EMERGENCY ACTION PLANS

PREPARATION

2025 Dam Safety Workshop

DAM SAFETY PROGRAM
Texas Commission on Environmental Quality

WHAT WE'LL COVER

1. EAP Basics
2. Annual Forms
3. Common Mistakes
4. EAP Template Review
5. Tips
6. Q&A

NOTE: Presentation photos taken by TCEQ inspectors at dams in the last couple years.

WHY HAVE AN EAP?

Next to Maintenance, the EAP is the Dam Owner's best friend.

The EAP is a plan that is used to warn affected downstream residents and businesses in the event of a dam failure and is a critical document for dam safety.

EMERGENCY ACTION PLANS

EAPs required for:

- High hazard dams
- Non-exempt significant hazard dams

EAPs recommended for:

- Exempt significant hazard dams

Guidelines

EAP guidelines and templates available

- Updated in 2019

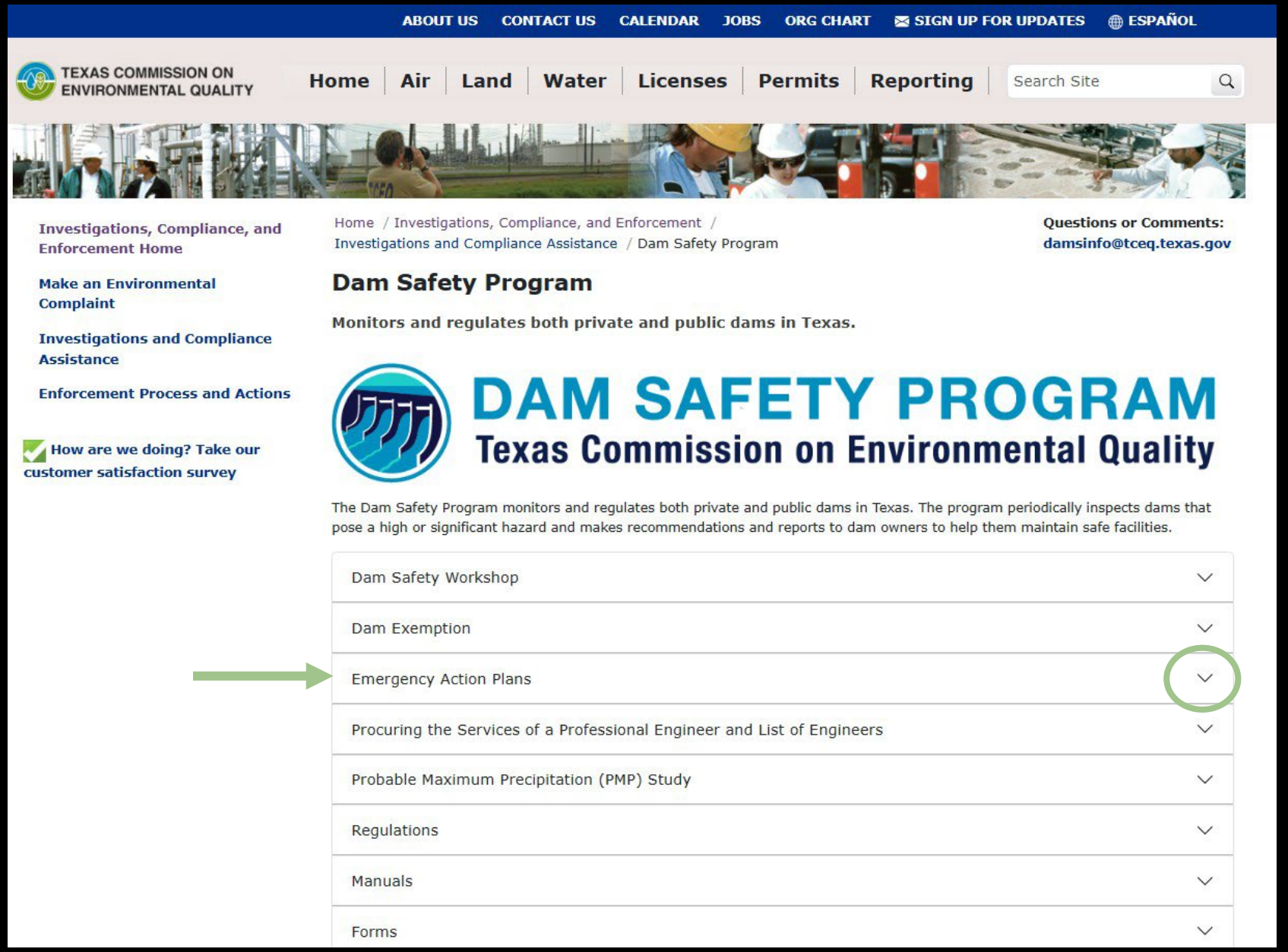
- https://www.tceq.texas.gov/compliance/investigation/damsafety_prog.html

