NC Dam Safety*** staff.   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) EVENT LEVEL DOWNGRADE** | **B) EVENT LEVEL 1**  **(NO CHANGE)** | **C) TERMINATION** | |
| Go to **Event Level 2**  **Steps 2 & 3** | Continue recommended actions on this sheet | Go to **Termination and After-Action Review** (Step 4) | |

## Level 1, Red – Embankment Overtopping

## Level 3, Green – Seepage

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 3, GREEN – SEEPAGE**  Defined as: “New seepage areas in or near the dam, water flowing clear” | | | **Sheet**  **C3** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 3 notifications on Figure 2.1 have been made. 2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks.** Monitor water levels and seepage points for cloudy discharge or increased flow rates at least daily. 3. If conditions permit:  * If the inflow source of the seepage is within the reservoir, plug the flow with available material – hay bales, bentonite, or plastic sheeting. * Place an inverted filter (layered sand and gravel) over the exit area to hold soil material in place. * Use a bottom drain, installed siphon, or pumps on site to provide additional drawdown of the lake level. Caution must be taken to not add additional flooding to properties downstream.  1. Monitor off-site areas to include instrumentation (Applicable to all Action Data Sheets with reference to Instrumentation). 2. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2). 3. Contact the ***Dam Owner’s Engineer (if applicable)*** at least daily to report the latest observations and conditions. If conditions change significantly, go to the **re-evaluation/decision section** and follow relevant steps immediately.   ***Dam Owner’s Engineer (if applicable)***   1. Review all pertinent information to recommend appropriate actions to the ***EAP Coordinator*** in conjunction with ***NC Dam Safety***. 2. Provide oversight to corrective actions or work as required. 3. Observe conditions on site periodically and provide decision support as appropriate.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** and ***Dam Owner/Operator*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions at least daily or when conditions change significantly. Using Table 1.3, determine if:   1. The event can be terminated when seepage flow has been remedied AND it has been determined by ***NC Dam Safety*** staff to safely impound water. 2. The event remains at the current Event Level 3 (No change in situation). 3. The event warrants escalation to Event Level 2 if new seepage occurs with cloudy discharge or increasing flow rate or Event Level 1 if seepage occurs with discharge greater than 10 gallons per minute.   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) TERMINATION** | **B) EVENT LEVEL 3 (NO CHANGE)** | **C) EVENT LEVEL ESCALATION** | |
| Go to **Termination and After-Action Review** (Step 4) | Continue recommended actions on this sheet | Go to **Event Level 2 or Event Level 1 Steps 2 & 3** | |

## Level 2, Yellow – Seepage

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 2, YELLOW – SEEPAGE**  Defined as: “New seepage areas with cloudy discharge or increasing flow rate” | | | **Sheet**  **C2** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 2 notifications on Figure 2.2 have been made. 2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. Monitor water levels and seepage points for cloudy discharge or increased flow rates every 2 hours for changes. 3. If conditions permit:  * If the inflow source of the seepage is within the reservoir, plug the flow with available material – hay bales, bentonite, or plastic sheeting. * Place an inverted filter (layered sand and gravel) over the exit area to hold soil material in place. * Use a bottom drain, installed siphon, or pumps on site to provide additional drawdown of the lake level. Caution must be taken to not add additional flooding to properties downstream.  1. Monitor off-site areas to include instrumentation (Applicable to all Action Data Sheets with reference to Instrumentation). 2. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2). 3. Contact the ***Dam Owner’s Engineer (if applicable)*** at least twice daily to report the latest observations and conditions. If conditions change significantly, go to the **re-evaluation/decision section** and follow relevant steps immediately.   ***Dam Owner’s Engineer (if applicable)***   1. Review all pertinent information to recommend appropriate actions to the ***EAP Coordinator*** in conjunction with ***NC Dam Safety***. 2. Provide oversight to corrective actions or work as required. 3. Observe conditions on site periodically and provide decision support as appropriate.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions at least twice daily or when conditions change significantly. Using Table 1.3, determine if:   1. The event warrants downgrade to Event Level 3 if the water level in the lake is lowered below the level of seepage. Notify all contacts on Event Level 2 Notification Flowchart that the Event Level will be downgraded to Event Level 3. 2. The event remains at the current Event Level 2 (No change in condition). 3. The event warrants escalation to Event Level 1 if seepage occurs with discharge greater than 10 gallons per minute.   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) EVENT LEVEL DOWNGRADE** | **B) EVENT LEVEL 2 (NO CHANGE)** | **C) EVENT LEVEL ESCALATION** | |
| Go to **Event Level 3 Steps 2 & 3** | Continue recommended actions on this sheet | Go to **Event Level 1**  **Steps 2 & 3** | |

## Level 1, Red – Seepage

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 1, RED – SEEPAGE**  Defined as: “Seepage with discharge greater than 10 gallons per minute” | | | **Sheet**  **C1** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 1 notifications on Figure 2.3 have been made. 2. Recommend to the ***Incident Commander*** **IMMEDIATE EVACUATION** downstream of the dam. 3. Well-vegetated embankment dams can withstand overtopping for a short amount of time. Monitor for changes in water flow as signs of the embankment eroding. 4. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public. 5. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2).   ***Dam Owner’s Engineer (if applicable)***  Provide decision support and technical support to ***Dam Owner/Operator*** and ***EAP Coordinator*** as appropriate.  Advise ***Dam Owner/Operator*** and ***EAP Coordinator*** of dangerous conditions at the dam.  ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions CONTINUOUSLY. Using Table 1.3, determine if:   1. The event warrants downgrade to Event Level 2 or Event Level 3 if seepage stops AND the water level the in the lake is lowered below the level of seepage YET there is damage to the dam that prevents safe impoundment of water. All contacts on Event Level 1 Notification Flowchart shall be notified of a downgrade to Event Level 2 or Event Level 3. 2. The event remains at the current Event Level 1 (No change in situation). 3. Event may be Terminated only when either:  * Seepage flows have stopped AND it has been determined by ***NC Dam Safety*** staff to safely impound water or; * The dam has failed AND there is no longer a threat to the downstream public as determined by ***NC Dam Safety*** staff.   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) EVENT LEVEL DOWNGRADE** | **B) EVENT LEVEL 1**  **(NO CHANGE)** | **C) TERMINATION** | |
| Go to **Event Level 2 or Event Level 3 Steps 2 & 3** | Continue recommended actions on this sheet | Go to **Termination and After-Action Review** (Step 4) | |

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 2, YELLOW – SINKHOLES**  Defined as: “Observation of new sinkhole in reservoir area or on embankment” | | | **Sheet**  **D2** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 2 notifications on Figure 2.2 have been made. 2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. Monitor water levels and change in diameter or depth of sinkhole every 2 hours for changes. 3. If conditions permit:    * If the inflow source of the seepage is within the reservoir, plug the flow with available material – hay bales, bentonite, or plastic sheeting.    * Place an inverted filter (layered sand and gravel) over exit area of soil loss to hold soil material in place.    * Use a bottom drain, installed siphon, or pumps on site to provide additional drawdown of the lake level until below the bottom of a sinkhole. Caution must be taken to not add additional flooding to properties downstream. 4. Monitor off-site areas to include instrumentation (Applicable to all Action Data Sheets with reference to Instrumentation). 5. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2). 6. Contact the ***Dam Owner’s Engineer (if applicable)*** at least twice daily to report the latest observations and conditions. If conditions change significantly, go to the **re-evaluation/decision section** and follow relevant steps immediately.   ***Dam Owner’s Engineer (if applicable)***   1. Review all pertinent information to recommend appropriate actions to the ***EAP Coordinator*** in conjunction with ***NC Dam Safety***. 2. Provide oversight to corrective actions or work as required. 3. Observe conditions on site periodically and provide decision support as appropriate.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions at least twice daily or when conditions change significantly. Using Table 1.3, determine if:   1. The event can be terminated when the reservoir level is lowered below the bottom level of sinkhole. 2. The event remains at the current Event Level 2 (No change in condition). 3. The event warrants escalation to Event Level 1 if the sinkhole rapidly enlarges or new sinkholes form.   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) TERMINATION** | **B) EVENT LEVEL 2 (NO CHANGE)** | **C) EVENT LEVEL ESCALATION** | |
| Go to **Termination and After-Action Review** (Step 4) | Continue recommended actions on this sheet | Go to **Event Level 1**  **Steps 2 & 3** | |

