APPENDIX C

Example Emergency Action Plan for a Small Dam

(NAME) DAM

TX0####

EMERGENCY ACTION PLAN

Date

Prepared for

(Name)

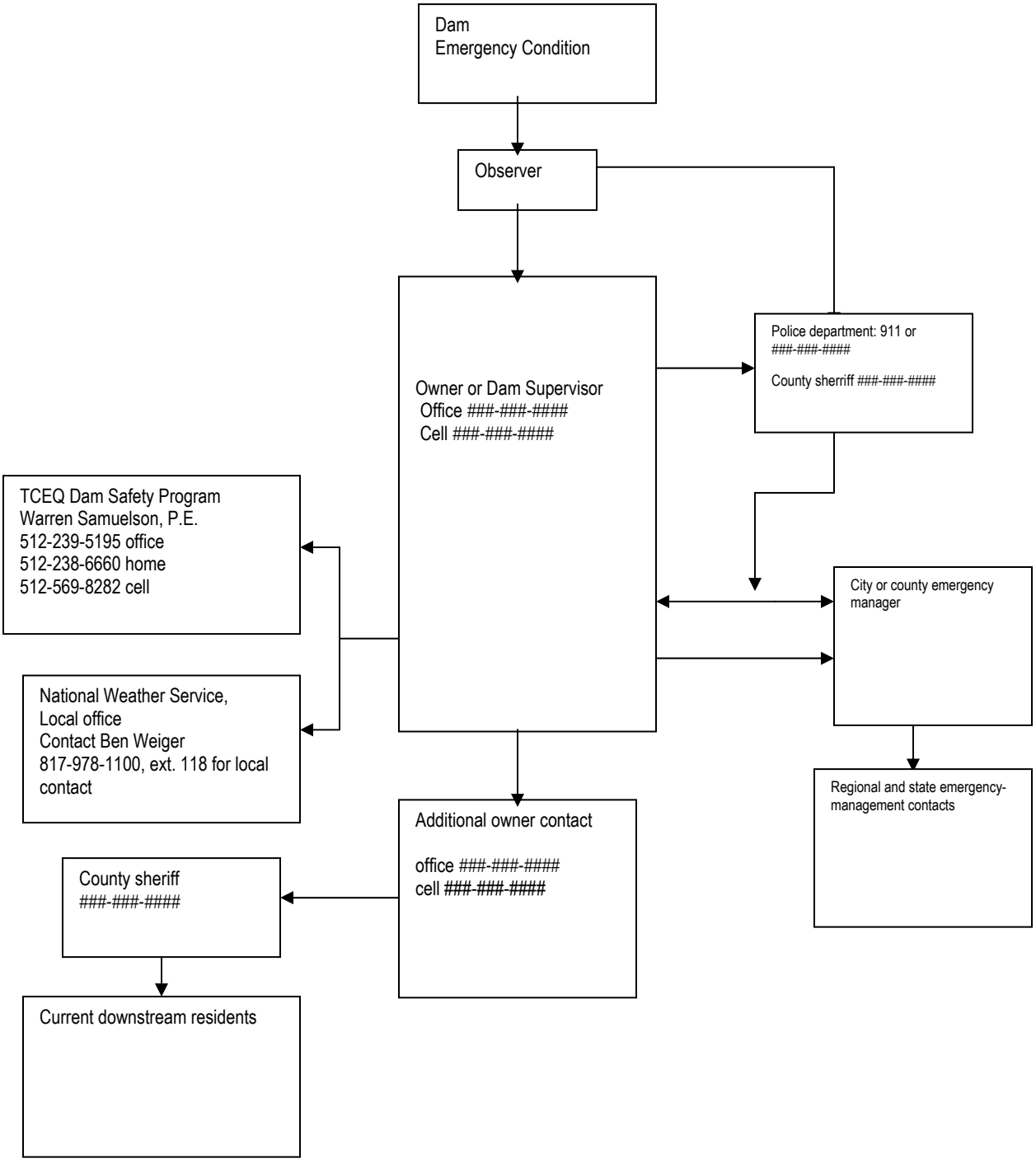
Prepared by

(Name)

Emergency Action Plan
(Name) Dam
(Owner), Inc.

CONTENTS

NOTIFICATION FLOWCHART



(NAME) DAM

LOG SHEET OF CHANGES

Date	Change Made	Signature

APPROVAL AND IMPLEMENTATION

EMERGENCY ACTION PLAN

(NAME) DAM

This Emergency Action Plan is hereby approved. This plan is effective immediately and supersedes all previous editions.