Guidelines for Developing Emergency Action Plans for Dams in Texas

Dam Safety Program
Critical Infrastructure Division
Texas Commission on Environmental Quality

GI-394
Revised December 2019

WEBPAGE



Dam Safety Program - Texas Commission on Environmental Quality - www.tceq.texas.gov

WEBPAGE

Emergency Action Plans

In accordance with **Title 30 Texas Administrative Code (TAC) Chapter 299, Dams and Reservoirs, §299.61(b)**, owners of significant and high hazard dams were required to submit an Emergency Action Plan, which may be a draft version, to the executive director for review by January 1, 2011. If you have any questions about the preparation and submittal of EAPs, please contact the Dam Safety Section at **(512) 239-0326** for assistance.

The **Guidelines for Developing Emergency Action Plans (EAPs)** for Dams in Texas publication was revised in December 2019. The revised publication includes updates to the notification flowchart, EAP templates, inundation map guidance, and a glossary of dam safety terms.

- Template for an Emergency Action Plan for a Large Dam (Appendix C) (**DOC**)
- Template for an Emergency Action Plan for an Intermediate or Small Dam (Appendix D) (**DOC**)

Emergency Action Plans must be delivered to either:

- Trina Lancaster, P. E., Manager, Dam Safety Section
- Denice McCalley, P.E, EAP Coordinator, Dam Safety Section; or
- Gracyn Covert, E.I.T., Assistant EAP Coordinator, Dam Safety Section

at the following address:

Texas Commission on Environmental Quality
MC-177
P.O. Box 13087
Austin, TX 78711-3087

A cold dam day!

ANNUAL FORMS

- EAPs must be reviewed and updated annually – letter/email acknowledgement sent to TCEQ with Log Sheet
- Update as often as needed
- Don't forget!
  - ❑ Log Sheet of Changes (send to TCEQ with email/letter)
  - ❑ Annual Review Checklist (keep on file)
  - ❑ Plan Review & Update page (keep on file)
  - ❑ Training Records-Annual (keep on file)
- Approval & Implementation page
  - ❑ Check A&I signatures match Notification Flowchart Names

EMERGENCY ACTION PLANS – ANNUAL FORMS

HAPPY HOME DAM, TX09999

LOG SHEET OF CHANGES

The following changes have been made to the EAP and revisions have been provided to the individuals shown on the EAP Distribution List.

Date	Change Made	Signature
4/18/2023	Annual forms completed – Tabs 7, 8, 9; see attached	Doris Lifeisgood
4/5/2024	Notification Flowcharts changed; A&I page changed; annual forms (Tabs 7-9) updated	Doris Lifeisgood
5/1/2025	Annual forms completed and kept in house	

Date	Change Made	Signature
4/18/2023	Annual forms completed – Tabs 7, 8, 9; see attached	Doris Lifeisgood
4/5/2024	Notification Flowcharts changed; A&I page changed; annual forms (Tabs 7-9) updated	Doris Lifeisgood
5/1/2025	Annual forms completed and kept in house	