## Level 2, Yellow - Sinkholes

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 1, RED – SINKHOLES**  Defined as: “Rapidly enlarging sinkhole or new sinkholes forming” | | | **Sheet**  **D1** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 1 notifications on Figure 2.3 have been made. 2. Recommend to the ***Incident Commander*** **IMMEDIATE EVACUATION** downstream of the dam. 3. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public. 4. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2).   ***Dam Owner’s Engineer (if applicable)***   1. Provide decision support and technical support to ***Dam Owner/Operator*** and ***EAP Coordinator*** as appropriate. 2. Advise ***Dam Owner/Operator*** and ***EAP Coordinator*** of dangerous conditions at the dam.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions CONTINUOUSLY. Using Table 1.3, determine if:   1. The event warrants downgrade to Event Level 2 if there is no longer an immediate threat of dam failure AND the water level in the lake is lowered below the bottom level of sinkhole YET there is damage to the dam that prevents safe impoundment of water. All contacts on Event Level 1 Notification Flowchart shall be notified of a downgrade to Event Level 2. 2. The event remains at the current Event Level 1 (No change in situation). 3. Event may be Terminated only when either:  * There is no longer a threat of dam failure AND it has been determined by ***NC Dam Safety*** staff to safely impound water or; * The dam has failed AND there is no longer a threat to the downstream public as determined by ***NC Dam Safety*** staff.   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) EVENT LEVEL DOWNGRADE** | **B) EVENT LEVEL 1**  **(NO CHANGE)** | **C) TERMINATION** | |
| Go to **Event Level 2**  **Steps 2 & 3** | Continue recommended actions on this sheet | Go to **Termination and After-Action Review** (Step 4) | |

## Level 1, Red - Sinkholes

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 3, GREEN – EMBANKMENT CRACKING**  Defined as: “New cracks in the embankment greater than ¼-inch wide without seepage” | | | **Sheet**  **E3** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 3 notifications on Figure 2.1 have been made. 2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. Monitor water levels and crack widths for movement or seepage at least daily. 3. Use a bottom drain, installed siphon, or pumps on site to provide additional drawdown of the lake level to relieve pressure on the embankment. Caution must be taken to not add additional flooding to properties downstream. 4. Monitor off-site areas to include instrumentation (Applicable to all Action Data Sheets with reference to Instrumentation). 5. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2). 6. Contact the ***Dam Owner’s Engineer (if applicable)*** at least daily to report the latest observations and conditions. If conditions change significantly, go to the **re-evaluation/decision section** and follow relevant steps immediately.   ***Dam Owner’s Engineer (if applicable)***   1. Review all pertinent information to recommend appropriate actions to the ***EAP Coordinator*** in conjunction with ***NC Dam Safety***. 2. Provide oversight to corrective actions or work as required. 3. Observe conditions on site periodically and provide decision support as appropriate.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** and ***Dam Owner/Operator*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions at least daily or when conditions change significantly. Using Table 1.3, determine if:   1. The event can be terminated when embankment cracking has been remedied AND it has been determined by ***NC Dam Safety*** staff to safely impound water. 2. The event remains at the current Event Level 3 (No change in situation).   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) TERMINATION** | **B) EVENT LEVEL 3 (NO CHANGE)** |  | |
| Go to **Termination and After-Action Review** (Step 4) | Continue recommended actions on this sheet |  | |

## Level 3, Green – Embankment Cracking

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 2, YELLOW – EMBANKMENT MOVEMENT**  Defined as: “Visual movement/slippage of the embankment slope” | | | **Sheet**  **F2** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP******Coordinator)***   1. Ensure that Event Level 2 notifications on Figure 2.2 have been made. 2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. Monitor water levels and development of new cracks or movements every 2 hours for changes. 3. If conditions permit:  * Use a bottom drain, installed siphon, or pumps on site to provide additional drawdown of the lake level to relieve pressure on the embankment. Caution must be taken to not add additional flooding to properties downstream. * Stabilize slides on the downstream slope by weighting the toe area below the slide with additional soil, rock, or gravel.  1. Monitor off-site areas to include instrumentation (Applicable to all Action Data Sheets with reference to Instrumentation). 2. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2). 3. Contact the ***Dam Owner’s Engineer (if applicable)*** at least twice daily to report the latest observations and conditions. If conditions change significantly, go to the **re-evaluation/decision section** and follow relevant steps immediately.   ***Dam Owner’s Engineer (if applicable)***   1. Review all pertinent information to recommend appropriate actions to the ***EAP Coordinator*** in conjunction with ***NC Dam Safety***. 2. Provide oversight to corrective actions or work as required. 3. Observe conditions on site periodically and provide decision support as appropriate.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions at least twice daily or when conditions change significantly. Using Table 1.3, determine if:   1. The event can be terminated when the reservoir level is lowered below the area of concern AND it has been determined by ***NC Dam Safety*** staff to safely impound water. 2. The event remains at the current Event Level 2 (No change in situation). 3. The event warrants escalation to Event Level 1 if the integrity of the dam appears to be threatened by sudden or rapidly proceeding slides of the embankment slopes.   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) TERMINATION** | **B) EVENT LEVEL 2 (NO CHANGE)** | **C) EVENT LEVEL ESCALATION** | |
| Go to **Termination and After-Action Review**  (Step 4) | Continue recommended actions on this sheet | Go to **Event Level 1**  **Steps 2 & 3** | |

## Level 2 Yellow – Embankment Movement

## Level 1, Red – Embankment Movement

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 1, RED – EMBANKMENT MOVEMENT**  Defined as: “Sudden or rapidly proceeding slides of the embankment slopes” | | | **Sheet**  **F1** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 1 notifications on Figure 2.3 have been made. 2. Recommend to the ***Incident Commander*** **IMMEDIATE EVACUATION** downstream of the dam. 3. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public. 4. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2).   ***Dam Owner’s Engineer (if applicable)***   1. Provide decision support and technical support to ***Dam Owner/Operator*** and ***EAP Coordinator*** as appropriate. 2. Advise ***Dam Owner/Operator*** and ***EAP Coordinator*** of dangerous conditions at the dam.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions CONTINUOUSLY. Using Table 1.3, determine if:   1. The event warrants downgrade to Event Level 2 if there is no longer an immediate threat of dam failure AND the water level in the lake is lowered below the bottom level of embankment fill YET there is damage to the dam that prevents safe impoundment of water. All contacts on Event Level 1 Notification Flowchart shall be notified of a downgrade to Event Level 2. 2. The event remains at the current Event Level 1 (No change in situation). 3. Event may be Terminated only when either:  * There is no longer a threat of dam failure AND it has been determined by ***NC Dam Safety*** staff to safely impound water or; * The dam has failed AND there is no longer a threat to the downstream public as determined by ***NC Dam Safety*** staff.   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) EVENT LEVEL DOWNGRADE** | **B) EVENT LEVEL 1**  **(NO CHANGE)** | **C) TERMINATION** | |
| Go to **Event Level 2**  **Steps 2 & 3** | Continue recommended actions on this sheet | Go to **Termination and After-Action Review** (Step 4) | |