Name and Title of Emergency Planning Manager	Date
Name and Title of Appropriate Manager for Owner	Date

EMERGENCY ACTION PLAN

(NAME) DAM

1. Purpose

The purpose of this plan is to describe procedures to be followed in an actual or potential emergency associated with *(Name)* Dam caused by an unusually large flood, an earthquake, a structural malfunction, or malicious human activity such as sabotage, vandalism or terrorism, causing failure or compromise of the dam itself.

This Emergency Action Plan (EAP) defines protocols to identify unusual and unlikely conditions that may endanger the integrity of the dam and emergency protocols to warn downstream residents of its impending or actual failure.

2. Project Description

(The project can be described in this section or as shown in Tab 2.)

3. Responsibilities

3.1. Dam Owner's Responsibilities

The owner, *(Name)*, is responsible for all dam operation and maintenance. The EAP will not designate a specific person for a specific responsibility but instead will designate the person's duties or job description.

The *(title)* is the first line of dam observers and is the person responsible to initiate implementation of the EAP. The *(title)* is responsible for conducting routine dam maintenance, such as annual brush control, conducting dam integrity inspections, and notifying *(title)* of any potential emergency situations. The *(title)* is responsible for contacting emergency personnel should a dam failure be imminent.

The *(title)* is also responsible for updating the EAP. An annual EAP review should be conducted to ensure that contact names and numbers are current on the Notification Flowchart.

The *(title)* is also responsible for directing specific, incident-appropriate actions during an emergency, such as opening or closing water intakes and remedial construction activities such as dirt moving, etc. Specific scenarios are not listed in this EAP.

3.2. Responsibilities for Notification

The *(title)* is responsible for inspecting the dam in a potential emergency such as potential the threat of high waters or a tornado. The *(title)* will contact the *AAA* County sheriff and emergency manager. Sample notifications and news releases appear in Tab 4 and Tab 5.

If warranted, the *(title)* will notify the TCEQ Dam Safety Program. The *AAA* County sheriff will notify downstream residents. The *AAA* County emergency manager will implement the notification flowchart for regional and state emergency-management contacts.

3.3. Responsibilities for Evacuation

The *AAA* County Sheriff's office is responsible for initiating evacuations.

3.4. Responsibilities for Duration, Security, Termination, and Follow-up

The *(title)* is responsible for monitoring of emergency situations at the dam and keeping authorities informed, based on the Notification Flowchart.

The *(title)* and the *AAA* County emergency-management coordinator are responsible for declaring that an emergency at the dam is terminated. Applicable authorities will be notified based on the Notification Flowchart.

4. Possible Emergency Conditions

Daily surveillance at the site and during an event will be the normal method of detecting potential emergency situations. Contact the TCEQ Dam Safety Office for determinations of dam conditions. Each event or situation will be placed in one of the following classifications:

- **Non-failure concern.** A problem is developing; however, the dam is not in danger of failing, but flooding is expected downstream. Contact the *AAA* County Sheriff's office.
- **Potential failure.** A situation is developing that could cause the dam to fail. Contact the *AAA* County Sheriff's office.
- **Imminent failure.** A dam failure is occurring that may result in flooding that threatens life and property. When the owner determines that there no time remains to implement measures to prevent failure, the *AAA* County Sheriff's Office will be notified for implementation of emergency procedures.

Events that can lead to the failure of the dam are discussed below:

If the reservoir level rises to within 1 foot of the top of the dam, *(Owner)* will contact the *AAA* County Sheriff's office.

Other determining factors that could cause the emergency action plan to be implemented are discharge rates of creeks or rivers high enough to affect a dam site, sloughing, rapid seepage, cracks, sliding, malicious human actions (sabotage, vandalism, or terrorism), etc.

Once there is no longer an emergency at the dam site, the applicable County's Emergency Management Agency will be notified; that office will then determine whether the emergency protocol should be terminated, and will notify appropriate parties.

5. Preventive Actions

Preparations are to be taken to prevent, or to help reduce the effects of, a dam failure and facilitate emergency response. The following are some steps that could prevent or delay failure after an emergency is first discovered. **These actions should only be performed under the direction of a qualified professional engineer or contractor. In all cases the personnel of the TCEQ Dam Safety Office must be notified.**

Due to the seriousness of the items discussed below, it is paramount that the *AAA* COUNTY SHERIFF'S OFFICE be notified should any of these situations occur.

If the Dam's Integrity Is Threatened

Overtopping by flood waters

(a) Give erosion-resistant protection to the downstream slope by placing plastic sheets or other materials over eroding areas.

(b) Divert floodwaters around the reservoir basin, if possible.