TAB 7

ANNUAL EAP EVALUATION CHECKLIST

Was the annual dam inspection conducted?	☑ Yes ☐ No	If yes, has the EAP been revised to include any signs of failures observed during the inspection?	☐ 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:	
Do the Notification Flowcharts require revision? (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.)	☑ Yes ☐ No	If yes, list the dates of the contact information revision and redistribution:	
Was annual training or an exercise conducted?	☑ Yes ☐ No	Circle: training exercise Date conducted: 4/1/2025	
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:	

[Name and Title of Appropriate Manager for Owner]

4/4/2025
Date

EMERGENCY ACTION PLANS – ANNUAL FORMS

TAB 8
PLAN REVIEW AND UPDATE

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

Date of review: 4/1/23 — Participants: Suzy Que, Joe Prescott, Mabel Right, John Star

Date of review: 4/1/24 — Participants: Suzy Que, Joe Prescott, Mabel Right

Date of review: 4/1/25 — Participants: Joe Prescott, John Star

Date of review: _____ — Participants:

Date of tabletop exercise: _____ — Participants:

TAB 9
TRAINING RECORD

Use this form to record training sessions. File the completed form in the appropriate Tab of the EAP. 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: ABGB County Office	
DATE: 4/1/2023 ME: INSTRUCTOR: Joe Prescott	
CLASS SIGN-IN:	
Name A	
Name B	
Name C	
Name D	
Type of Simulation Conducted:	**Circle Emergency Type:** Emergency water release; Watch condition; Possible dam failure; 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:	

4/4/2025

COMMON EAP MISTAKES

COMMON MISTAKES – DRAFT SUBMITTALS

- A&I Page Signatures missing or don't match flowchart
- Resident notification block missing from flowchart
- Department of Public Safety block (verify if it should be Texas Division of Emergency Management – TDEM)
- Submittal of only one Notification Flowchart
  - Watch condition
  - Potential/ Imminent Failure Condition
  - *HB26 – Gate Release Condition (only dams with floodgates)

COMMON MISTAKES – ANNUAL UPDATES

- Sending new pdf without page changes indicated
- A&I Page Signatures missing or don't match flowchart
- Previous TCEQ comments ignored
- Blank Log Sheet of Changes or none submitted

Changes

- Distribution list: Warren Samuelson >>> Trina Lancaster
- May submit annual forms to TCEQ or keep them on file
- If only annual forms are updated, may submit Log Sheet only with changes recorded

  EX: "2025-Annual Forms completed and kept in-house"

EAP TEMPLATE

EAP Guidelines - Templates

- Appendix C - Large Dams (page 27)
- Appendix D - Intermediate/Small Dams (page 59)