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 3, GREEN – INSTRUMENTS**  Defined as: “Instrumentation readings beyond predetermined values” | | | **Sheet**  **G3** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 3 notifications on Figure 2.1 have been made. 2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. Monitor water levels and instrument readings for changes or anomalies at least daily. 3. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2). 4. Contact the ***Dam Owner’s Engineer (if applicable)*** at least daily to report the latest observations and conditions. If instrumentation readings at the dam are determined to indicate a potentially dangerous situation, go to the **re-evaluation/decision section** and follow relevant steps immediately.   ***Dam Owner’s Engineer (if applicable)***   1. Review all pertinent information to recommend appropriate actions to the ***EAP Coordinator*** in conjunction with ***NC Dam Safety***. 2. Provide oversight to corrective actions or work as required. 3. Observe conditions on site periodically and provide decision support as appropriate.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** and ***Dam Owner/Operator*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions at least daily or when conditions change significantly. Using Table 1.3, determine if:   1. The event can be terminated when instrumentation readings return to normal or if the instrument reading is determined to be invalid. 2. The event remains at the current Event Level 3 (No change in situation).   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) TERMINATION** | **B) EVENT LEVEL 3**  **(NO CHANGE)** |  | |
| Go to **Termination and After-Action Review** (Step 4) | Continue recommended actions on this sheet |  | |

## Level 3, Green - Instruments

## Level 3, Green – Earthquake

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 3, GREEN – EARTHQUAKE**  Defined as: “Measurable earthquake felt or reported near the dam and the dam appears to be stable” | | | **Sheet**  **H3** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 3 notifications on Figure 2.1 have been made. 2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. 3. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2). 4. Be prepared for additional aftershocks. 5. Contact the ***Dam Owner’s Engineer (if applicable)*** to report the latest observations and conditions. 6. If an inspection has determined a potentially dangerous situation, go to the **re-evaluation/decision section** and follow relevant steps immediately.   ***Dam Owner’s Engineer (if applicable)***   1. Review all pertinent information to recommend appropriate actions to the ***EAP Coordinator*** in conjunction with ***NC Dam Safety***. 2. Provide oversight to corrective actions or work as required. 3. Observe conditions on site periodically and provide decision support as appropriate.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** and ***Dam Owner/Operator*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions at least daily or when conditions change significantly. Using Table 1.3, determine if:   1. The event can be terminated when the dam has been determined to be stable and a sufficient amount of time has passed when additional aftershocks are not expected. 2. The event remains at the current Event Level 3 (Until a complete inspection by the ***Dam Owner’s Engineer (if applicable)*** and/or ***NC Dam Safety*** has determined the dam to be stable). 3. The event warrants escalation to Event Level 1 if an inspection has determined the earthquake has resulted in visible damage to the dam or appurtenances.   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) TERMINATION** | **B) EVENT LEVEL 3 (NO CHANGE)** | **C) EVENT LEVEL ESCALATION** | |
| Go to **Termination and After-Action Review** (Step 4) | Continue recommended actions on this sheet | Go to **Event Level 1**  **Steps 2 & 3** | |

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 1, RED – EARTHQUAKE**  Defined as: “Earthquake resulting in visible damage to the dam or appurtenances” | | | **Sheet**  **H1** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 1 notifications on Figure 2.3 have been made. 2. Recommend to the ***Incident Commander*** **IMMEDIATE EVACUATION** downstream of the dam. 3. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public. 4. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2).   ***Dam Owner’s Engineer (if applicable)***   1. Provide decision support and technical support to ***Dam Owner/Operator*** and ***EAP Coordinator*** as appropriate. 2. Advise ***Dam Owner/Operator*** and ***EAP Coordinator*** of dangerous conditions at the dam.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** as appropriate. | | | |
| **RE- EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions CONTINUOUSLY. Using Table 1.3, determine if:   1. The event warrants downgrade to Event Level 3 if there is no longer an immediate threat of dam failure AND water level in the lake is lowered below the bottom level of embankment fill YET there is damage to the dam that prevents safe impoundment of water. All contacts on Event Level 1 Notification Flowchart shall be notified of downgrade to Event Level 3. 2. The event remains at the current Event Level 1 (No change in situation). 3. Event may be Terminated only when either:  * There is no longer a threat of dam failure AND it has been determined by ***NC Dam Safety*** staff to safely impound water or; * The dam has failed AND there is no longer a threat to the downstream public as determined by ***NC Dam Safety*** staff.   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| 1. **EVENT LEVEL**   **DOWNGRADE** | 1. **EVENT LEVEL 1**   **(NO CHANGE)** | C) TERMINATION | |
| Go to **Event Level 3**  **Steps 2 & 3** | Continue recommended actions on this sheet | Go to **Termination and After-Action Review** (Step 4) | |

## Level 1, Red – Earthquake

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 3, GREEN – SECURITY THREAT**  Defined as: “Reported, unverified bomb threat” | | | **Sheet**  **I3** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 3 notifications on Figure 2.1 have been made. 2. Notify Local Law Enforcement to help evaluate the situation. 3. Access the dam only if the area has been cleared by Law Enforcement. 4. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public. 5. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2). 6. If an evaluation by Local Law Enforcement has determined a potentially dangerous situation, go to the **re-evaluation/decision section** and follow relevant steps immediately.   ***Dam Owner’s Engineer (if applicable)***   1. Review all pertinent information to recommend appropriate actions to the ***EAP Coordinator*** in conjunction with ***NC Dam Safety***. 2. Provide oversight to corrective actions or work as required. 3. Observe conditions on site periodically and provide decision support as appropriate.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** and ***Dam Owner/Operator*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions at least daily or when conditions change significantly. Using Table 1.3, determine if:  The event can be terminated when Local Law Enforcement has determined the security threat to be unsubstantiated.  The event remains at the current Event Level 3 (No change in situation).  The event warrants escalation to Event Level 2 if an evaluation has determined a substantiated security threat or Event Level 1 if the security threat has resulted in damage to the dam or appurtenances.  Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) TERMINATION** | **B) EVENT LEVEL 3**  **(NO CHANGE)** | **EVENT LEVEL**  **ESCALATION** | |
| Go to **Termination and After-Action Review** (Step 4) | Continue recommended actions on this sheet | Go to **Event Level 2 or**  **Event Level 1 Steps 2 & 3** | |

## Level 3, Green – Security Threat

## Level 2, Yellow – Security Threat

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 2, YELLOW – SECURITY THREAT**  Defined as: “Verified bomb threat that, if carried out, could result in damage to the dam or appurtenances with no impacts to the functioning of the dam” | | | **Sheet**  **I2** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 2 notifications on Figure 2.2 have been made. 2. Notify Local Law Enforcement to help evaluate the situation. 3. Access the dam only if area has been cleared by Law Enforcement. 4. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public. 5. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2). 6. If an inspection has determined a potentially dangerous situation, go to the **re-evaluation/decision section** and follow relevant steps immediately.   ***Dam Owner’s Engineer (if applicable)***   1. Review all pertinent information to recommend appropriate actions to the ***EAP Coordinator*** in conjunction with ***NC Dam Safety***. 2. Provide oversight to corrective actions or work as required. 3. Observe conditions on site periodically and provide decision support as appropriate.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions at least twice daily or when conditions change significantly. Using Table 1.3, determine if:   1. The event warrants downgrade to Event Level 3 if the security threat is removed YET damage to the dam or appurtenances is in need of repair. Notify all contacts on Event Level 2 Notification Flowchart that the Event Level will be downgraded to Event Level 3. 2. The event remains at the current Event Level 2 (No change in situation). 3. The event warrants escalation to Event Level 1 if the security threat has resulted in damage to the dam or appurtenances.   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) EVENT LEVEL DOWNGRADE** | **B) EVENT LEVEL 2 (NO CHANGE)** | **C) EVENT LEVEL ESCALATION** | |
| Go to **Event Level 3 Steps 2 & 3** | Continue recommended actions on this sheet | Go to **Event Level 1**  **Steps 2 & 3** | |