A slide on the upstream or downstream slope of the embankment

(a) Lower the water level in the reservoir at a rate, and to an elevation, considered safe given the slide condition. If the outlet is damaged or blocked, pumping or siphoning may be required.

(b) Stabilize any slide on the downstream slope by weighting the toe area below the slide with additional soil, rock, or gravel.

Erosional seepage or leakage (piping) through the embankment, foundation, or abutments

(a) Plug the flow with whatever material is available (hay bales, bentonite, or plastic sheeting, if the entrance to the leak is in the reservoir).

(b) Lower the water level in the reservoir until the flow decreases to a non-erosive velocity or until it stops.

(c) Place an inverted filter (a protective sand-and-gravel filter) over the exit area to hold materials in place.

(d) Continue lowering the water level until a safe elevation is reached; continue operating at a reduced level until repairs are made.

A failure of an appurtenant structure such as an inlet or outlet of the spillway

(a) Implement temporary measures to protect the damaged structure, such as closing the inlet or putting in place temporary protection for a damaged spillway.

(b) Employ experienced, professional divers, if necessary, to assess the problem and possibly implement repair.

(c) Lower the water level in the reservoir to a safe elevation. If the inlet is inoperable, pumping or siphoning may be required.

A mass movement of the dam on its foundation (spreading or mass sliding failure)

(a) Immediately lower the water level until excessive movement stops.

(b) Continue lowering the water level until a safe level is reached; continue operation at a reduced level until repairs are made.

Auxiliary spillway erosion threatening reservoir evacuation

(a) Provide temporary protection at the point of erosion by putting in place sandbags, riprap materials, or plastic sheets weighted with sandbags.

(b) Consider pumps and siphons to help reduce the water level in the reservoir.

(c) When inflow subsides, lower the water in the reservoir to a safe level; continue operating at a lower water level in order to minimize spillway flow.

Excessive settlement of the embankment

(a) Lower the water level by releasing it through the outlet or by pumping or siphoning.

(b) If necessary, restore freeboard, preferably using sandbags.

(c) Lower the water in the reservoir to a safe level; continue operating at a reduced level until repairs can be made.

Malicious human activity (sabotage, vandalism, or terrorism)

(a) If malicious human activity that could endanger public safety is suspected, contact law-enforcement personnel for their help in evaluating the situation.

(b) If the principal spillway has been damaged or plugged, implement temporary measures to protect the damaged structure. Employ experienced, professional divers, if necessary, to assess the problem and possibly implement repair.

(c) If the embankment or auxiliary spillway has been damaged or partially removed, provide temporary protection in the damaged area by putting in place sandbags, riprap materials, or plastic sheets weighted with sandbags. Use pumps and siphons to help reduce the water level in the reservoir.

(d) If the water supply has been contaminated, immediately close all inlets to the water supply system and notify appropriate authorities.

6. Supplies and Resources

In an emergency, equipment, supplies, and other resources may be needed on short notice, such as sandbags, riprap, fill materials, and heavy equipment. Resources that may be helpful include:

- earth-moving equipment
- riprap
- sand and gravel
- sandbags
- pumps
- pipe
- laborers
- lighting equipment

(Also include a list of contractors.)

(Owner) will also be in direct consultation with the TCEQ Dam Safety Office, which is able to offer appropriate plans of action and advice.

In any EAP implementation, the Notification Flowchart will apply.

7. Inundation Map

A breach inundation study was not performed for this Emergency Action Plan due to the limited development downstream.

8. Implementation

8.1. Plan Maintenance

This plan shall be reviewed and updated annually by *(Owner)* and personnel from local emergency-management agencies in conjunction with *(Owner)*'s annual maintenance inspection of all dams. All signatories to this plan are encouraged to attend, to ensure that all names and contact information are current.

8.2. Training

All people involved in the EAP shall be trained to ensure that they are thoroughly familiar with its elements, the availability of equipment, and their responsibilities and duties under the plan. Personnel shall be trained in problem detection, evaluation, and appropriate corrective measures. This training is essential for proper evaluation of developing situations at all levels of responsibility.

A tabletop exercise shall be conducted at least once every five years. The tabletop exercise involves a meeting of *(Owner)* with state and local emergency-management officials in a conference room. The exercise begins with a description of a simulated event and proceeds with discussions by the participants to evaluate the EAP and response procedures, and to resolve concerns regarding coordination and responsibilities. Any problems identified during an exercise should be included in revisions to the EAP. Records of training and exercises should be maintained in Tab 7.

8.3. Distribution

Copies of this Emergency Action Plan have been supplied to all of its signatories. Large-scale maps are on file with the local emergency-management agency in *AAA* County for evacuations.