EAP TEMPLATE

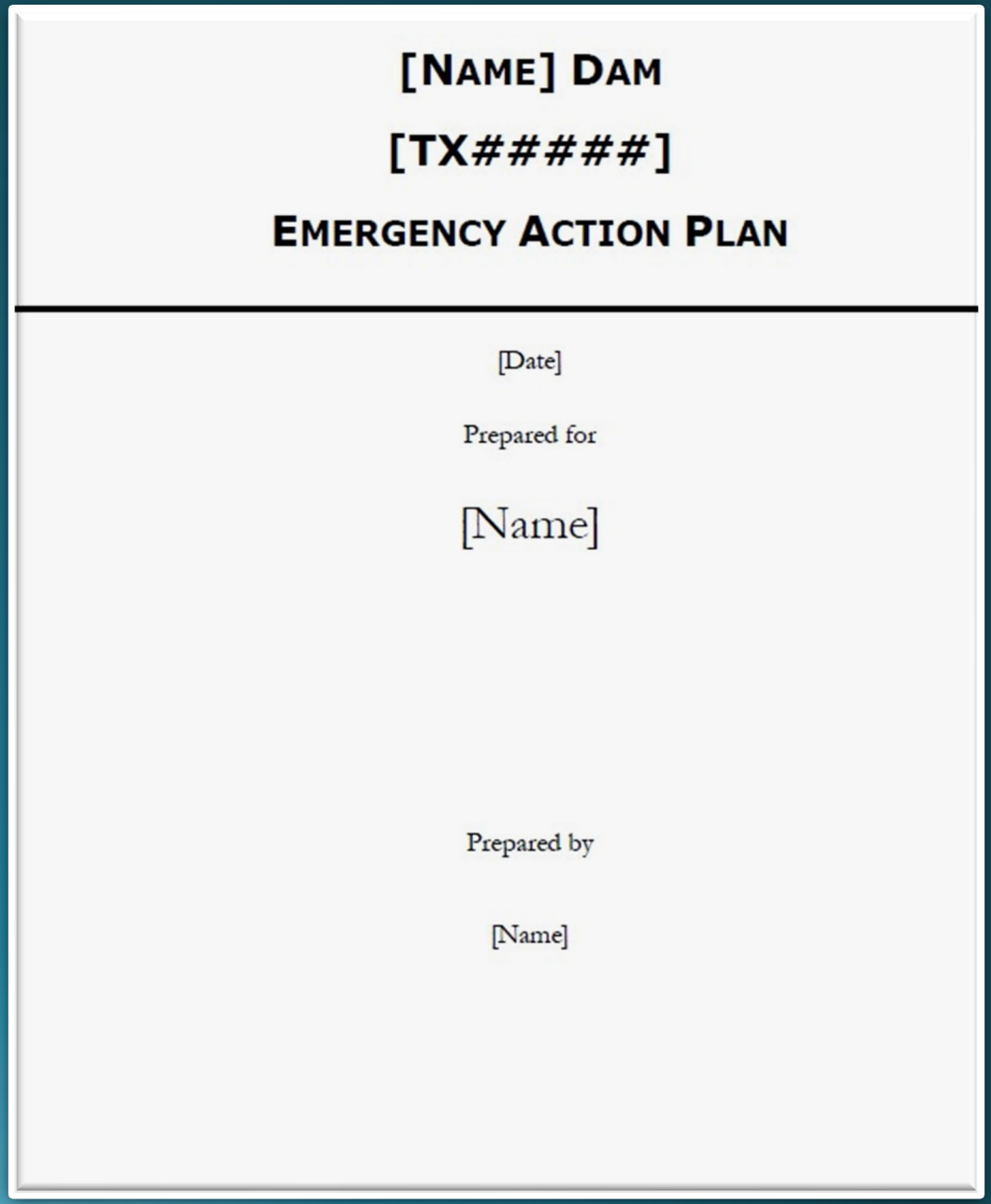
- Appendix C - Large Dams
- Appendix D - Intermediate/Small Dams

Right there in the Emergency Spillway!

EAP TEMPLATE

COVER PAGE
(C29, D61)

- Correct name of the dam – not necessarily the same as the reservoir
- TX##### - fill this in! Contact us if unknown
- Date – include and update for each revision
- Remove brackets – they just indicate where the information is needed


[NAME] DAM

[TX#####]

EMERGENCY ACTION PLAN

[Date]

Prepared for

[Name]