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 1, RED – SECURITY THREAT**  Defined as: “A detonated bomb that has resulted in damage to the dam or appurtenances” | | | **Sheet**  **I1** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 1 notifications on Figure 2.3 have been made. 2. Recommend to the ***Incident Commander*** **IMMEDIATE EVACUATION** downstream of the dam. 3. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public. 4. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2).   ***Dam Owner’s Engineer (if applicable)***   1. Provide decision support and technical support to ***Dam Owner/Operator*** and ***EAP Coordinator*** as appropriate. 2. Advise ***Dam Owner/Operator*** and ***EAP Coordinator*** of dangerous conditions at the dam.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions CONTINUOUSLY. Using Table 1.3, determine if:   1. The event warrants downgrade to Event Level 2 or Event Level 3 if there is no longer an immediate threat of dam failure AND water level in the lake is lowered below the bottom level of embankment fill YET there is damage to the dam that prevents safe impoundment of water. All contacts on Event Level 1 Notification Flowchart shall be notified of downgrade to Event Level 2 or Event Level 3. 2. The event remains at the current Event Level 1 (No change in situation). 3. Event may be Terminated only when either:  * There is no longer a threat of dam failure AND it has been determined by ***NC Dam Safety*** staff to safely impound water or; * The dam has failed AND there is no longer a threat to the downstream public as determined by ***NC Dam Safety*** staff.   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| 1. **EVENT LEVEL**   **DOWNGRADE** | 1. **EVENT LEVEL 1**   **(NO CHANGE)** | C) TERMINATION | |
| Go to **Event Level 2 or**  **Event Level 3 Steps 2 & 3** | Continue recommended actions on this sheet | Go to **Termination and After-Action Review** (Step 4) | |

## Level 1, Red – Security Threat

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 3, GREEN – SABOTAGE/VANDALISM**  Defined as: “Damage to or modification to the dam or appurtenances with no impacts to the functioning of the dam” | | | **Sheet**  **J3** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 3 notifications on Figure 2.1 have been made. 2. Notify Local Law Enforcement to help evaluate the situation. 3. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. 4. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2). 5. Contact the ***Dam Owner’s Engineer (if applicable)*** to report the latest observations and conditions. 6. If an inspection has determined a potentially dangerous situation, go to the **re-evaluation/decision section** and follow relevant steps immediately.   ***Dam Owner’s Engineer (if applicable)***   1. Review all pertinent information to recommend appropriate actions to the ***EAP Coordinator*** on conjunction with ***NC Dam Safety***. 2. Provide oversight to corrective actions or work as required. 3. Observe conditions on site periodically and provide decision support as appropriate.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** and ***Dam Owner/Operator*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions at least daily or when conditions change significantly. Using Table 1.3, determine if:  The event can be terminated when Local Law Enforcement has determined the sabotage/vandalism to have no impacts to the functioning of the dam.  The event remains at the current Event Level 3 (No change in situation).  The event warrants escalation to Event Level 2 if an evaluation has determined damage to the dam or appurtenances that has resulted in seepage flow or Event Level 1 if an evaluation has determined damage to the dam or appurtenances that has resulted in uncontrolled water release.  Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) TERMINATION** | **B) EVENT LEVEL 3**  **(NO CHANGE)** | **C) EVENT LEVEL**  **ESCALATION** | |
| Go to **Termination and After-Action Review** (Step 4) | Continue recommended actions on this sheet | Go to **Event Level 2 or**  **Event Level 1 Steps 2 & 3** | |

## Level 3, Green – Sabotage/Vandalism

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 2, YELLOW – SABOTAGE/VANDALISM**  Defined as: “Damage to dam or appurtenances that has resulted in seepage flow” | | | **Sheet**  **J2** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 2 notifications on Figure 2.2 have been made. 2. Notify Local Law Enforcement to help evaluate the situation. 3. Access the dam only if area has been cleared by Law Enforcement. 4. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public. 5. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2). 6. If an inspection has determined a potentially dangerous situation, go to the **re-evaluation/decision section** and follow relevant steps immediately.   ***Dam Owner’s Engineer (if applicable)***   1. Review all pertinent information to recommend appropriate actions to the ***EAP Coordinator*** in conjunction with ***NC Dam Safety***. 2. Provide oversight to corrective actions or work as required. 3. Observe conditions on site periodically and provide decision support as appropriate.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions at least twice daily or when conditions change significantly. Using Table 1.3, determine if:   1. The event warrants downgrade to Event Level 3 if the sabotage/vandalism has been remedied YET damage to the dam or appurtenances is in need of repair. Notify all contacts on Event Level 2 Notification Flowchart that the Event Level will be downgraded to Event Level 3. 2. The event remains at the current Event Level 2 (No change in situation). 3. The event warrants escalation to Event Level 1 if an evaluation has determined damage to the dam or appurtenances that has resulted in uncontrolled water release.   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) EVENT LEVEL DOWNGRADE** | **B) EVENT LEVEL 2 (NO CHANGE)** | **C) EVENT LEVEL ESCALATION** | |
| Go to **Event Level 3 Steps 2 & 3** | Continue recommended actions on this sheet | Go to **Event Level 1**  **Steps 2 & 3** | |

## Level 2, Yellow – Sabotage/Vandalism

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 1, RED – SABOTAGE/VANDALISM**  Defined as: “Damage to dam or appurtenances that has resulted in uncontrolled water release” | | | **Sheet**  **J1** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 1 notifications on Figure 2.3 have been made. 2. Recommend to the ***Incident Commander*** **IMMEDIATE EVACUATION** downstream of the dam. 3. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public. 4. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2).   ***Dam Owner’s Engineer (if applicable)***   1. Provide decision support and technical support to ***Dam Owner/Operator*** and ***EAP Coordinator*** as appropriate. 2. Advise ***Dam Owner/Operator*** and ***EAP Coordinator*** of dangerous conditions at the dam.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions CONTINUOUSLY. Using Table 1.3, determine if:   1. The event warrants downgrade to Event Level 2 or Event Level 3 if there is no longer an immediate threat of dam failure AND water level in the lake is lowered below the bottom level of embankment fill YET there is damage to the dam that prevents safe impoundment of water. All contacts on Event Level 1 Notification Flowchart shall be notified of downgrade to Event Level 2 or Event Level 3. 2. The event remains at the current Event Level 1 (No change in situation). 3. Event may be Terminated only when either:  * There is no longer a threat of dam failure AND it has been determined by ***NC Dam Safety*** staff to safely impound water or; * The dam has failed AND there is no longer a threat to the downstream public as determined by ***NC Dam Safety*** staff.   Notify **all** contacts on the Notification Flowchart to advise of the current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| 1. **EVENT LEVEL**   **DOWNGRADE** | 1. **EVENT LEVEL 1**   **(NO CHANGE)** | C) TERMINATION | |
| Go to **Event Level 2 or**  **Event Level 3 Steps 2 & 3** | Continue recommended actions on this sheet | Go to **Termination and After-Action Review** (Step 4) | |