TAB 1

VICINITY MAP

TAB 2

PROJECT DESCRIPTION

Official Dam Name:

Stream:

Location:

Dam Owner:

Address:

Phone Number:

Type of Dam: *compacted earthfill*

Year Constructed:

Dam Height: ### *feet* Dam Length: ### *feet*

Drainage Area: #### *square miles* Hazard Classification: *(identify) Hazard*

Principal Spillway:

Principal Spillway Capacity:

Auxiliary Spillway Type and Maximum Capacity:

Normal Storage Volume: #### *acre-feet*

Maximum Storage Volume: #### *acre-feet*

Elevations (Mean Sea Level) Principal Spillway Crest:
Auxiliary Spillway Crest:
Top of Dam:

TAB 3

DOWNSTREAM AREA MAP

TAB 4

SAMPLE NOTIFICATION MESSAGES

Note: These notification messages will be coordinated through the *(Owner)*, *(title of dam emergency planner)*, the National Weather Service, the Department of Public Safety Regional Liaison office, and the Emergency Management Coordinators for *AAA*, *BBB*, and *CCC* counties before they are disseminated to downstream organizations. Messages developed with the assistance of the National Weather Service may be used instead.

"Watch" Condition Message

This is an emergency message. *(Owner)* has declared a "watch" condition for *(Name)* Dam, Texas ID TX0####. *(Briefly describe the problem or condition.)* There is no immediate danger of the dam failing; however, the potential does exist. We request that you initiate appropriate emergency-management procedures. For verification, call the phone numbers listed on the Notification Flowchart of the Emergency Action Plan for *(Name)* Dam. The Department of Public Safety *(Location)* District Regional Liaison Office has been notified of this condition and may be contacted for information on emergency procedures. *(Owner)* will supply additional information regarding the status of the dam as it becomes available.

"Possible Dam Failure" Warning

This is an emergency message. *(Owner)* has declared a "possible failure" condition for *(Name)* Dam, Texas ID TX0####. *(Briefly describe the problem or condition.)* There is a possibility that the dam could fail. Attempts to save the dam are under way, but their success cannot be determined as yet. Emergency water releases to lower the lake *(are/are not)* being made. We request that you initiate appropriate emergency management procedures and prepare for evacuation of the threatened areas. If *(Name)* Dam does fail, flooding will occur along the *(Stream)*, the *(Stream)*, and the *(Stream)*. For verification, call the phone numbers listed on the Notification Flowchart of the Emergency Action Plan for *(Name)* Dam. The Department of Public Safety *(Location)* District Regional Liaison office and the Emergency Management Coordinators for *AAA*, *BBB*, and *CCC* counties have been notified of this condition and may be contacted for information on emergency procedures. *(Owner)* will supply additional information regarding the status of the dam as it becomes available.

"Imminent Dam Failure" Warning

Urgent! This is an emergency message. *(Owner)* has declared that *(Name)* Dam, Texas ID TX0####, is in imminent danger of failing. Attempts to save the dam will continue, but their success is unlikely. We request that you initiate appropriate emergency management procedures and begin evacuation of threatened areas. It is probable that the dam will fail in hours. If *(Name)* Dam fails, a flood wave will move down the *(Stream)*, up the *(Stream)*, and upstream and downstream on the *(Stream)*. For verification, call the phone numbers listed on the Notification Flowchart of the Emergency Action Plan for *(Name)* Dam. The Department of Public Safety *(Location)* District Regional Liaison Office and Emergency Management Coordinators for *AAA*, *BBB*, and *CCC* counties have been notified of this condition and may be contacted for information on emergency procedures.

"Dam Failure" Message

Emergency! This is an emergency message. *(Owner)* has declared that *(Name)* Dam, Texas ID TX0####, has failed. A flood wave is moving down the *(Stream)*, up the *(Stream)*, and upstream and downstream on the *(Stream)* toward *(City)* and *(City)*. The flood waters have already reached *(Road)*, *(Road)*, and *(Road)* on *(Stream)*. The City of *(Name)* will begin flooding at *(time—give number of hours after PMF breach)*. FM *(###)* on the *(Name)* River will begin flooding at *(time—prior to a PMF breach, give number of minutes after a sunny-day breach)*. The flood wave will go up the *(Stream)* and flood areas along

the river. *(Road)* in *AAA* County will begin flooding at *(time—prior to a PMF breach and three hours after a sunny-day breach)*. SH *(##)* at *(landmark)* will begin flooding at *(time—give number of hours after a PMF breach)*. Evacuate threatened areas immediately. For verification, call the phone numbers listed on the Notification Flowchart of the Emergency Action Plan for *(Name)* Dam. The Department of Public Safety *(Location)* District Regional Liaison office and the Emergency Management Coordinators for *AAA*, *BBB*, and *CCC* counties have been notified of this condition.