Prepared by

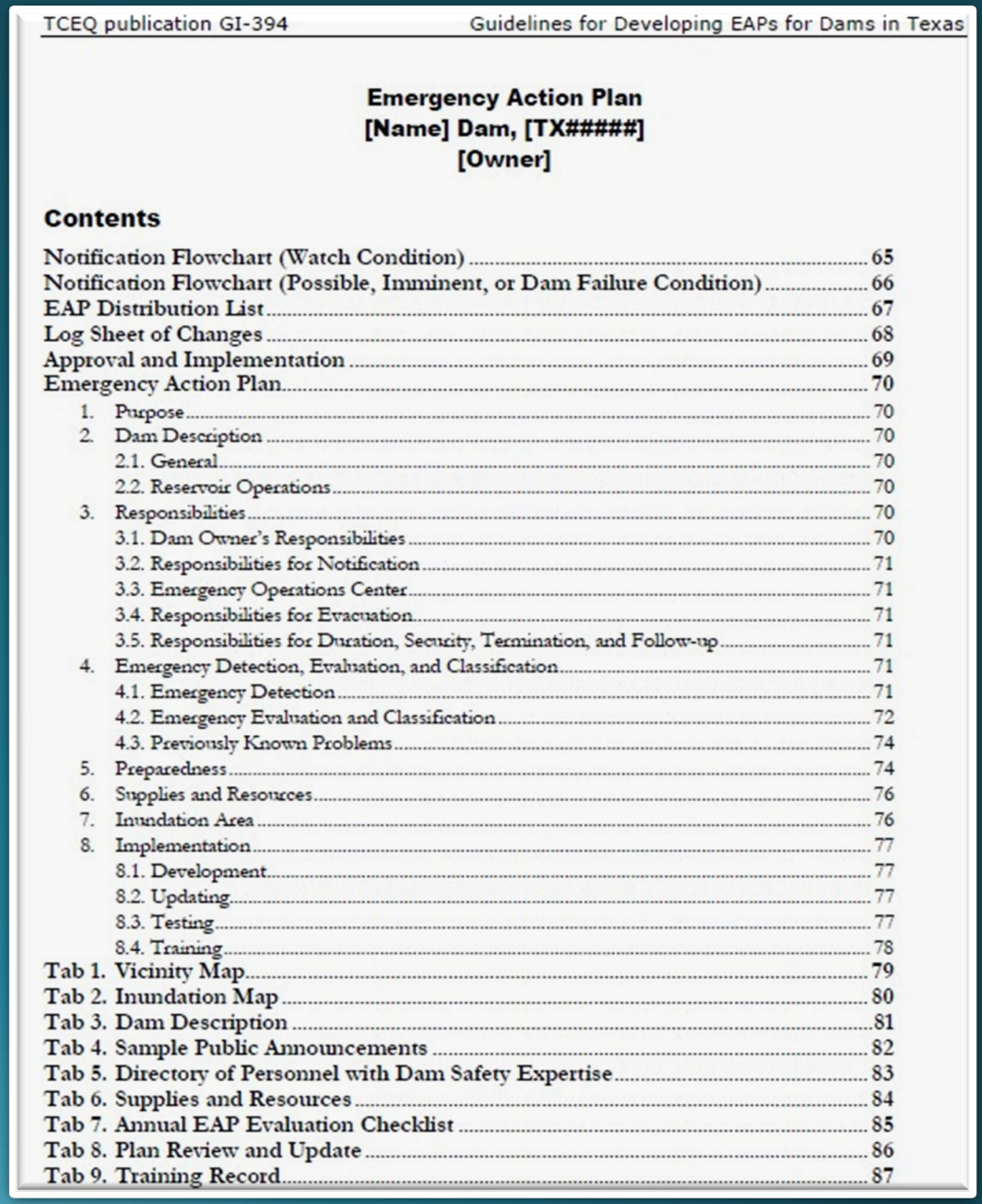
[Name]

EAP TEMPLATE

TABLE OF CONTENTS
(C31-32, D63)

Large Dam includes more sections:

- 3.6 Communications
- 6. Supplies & Resources
- 7.1 Local Evacuation Plan



Emergency Action Plan
[Name] Dam, [TX#####]
[Owner]