## Level 1, Red – Sabotage/Vandalism

## Level 3, Green – Blocked Culverts/Spillway

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 3, GREEN – BLOCKED CULVERT/SPILLWAY**  Defined as: “Debris is blocking a spillway pipe, causing lake level to rise” | | | **Sheet**  **K3** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 3 notifications on Figure 2.1 have been made. 2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. Monitor water levels and spillway area at least daily. 3. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2). 4. Contact the ***Dam Owner’s Engineer (if applicable)*** at least daily to report the latest observations and conditions. If conditions change significantly, go to the **re-evaluation/decision section** and follow relevant steps immediately.   ***Dam Owner’s Engineer (if applicable)***   1. Review all pertinent information to recommend appropriate actions to the ***EAP Coordinator*** in conjunction with ***NC Dam Safety*** staff. 2. Provide oversight to corrective actions or work as required. 3. Observe conditions on site periodically and provide decision support as appropriate.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** and ***Dam Owner/Operator*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions at least daily or when conditions change significantly. Using Table 1.3, determine if:   1. The event can be terminated when debris is removed from the spillway pipe and the reservoir level has returned to normal pool elevation. 2. The event remains at the current Event Level 3 (No change in situation).   Notify **all** contacts on the Notification Flowchart to advise of current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) TERMINATION** | **B) EVENT LEVEL 3 (NO CHANGE)** |  | |
| Go to **Termination and After-Action Review** (Step 4) | Continue recommended actions on this sheet |  | |

## Level 3, Green – Spillways/Structural

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 3, GREEN – SPILLWAYS/STRUCTURAL**  Defined as: “New minor spillway cracking, spalling, or damage to the spillway gate so that it is unable to be closed” | | | **Sheet**  **L3** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 3 notifications on Figure 2.1 have been made. 2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. Monitor water levels and crack widths for movement or seepage at least daily. 3. Use a bottom drain, installed siphon, or pumps on site to provide additional drawdown of the lake level to a safe elevation. Caution must be taken to not add additional flooding to properties downstream. 4. Install stop logs to isolate the impacted gate bay. 5. Monitor off-site areas to include instrumentation (Applicable to all Action Data Sheets with reference to Instrumentation). 6. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2). 7. Contact the ***Dam Owner’s Engineer (if applicable)*** at least daily to report the latest observations and conditions. If conditions change significantly, go to the **re-evaluation/decision section** and follow relevant steps immediately.   ***Dam Owner’s Engineer (if applicable)***   1. Review all pertinent information to recommend appropriate actions to the ***EAP Coordinator*** in conjunction with ***NC Dam Safety***. 2. Provide oversight to corrective actions or work as required. 3. Observe conditions in site periodically and provide decision support as appropriate.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** and ***Dam Owner/Operator*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions at least daily or when conditions change significantly. Using Table 1.3, determine if:   1. The event can be terminated when it has been determined the cracking, spalling, or damage to the spillway gate does not affect its ability to be closed. 2. The event remains at the current Event Level 3 (No change in situation). 3. The event warrants escalation to Event Level 2 if new spillway cracks or spalls result from structure distress or spillway gates become inoperable or Event Level 1 if mass movement of the concrete structure begins.   Notify **all** contacts on the Notification Flowchart to advise of current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) TERMINATION** | **B) EVENT LEVEL 3 (NO CHANGE)** | **C) EVENT LEVEL ESCALATION** | |
| Go to **Termination and After-Action Review** (Step 4) | Continue recommended actions on this sheet | Go to **Event Level 2 or Event Level 1 Steps 2 & 3** | |

## Level 2, Yellow – Spillways/Structural

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 2, YELLOW – SPILLWAYS/STRUCTURAL**  Defined as: “New spillway cracking or spalling resulting from structure distress or gates become inoperable” | | | **Sheet**  **L2** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP******Coordinator)***   1. Ensure that Event Level 2 notifications on Figure 2.2 have been made. 2. Ensure that the dam and surrounding areas are carefully monitored, and every part of the dam is inspected **without compromising the safety of anyone performing these tasks**. Monitor water levels and development of new cracks or movements every 2 hours for changes. 3. If conditions permit:  * Use a bottom drain, installed siphon, or pumps on site to provide additional drawdown of the lake level to a safe elevation. Caution must be taken to not add additional flooding to properties downstream. * Employ experienced, professional divers to assess the problem and possibly implement repairs, if necessary. * Install stop logs to isolate the impacted gate bay.  1. Monitor off-site areas to include instrumentation (Applicable to all Action Data Sheets with reference to Instrumentation). 2. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2). 3. Contact the ***Dam Owner’s Engineer (if applicable)*** at least twice daily to report the latest observations and conditions. If conditions change significantly, go to the **re-evaluation/decision section** and follow relevant steps immediately.   ***Dam Owner’s Engineer (if applicable)***   1. Review all pertinent information to recommend appropriate actions to the ***EAP Coordinator*** in conjunction with ***NC Dam Safety***. 2. Provide oversight to corrective actions or work as required. 3. Observe conditions in site periodically and provide decision support as appropriate.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions at least twice daily or when conditions change significantly. Using Table 1.3, determine if:   1. The event warrants downgrade to Event Level 3 if the reservoir level is lowered below the area of concern. Notify all contacts on Event Level 2 Notification Flowchart that the Event Level will be downgraded to Event Level 3. 2. The event remains at the current Event Level 2 (No change in situation). 3. The event warrants escalation to Event Level 1 if mass movement of the concrete structure begins.   Notify **all** contacts on the Notification Flowchart to advise of current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) EVENT LEVEL DOWNGRADE** | **B) EVENT LEVEL 2 (NO CHANGE)** | **C) EVENT LEVEL ESCALATION** | |
| Go to **Event Level 3**  **Steps 2 & 3** | Continue recommended actions on this sheet | Go to **Event Level 1**  **Steps 2 & 3** | |

## Level 1, Red – Spillways/Structural

|  |  |  |  |
| --- | --- | --- | --- |
| **LEVEL: 1, RED – SPILLWAYS/STRUCTURAL**  Defined as: “Mass movement of the concrete structure” | | | **Sheet**  **L1** |
| **RECOMMENDED ACTIONS** | | | |
| ***Dam Owner/Operator (Assisted by EAP Coordinator)***   1. Ensure that Event Level 1 notifications on Figure 2.3 have been made. 2. Recommend to the ***Incident Commander* IMMEDIATE EVACUATION** downstream of the dam. 3. Stay a safe distance away from the dam. The immediate concern is the safety of the downstream public. 4. Record all information, observations, and actions on the Unusual or Emergency Event Log (Form 3.2).   ***Dam Owner’s Engineer (if applicable)***   1. Provide decision support and technical support to ***Dam Owner/Operator*** and ***EAP Coordinator*** as appropriate. 2. Advise ***Dam Owner/Operator*** and ***EAP Coordinator*** of dangerous conditions at the dam.   ***NC Dam Safety***  Provide decision support and technical support to the ***Incident Commander*** as appropriate. | | | |
| **RE-EVALUATION / DECISION Based upon Table 1.3** | | | |
| Evaluate conditions CONTINUOUSLY. Using Table 1.3, determine if:   1. The event warrants downgrade to Event Level 2 or Event Level 3 if there is no longer an immediate threat of dam failure AND water level in lake is lowered below the area of concern YET there is damage to the dam that prevents safe impoundment of water. All contacts on Event Level 1 Notification Flowchart shall be notified of a downgrade to Event Level 2 or Event Level 3. 2. The event remains at the current Event Level 1 (No change in situation). 3. Event may be Terminated only when either:  * There is no longer a threat of dam failure AND it has been determined by ***NC Dam Safety*** staff to safely impound water or; * The dam has failed AND there is no longer a threat to the downstream public as determined by ***NC Dam Safety*** staff.   Notify **all** contacts on the Notification Flowchart to advise of current situation and anticipated strategies. | | | |
| **Based on this determination, follow the appropriate actions** | | | |
| **A) EVENT LEVEL DOWNGRADE** | **B) EVENT LEVEL 1**  **(NO CHANGE)** | **C) TERMINATION** | |
| Go to **Event Level 2 or**  **Event Level 3 Steps 2 & 3** | Continue recommended actions on this sheet | Go to **Termination and After-Action Review** (Step 4) | |

## Form 3.2 – Unusual or Emergency Event Log

(To Be Completed During an Emergency)

Dam Name: Dam Name

County Name: County Name

When and How the Event was Detected:

Weather Conditions:

General Description of the Emergency Situation:

Event Level Determination:

Created by (Name/Agency):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Date:** | **Time:** | **From:** | **Action/Event Progression:** | **Recorded By:** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Date** | **Time** | **From** | **Action/Event Progression** | **Recorded By** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

# Step 4: Termination and After-Action Review

Our office recommends coordination of Step 4 with your ***Local Emergency Management***. This section should be completed according to the different levels of emergency events. Our office is not seeking a termination and after-action review for each event/recommended action; the same termination and after-action review procedure can be developed for **Event Level 1, RED** and **Event Level 2, YELLOW**; however, a different response is needed for **Event Level 3, GREEN**.