TAB 5

SAMPLE NEWS RELEASES

Note: Coordinate with the National Weather Service, the Department of Public Safety *(Location)* District Regional Liaison office, and the emergency management directors for *AAA*, *BBB*, and *CCC* counties prior to release. Messages developed with the assistance of the National Weather Service may be used instead.

Announcement for a Slowly Developing "Watch" Condition

(Owner) has declared a "Watch" condition for *(Name)* Dam as of *(time and date). (Briefly describe the problem or condition.)* There is no immediate danger of the dam failing; however the potential does exist. *(Describe what actions are being taken to monitor and control the situation.) (State the quantity of any releases.)*

Announcement for a Possible Dam Failure

(Owner) has declared a possible dam failure at *(Name)* Dam as of *(time and date). (Briefly describe the problem or condition.)* It is possible the dam could fail. Attempts to save the dam are under way, but their success cannot be determined as yet. *(Describe what actions are being taken to monitor and control the situation.) (State the quantity of any releases.)* Additional news will be made available as soon as it is received.

Announcement for an Imminent Dam Failure

Urgent! *(Owner)* has announced that *(Name)* Dam is in imminent danger of failing. *(Describe what actions are being taken to monitor and control the situation.)* It is possible that the dam will fail in *(##)* hours. Residents in low lying areas along the *(Stream)*, the *(Stream)*, and the *(Stream)*, as well as the town of *(Name)*, should prepare for immediate evacuation. Additional news will be made available as soon as it is received.

Announcement of a Dam Failure

Emergency! *(Name)* Dam failed at *(time and date)*. Residents who have not yet done so should immediately evacuate the city of *(Name)* and low-lying areas along the *(Stream)*, the *(Stream)*, and the *(Stream)*. The flood waters have already reached *(Highway)* and *(Road)*. Additional news will be made available as soon as it is received.

TAB 6

DIRECTORY OF PERSONNEL WITH DAM-SAFETY EXPERTISE

The following list identifies other individuals with expertise in dam safety, design and construction that may be consulted about taking specific actions at the dam when there is an emergency situation:

NAME	TELEPHONE	RESPONSIBILITY

TAB 7

TRAINING RECORD

Use this form to record training sessions. File the completed form in Tab 7 of the EAP. Thorough review of all items in the EAP should be thoroughly reviewed during training. Appropriate *(Owner)* employees and EAP team members should attend a training session annually (or participate in a simulated exercise).
TRAINING LOCATION: _____
DATE: _____ TIME: _____ INSTRUCTOR: _____
CLASS SIGN-IN

TAB 7 (continued)

SIMULATED-EMERGENCY EXERCISE

Date of Exercise:	
Participant Sign-In:	
Type of Simulation Conducted:	**Circle Emergency Type:** emergency water release watch condition imminent dam failure actual dam failure
Comments, Results of Exercise:	
Revisions Needed to EAP Based on Results of Exercise?	**☐ Yes ☐ No** **If yes, list revisions required:**

PLAN REVIEW AND UPDATE

This plan will be reviewed and updated annually and tabletop exercises will be conducted at least once every five years. Document these reviews below.

Date of review: _____ Participants:

Date of review: _____ Participants:

Date of review: _____ Participants:

Date of review: _____ Participants:

Date of tabletop exercise: _____ Participants:

TAB 8

ANNUAL EAP EVALUATION CHECKLIST

Was the annual dam inspection conducted?	□ Yes □ No	If yes, is the checklist signed and included in the EAP?	□ Yes □ No
Was brush clearing, animal-burrow removal, or other maintenance required?	□ Yes □ No	If yes, describe actions taken and date:	
Was the outlet gate operable?	□ Yes □ No	If no, describe actions taken and date:	
Does the Notification Flowchart require revision?	□ Yes □ No	If yes, date revised Contact Information pages were distributed: (Note that revision of the Contact Information will not require EAP approval; however, the revised Contact Information pages will need to be redistributed as a replacement pages.)	
Was annual training or an exercise conducted?	□ Yes □ No	Circle: training exercise Date conducted:	
Are inspection and training records included in the EAP?	□ Yes □ No		
Was the EAP reviewed?	□ Yes □ No	If yes, review date:	
Were changes required to the EAP?	□ Yes □ No	If yes, date of revised EAP approval:	

Signature of dam supervisor: _____ Date completed: _____