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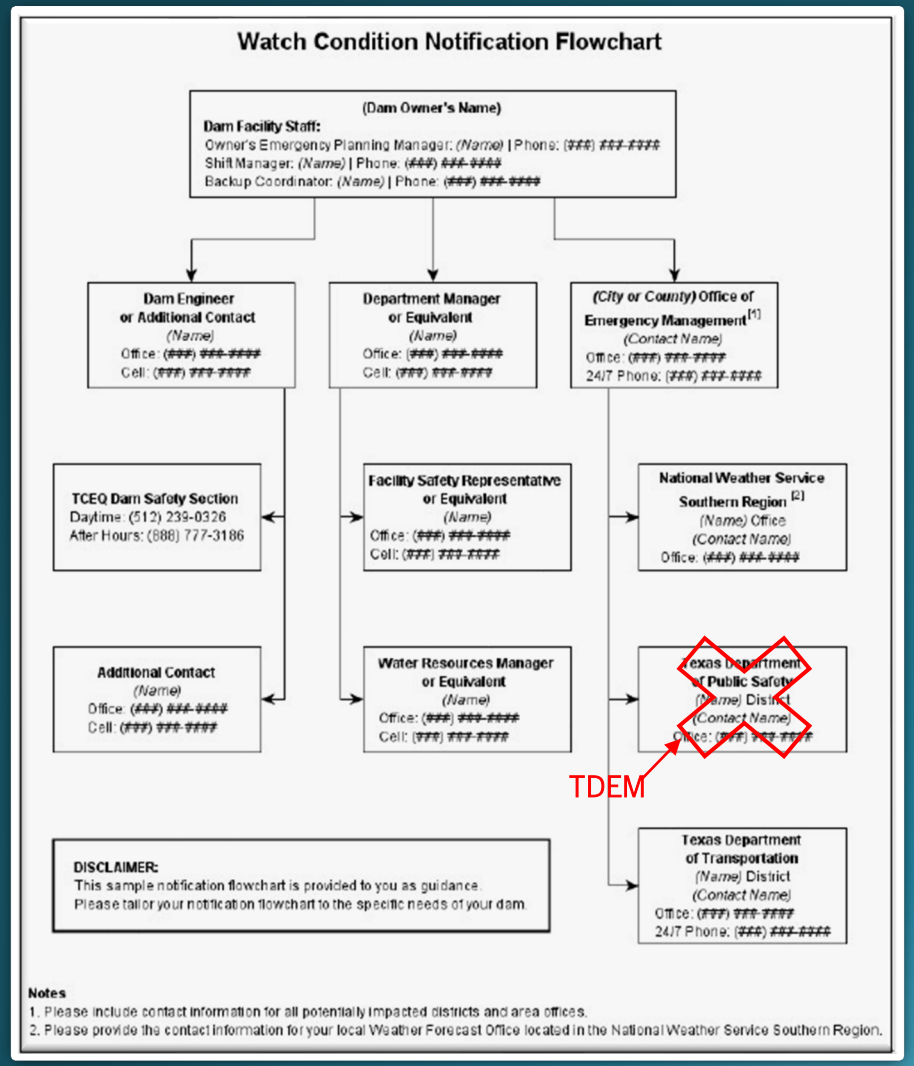
EAP TEMPLATE – WATCH CONDITION NOTIFICATION FLOWCHART