Once EAP operations have begun under Event Levels 3, 2, or 1, the EAP operations must eventually be terminated and follow-up procedures completed. As shown in the EAP Flowchart (Figure 1.0), EAP operations can only be terminated after completing operations under Event Level 3 or Event Level 1. If Event Level 2 is declared, the operations must be designated Event Level 3 or Event Level 1 before terminating the EAP operations.

### 4.1 Termination Responsibilities

The ***Incident Commander***is responsible for terminating the emergency response operation and relaying the decision to the ***Dam Owner/Operator***, ***EAP Coordinator***, and ***Local Emergency Management***. 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 the Event Level 1 that has not caused actual dam failure, the ***Dam Owner’s Engineer (if applicable)*** or ***NC Dam Safety*** 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 that conditions do not pose a threat to people or property, the ***Incident Commander***will be advised to terminate emergency response operations as described above.

The ***EAP Coordinator*** shall assure that the Unusual or Emergency Event Log (Form 3.2) is completed to document the emergency event and all actions that were taken. The ***EAP Coordinator*** shall distribute copies of the completed log and a revised Record of Revisions and Updates (Appendix E) to all EAP document holders outlined in EAP Distribution Log (Appendix F).

### 4.2 After-Action Review

This is to be performed by the ***EAP Coordinator***.

**Event Level 3, GREEN** – Following the termination of an Event Level 3, ensure all parties that participated in the EAP activities are involved in a comprehensive review process. Impose a time frame within which the review is to be completed. During the review, document any EAP procedures that were followed effectively, as well as any ways that the EAP could be improved, and insert this document into Record of EAP Annual Review, Revision, and Periodic Test (Appendix D).

**Event Level 2, YELLOW** or **Event Level 1, RED** – Following the termination of an Event Level 2 or Event Level 1, ensure all parties that participated in the EAP activities are involved in a comprehensive review process. Impose a time frame within which the review is to be completed. During the review, document any EAP procedures that were followed effectively, as well as any ways that the EAP could be improved, and insert this document into Record of EAP Annual Review, Revision, and Periodic Test (Appendix D). Note any extra measures that must be taken due to the increased severity of the event.

***Event That Has Caused a Loss of Life, Injury or Property Damage*** – In addition to the course of action outlined above for Event Level 2 or Event Level 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 EAP operations. As before, impose a reasonable time frame on the completion of these activities, and insert any conclusions into Record of EAP Annual Review, Revision, and Periodic Test (Appendix D).

# Maps, Figures, and Supporting Data

**Maps, Figures, and Supporting Data**

* Directions and Emergency Access Routes Map (Figure 5.1)
* Residents/Businesses/Roads/Infrastructure at Risk (Table 5.1)
* Downstream Inundation Study (Figure 5.2)
* NC Inventory of Dams Data Sheet (Figure 5.3)

Include any other maps, charts or figures deemed relevant in the case of an emergency event.

**Figure 5.1** **– Directions and Emergency Access Routes Map**

**Insert a directions and emergency access routes map (here) for your dam that includes and adequately shows:**

The location of your dam clearly depicted;

Which road(s) will be accessible during a dam failure for emergency responders to be on site;

Directional arrows (ingress and egress) to show unaffected routes emergency responders may use to access the dam;

Uses a web-based mapping application (e.g. Google Maps) that clearly identifies the location of your dam and surrounding roads that may be used in case of an emergency, but are not affected by the anticipated inundation zone.

**Directions to the Dam from Major Intersections:**

The **Dam Name** is located XX miles from Road/Intersection.

To Access the Dam During an Emergency:

1. List out all turn-by-turn directions to the dam.

2.

3.

4.

5.

6.

7.

8.

9.

10.

**Table 5.1 –** **Residents/Businesses/Roads/Infrastructure at Risk**

Summarize the list of entities as shown on the corresponding Downstream Inundation Study Map (Figure 5.2). All entity numbers listed below must match and be cross-referenced to the Downstream Inundation Study Map (Figure 5.2). Consult with your ***Local Emergency Management*** to determine the proposed method of contact for at-risk parties downstream of a dam.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Entity Number (As shown on inundation study map)** | **Resident/Business/Road**  **or Other Impacted Entity**  **(All properties impacted must be listed)** | **Entity Property Address** | **Proposed Method of Contacting Entity (Phone Number, Emergency Alert System, Reverse 911, CODERED, etc.)** | **Entity’s Distance Downstream from Dam (mi)** |
| 1. | Name of entity | Address/location of entity | Phone Number  (XXX-XXX-XXXX) | X.XX miles |
| 2. | Name of entity | Address/location of entity | Phone Number  (XXX-XXX-XXXX) | X.XX miles |
| 3. | Name of entity | Address/location of entity | Phone Number  (XXX-XXX-XXXX) | X.XX miles |
| 4. | Name of entity | Address/location of entity | County Emergency Alert System | X.XX miles |
| 5. | Name of entity | Address/location of entity | County Emergency Alert System | X.XX miles |
| 6. | Name of entity | Address/location of entity | County Emergency Alert System | X.XX miles |
| 7. | Name of entity | Address/location of entity | Reverse 911 | X.XX miles |
| 8. | Name of entity | Address/location of entity | Reverse 911 | X.XX miles |
| 9. | Name of entity | Address/location of entity | Reverse 911 | X.XX miles |
| 10. | Name of entity | Address/location of entity | CODERED | X.XX miles |
| 11. | Name of entity | Address/location of entity | CODERED | X.XX miles |
| 12. | Name of entity | Address/location of entity | CODERED | X.XX miles |

(Use additional sheets if necessary)

**Figure 5.2 –** **Downstream Inundation Study**

1. As required by NCGS § 143-215.31(a1)(2)(d), a downstream inundation map depicting areas affected by a dam failure and sudden release of the impoundment must be provided. Provide supporting methodology used to develop the inundation map including: methodology used, assumptions made, modeling software used (if any), electronic files of the models, associated inputs, date of creation, legend table, compass, topographic contours, scale size, and directional arrows. The inundation map should depict both the Sunny-Day Breach (simulating a piping failure with the reservoir at normal pool elevation) and the Rainy-Day Breach (simulating an overtopping failure at maximum pool elevation during passage of the SDF) inundation zones. The two scenarios may be shown on the same map or set of maps using different colors. Inundation maps should be developed using an engineering computer model (e.g., HEC-RAS Unsteady Model, or other two-dimensional hydraulic analysis model, etc.), as referenced in FEMA P-946, Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures. The HEC-RAS models are available to anyone at no cost from the US Army Corps of Engineers at: <https://www.hec.usace.army.mil/software/hec-ras/>. The inundation map must depict the inundated areas superimposed on recent aerial imagery or a topographic map (including labeled two-foot interval topographic contours) clearly showing all impacted structures, roads, railroads, and other well-known features (located within the inundation zone extent) and reference each on Residents/Business/Roads/Infrastructure at Risk (Table 5.1). Provide the following information at routine distance intervals on the inundation map: distance from embankment in miles, arrival time of breach wave in minutes, and maximum inundation depth in feet.