Large:
C33



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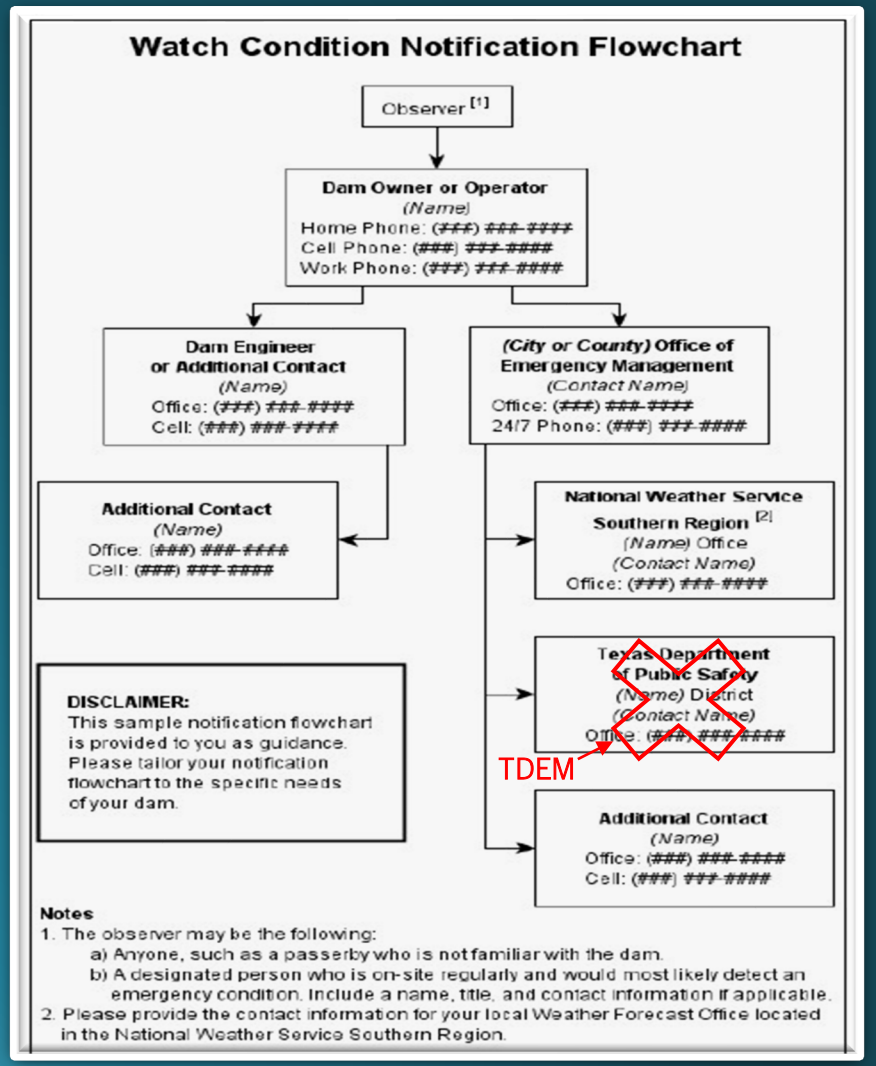
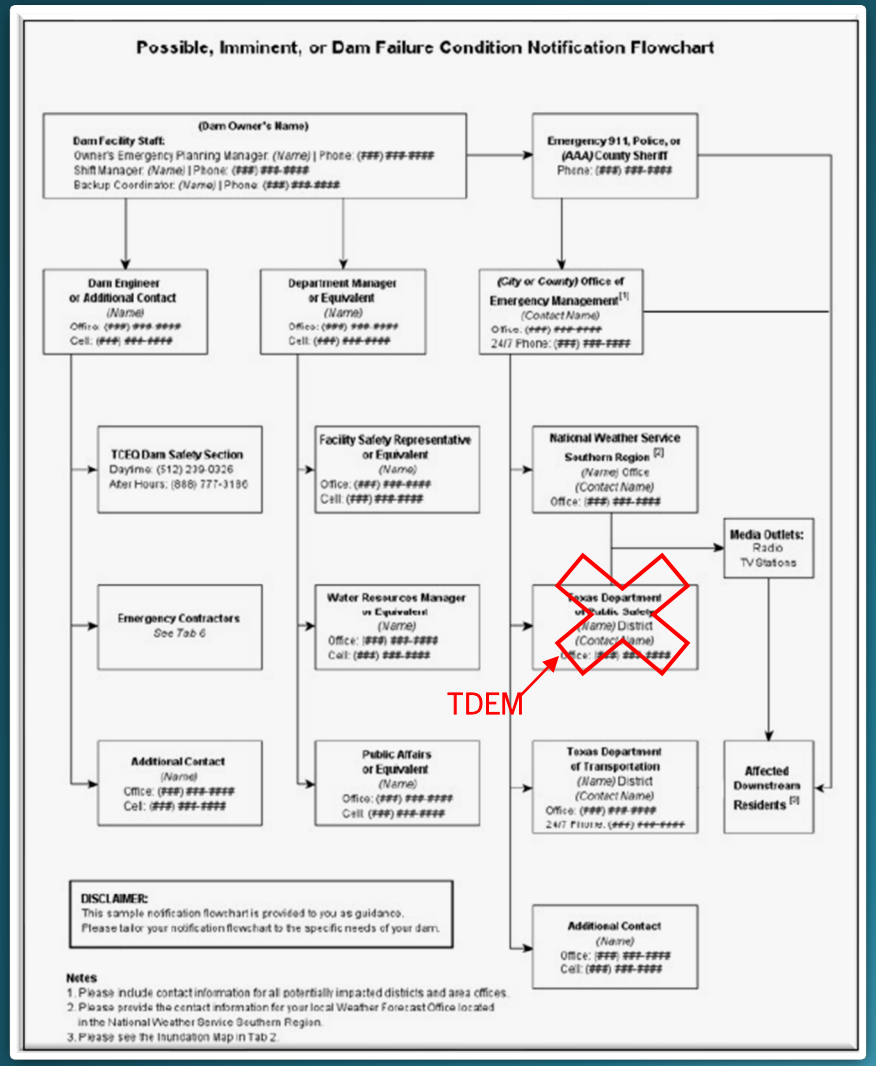
D65