2. The downstream limit of the breach inundation zone analysis should be the most downstream point where habitable structures are not located in the non-hydrologic fair weather dam breach inundation zone and the with- and without-dam breach flood elevations for the hydrologic failure converging to a specified vertical tolerance of 1 foot, unless sufficient justification exists for a larger vertical tolerance. Please reference Section 8 of FEMA P-946, Federal Guidelines for Inundation Mapping of Flood Risks Associated with Dam Incidents and Failures for further clarification on the extent of downstream limits.

3. Inundation maps must be included within this EAP document, as they can be better distributed to emergency responders during an emergency within the same document.

4. Per NCGS § 143-215.31(a1)(2)(d), a downstream inundation map depicting areas affected by a dam failure and sudden release of the impoundment does not require preparation by a licensed professional engineer or a person under the responsible charge of a licensed professional engineer unless the dam is associated with a coal combustion residuals surface impoundment.

5. Inundation maps have been developed for this EAP from the best available information using reasonable assumptions and standardized methods. They are approximations of the maximum water surface extents resulting from a complete dam breach and draining of the full reservoir. Inundation maps are empirical hydrologic and hydraulic simulations that can only be field verified in the event of an actual breach. Evacuation areas and call lists should take into consideration the anticipated local impacts of flooding, knowledge of local infrastructure, both occupancy and ownership, and potentially interrupted services or cut-off access, which would be caused by dam failure. Depending upon actual circumstances, appropriate alert and evacuation areas could be either more or less extensive than the simulated inundation zones.

**Insert downstream inundation maps for your dam here.**

**Figure 5.3 – NC Inventory of Dams Data Sheet**

**Insert a one-page summary report (here) for your dam that includes:**

Dam Name: **Dam Name**

State ID: **COUNT-XXX**

Hazard Classification: **High, Intermediate, or Low**

Jurisdictional Status: **Jurisdictional or Exempt**

Dam Type (Select all that apply): **Buttress, Concrete, Rockfill, Masonry, Multi-Arch, Other, Gravity, RCC, Earth, Stone, Timber Crib, Arch**

Dam Purpose (Select all that apply): **Flood Control, Sediment Control, Fish & Wildlife, Grade Stabilization, Hydroelectric, Irrigation, Navigational Locks, Other, Fire Protection, Recreation, Water Supply, Tailings**

Year Constructed: **YYYY**

Regional Office: **Asheville, Fayetteville, Raleigh, Mooresville, Washington, Wilmington, or Winston-Salem**

Quadrangle: **Quadrangle Name**

Latitude and Longitude: **##.####, ##.####**

River or Stream: **River or Stream Name**

River Basin: **Broad, Cape Fear, Catawba, Chowan, French Broad, Hiawassee, Little Tennessee, Lumber, Neuse, New, Pasquotank, Roanoke, Savannah, Tar-Pamlico, Watauga, White Oak, or Yadkin-Pee Dee**

Nearest Downstream City/Town and Distance (mi): **City/Town Name and Distance**

Structural Height (ft): **##.#**

Normal Freeboard (ft): **##.#**

Hydraulic Height (ft): **##.#**

Crest Length (ft): **##**

Crest Width (ft): **##**

Upstream Slope: **#H:1V**

Downstream Slope: **#H:1V**

Low Flow Requirement (cfs): **##**

Maximum Spillway Capacity (cfs): **##**

Normal Pool Elevation (ft): **##.#**

Drainage Area (ac): **##**

Surface Area (ac): **##**

Normal Pool Capacity (ac-ft): **##.#**

Maximum Impoundment Capacity (ac-ft): **##.#**

Prescence of Bottom Drain and Operability?: **Yes or No, Operable or Non-Operable**

Date of Last Regional Office Inspection, Name of Inspector, and Relevant Comments: **Date, Name, and Comments**

Amount, Capacity, and Material Composition of Primary and Emergency Spillways: **Amount, Capacity, and Material Composition**

Alternatively, you may obtain an official NC Inventory of Dams Data Sheet from the Division of Energy, Mineral and Land Resources at (919) 707-9220 or [DamSafety@ncdenr.gov](mailto:DamSafety@ncdenr.gov) to be inserted here.

**Appendices**

## Appendix A – Roles, Responsibilities, and Authority

### *Dam Owner/Operator* (NAME or POSITION TITLE)

• As soon as an unusual or emergency event is observed or reported, immediately determine the emergency level.

– **Event Level 1, RED**: Urgent!! Dam failure imminent or is in progress.

– **Event Level 2, YELLOW**: Potential dam failure situation, rapidly developing.

– **Event Level 3, GREEN**: Unusual event, slowly developing.

• Immediately notify the personnel in the order shown on the notification chart for the appropriate level.

• Provide updates of the situation to the ***Incident Commander*** dispatcher to assist them in making timely and accurate decisions regarding warnings and evacuations.

• Provide leadership to assure the EAP is reviewed and updated annually and copies of the revised EAP are distributed to all who received copies of the original EAP.

### *EAP Coordinator* (NAME or POSITION TITLE)

• ***Dam Owner/Operator*** may designate responsibilities above to an ***EAP Coordinator***.

• Prepare required revisions to the EAP.

• Establish training seminars, coordination of EAP exercises, and after-action reviews.

### *Local Emergency Management* (NAME or POSITION TITLE)

• Coordinate with local responders and dispatchers to ensure that each has an opportunity for input into the EAP, each has a copy of the EAP, and each is aware of their responsibilities.

• Assist in determining who the ***Incident Commander*** would be.

• During an event, maintain communication with ***NC Dam Safety*** staff.

• Assist owners in preparation of the Directions and Emergency Access Routes Map (Figure 5.1).

• Maintain communication with media when necessary.

• When an Event Level 2 situation occurs:

– Prepare response personnel for possible evacuations that may be needed if a Level 1 situation occurs.

– Alert the public as appropriate.

• When an Event Level 1 situation occurs:

– Alert the public.

– Immediately close roads and evacuate people within and possibly adjacent to the inundation area.

• Participate in the annual review and update of the EAP.

### *Incident Commander*

• Serve as the primary contact person responsible for the coordination of all emergency actions.

• When an Event Level 2 situation occurs:

– Prepare responders for possible evacuations that may be needed if a Level 1 situation occurs.

• When an Event Level 1 situation occurs:

– Initiate warnings and order evacuation of people at risk downstream of the dam.

– Notify ***Local Emergency Management*** to carry out the evacuation of people and close roads within the inundation area.

• Decide when to terminate the emergency.

• Participate in an annual review and update of the EAP.

### *Dam Owner’s Engineer (if applicable)* (NAME or COMPANY NAME)

• Advise the ***Dam Owner/Operator*** of the emergency level determination, if time permits.

• Advise the ***Dam Owner/Operator*** of remedial actions to take if a Level 2 event occurs, if time permits.

• Assist the ***Dam Owner/Operator*** in preparation of Action Data Sheets (Table 3.1).

### *NC Dam Safety*

• Advise the ***Incident Commander*** of the emergency level determination, if time permits.

• Provide technical and other assistance to the ***Incident Commander*** as needed.

• Advise the ***Dam Owner/Operator*** of remedial actions to take if an Event Level 2 occurs, if time permits.

## Appendix B – Emergency Services Contacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Agency / Organization** | **Principal Contact** | **Physical Address** | **Office Phone Number** | **Alternate Phone Number** | **Agency Website or Email** |
| State 24-Hour Emergency Watch (After-hours Contact for NC Dam Safety) |  |  | 1-800-858-0368 |  |  |
| Local 911 Call Center |  |  | 911 |  |  |
| Dam Owner/Operator | Name | Address | Phone # | Phone # | Website or Email |
| EAP Coordinator | Name | Address | Phone # | Phone # | Website or Email |
| Local Emergency Management | Name | Address | Phone # | Phone # | Website or Email |
| Dam Owner’s Engineer (**if applicable**) | Name | Address | Phone # | Phone # | Website or Email |
| County Sheriff | Name | Address | Phone # | Phone # | Website or Email |
| Local Police Department | Name | Address | Phone # | Phone # | Website or Email |
| Local Fire Department | Name | Address | Phone # | Phone # | Website or Email |
| Local Highway Patrol | Name | Address | Phone # | Phone # | Website or Email |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| North Carolina Dam Safety Program (NCDEQ, Division of Energy, Mineral, and Land Resources) | Regional Office Engineer | Address | Phone # | Phone # | DamSafety@ncdenr.gov |
| National Weather Service | Name | Address | Phone # |  | Website or Email |
| NC Department of Transportation | Name | Address | Phone # |  | Website or Email |

## Appendix C – Locally Available Resources (Equipment, Labor, and Materials)

Provide the nearest contacts if not available locally.

|  |  |  |  |
| --- | --- | --- | --- |
| **Heavy Equipment Service and Rental Company** | **PHYSICAL ADDRESS** | **PHONE NUMBER** | **WEBSITE** |
| Name | Address | Phone # | Website |
| Name | Address | Phone # | Website |
| **Sand and Gravel Supply** | **PHYSICAL ADDRESS** | **PHONE NUMBER** | **WEBSITE** |
| Name | Address | Phone # | Website |
| Name | Address | Phone # | Website |
| **Ready-Mix Concrete Supply** | **PHYSICAL ADDRESS** | **PHONE NUMBER** | **WEBSITE** |
| Name | Address | Phone # | Website |
| **Pumps** | **PHYSICAL ADDRESS** | **PHONE NUMBER** | **WEBSITE** |
| Name | Address | Phone # | Website |
| **Diving Service** | **PHYSICAL ADDRESS** | **PHONE NUMBER** | **WEBSITE** |
| Name | Address | Phone # | Website |
| **Sandbags** | **PHYSICAL ADDRESS** | **PHONE NUMBER** | **WEBSITE** |
| Name | Address | Phone # | Website |

## Appendix D – Record of EAP Annual Review, Revision, and Periodic Test

***EAPs are required to be updated and resubmitted annually to the North Carolina Dam Safety Program, one year from the anniversary date of the most recent approval. Before this resubmittal, the EAP should be reviewed for correctness and modified to include any changes to the downstream hazards.*** ***If no updates are necessary to the EAP at the time of annual resubmittal, update the date of the EAP on each page and include a cover letter that states there have been no changes in the last year when resubmitting. The annually resubmitted EAP must use the most current EAP template available on the Dam Safety website at:*** [***https://deq.nc.gov/about/divisions/energy-mineral-and-land-resources/dam-safety/planning-dam-emergency***](https://deq.nc.gov/about/divisions/energy-mineral-and-land-resources/dam-safety/planning-dam-emergency)***.***

***The North Carolina Dam Safety Program recommends that a periodic test, including a tabletop exercise, is conducted prior to the annual resubmission of the EAP.***

**EAP Annual Review:**

***The EAP Coordinator at a minimum will be responsible for:***

1. Determining if downstream hazards have changed and updating Residents/Businesses/Roads/Infrastructure at Risk (Table 5.1) accordingly.
2. Contacting all individuals on the notification flowcharts to verify or update names, phone numbers, and specified positions.
3. Contacting and updating the information in Emergency Services Contacts (Appendix B).
4. Contacting and updating the information in Locally Available Resources (Equipment, Labor, and Materials) (Appendix C).

**EAP Periodic Test:**

***The EAP Coordinator at a minimum will be responsible for:***

1. Inviting all agencies involved within the EAP.
2. Coordinating the development of a tabletop exercise (develop objectives, scenario, messages, after-action review).
3. Hosting and facilitating the tabletop exercise.

**Revision:**

The ***EAP Coordinator***is responsible for updating the EAP document and ensuring that all copies of the EAP document are revised. The EAP document held by the ***EAP Coordinator*** is the master EAP document. When revisions occur, the ***EAP Coordinator*** will provide the revised pages and a revised Record of Revisions and Updates (Appendix E) to all the EAP document holders listed in EAP Distribution Log (Appendix F). The document holders are responsible for revising outdated copies of the respective document(s) whenever revisions are received. Outdated pages shall be immediately discarded to avoid any confusion with the revisions.

## Appendix E – Record of Revisions and Updates

|  |  |  |
| --- | --- | --- |
| **Revision No.** | **Date** | **What Revisions Were Made** |
| 01 | Date | Page and Section of EAP Revision |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

## Appendix F – EAP Distribution Log

|  |  |
| --- | --- |
| **Copy Number** | **Agency / Organization** |
| 1 | Name of Dam Owner/Operator  Physical Address  Phone Number  Email |
| 2 | North Carolina Dam Safety Program  1612 Mail Service Center  Raleigh, North Carolina 27699-1612  (919) 707-9220  [DamSafety@ncdenr.gov](mailto:DamSafety@ncdenr.gov) |
| 3 | Name of EAP Coordinator  Physical Address  Phone Number  Email |
| 4 | Name of Local Emergency Management  Physical Address  Phone Number  Email |
| 5 | Name of Dam Owner’s Engineer (**if applicable**)  Physical Address  Phone Number  Email |

## Appendix G – Engineering Documents

**Include all available engineering records and documentation, including but not limited to:**

* Hydrology and Hydraulics Memorandum summarizing the analyses performed and assumptions to evaluate the dam breach inundation boundaries and develop the dam breach inundation maps. Include computer programs used, versions, etc.
* Reservoir Area – Capacity Curve
* Principal Spillway Rating Curve
* Emergency Spillway (Top of Dam) Rating Curve
* Annotated Site Pictures
* Plan View of the Dam
* As-Built and/or Survey Drawings

## Appendix H – Glossary of Terms

|  |  |
| --- | --- |
| **Abutment** | The 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. |
| **Appurtenances** | Structures incident to or annexed to dams essential to the proper operation, maintenance or functioning of the dam. This includes such structures as spillways, low-level outlet works, and water conduits, such as tunnels, pipelines, or penstocks, either through a dam or its abutments. |
| **Breach** | 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. |
| **Control section** | An usually level segment in the profile of an open channel spillway above which water in the reservoir discharges through the spillway. |
| **Dam** | An artificial barrier generally constructed across a watercourse to impound or divert water. |
| **Emergency spillway** | The appurtenant structure that provides the controlled conveyance of excess water through, over, or around the dam. |
| **Incident Commander** | (IC) is responsible for directing and/or controlling resources under explicit legal, agency, or delegated authority. The individual responsible for the overall management of the response is called the Incident Commander. For responses under the National Response System (NRS), the pre-designated On-Scene Coordinator (OSC) generally assumes the role of Incident Commander. |
| **Instrumentation** | 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 spillway structures. Examples include seepage measuring weirs, piezometers, inclinometers and survey monuments. |
| **Low-level outlet works** | An appurtenant structure, usually consisting of a pipe through the embankment or principal spillway structure equipped with a valve, whose purpose is to allow lowering the lake level. |
| **Principal spillway** | The appurtenant structure that conveys normal inflow through or around the embankment. |
| **Reservoir** | The body of water is impounded or potentially impounded by the dam. |
| **Seepage** | The natural movement of water through the embankment, foundation, or abutment of the dam. |
| **SERT (State Emergency Response Team)** | A collection of state agencies, non-profits, and voluntary organizations which provide support to local government agencies in their response, recovery, preparedness, and mitigation of natural & technological hazard. |
| **Unusual Event** | An event which takes place, or a condition which develops, that is not normally encountered in the routine operation of the dam and reservoir or necessitates a variation from the operating procedures. |