EAP TEMPLATE – POSSIBLE, IMMINENT, OR DAM FAILURE CONDITION NOTIFICATION FLOWCHART

Large:
C34



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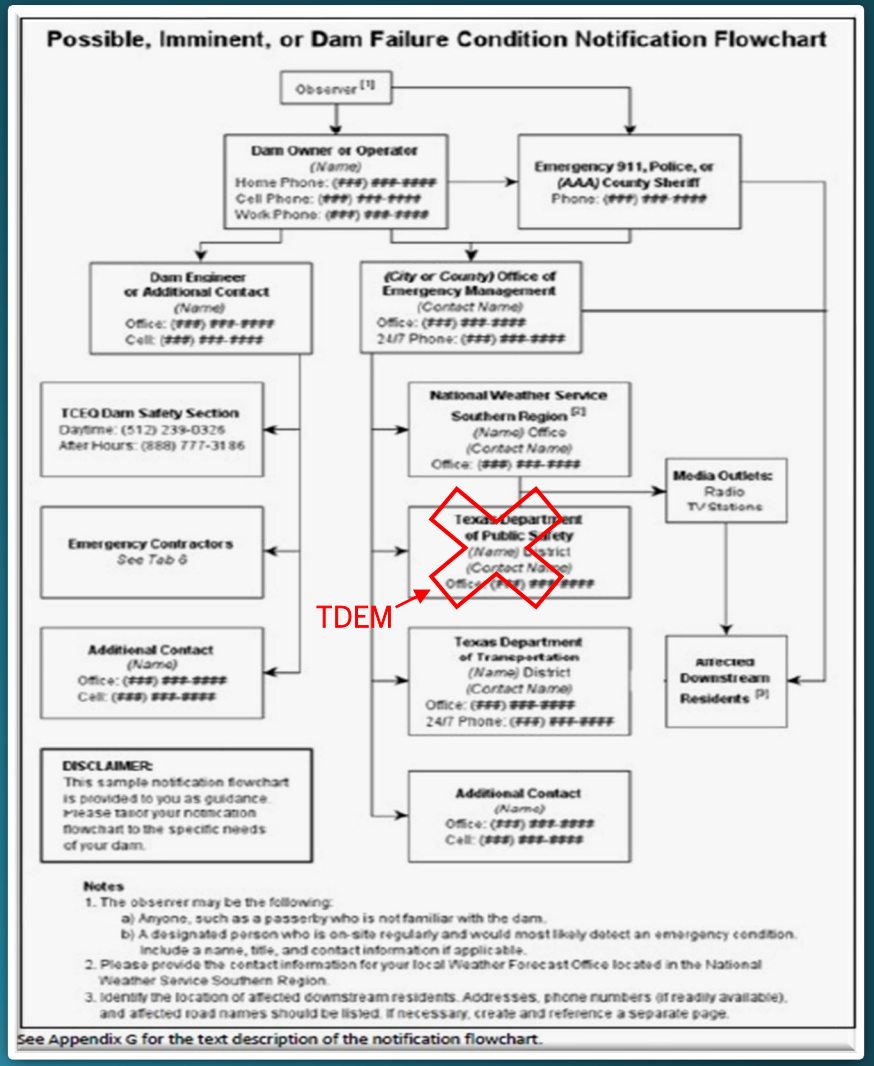
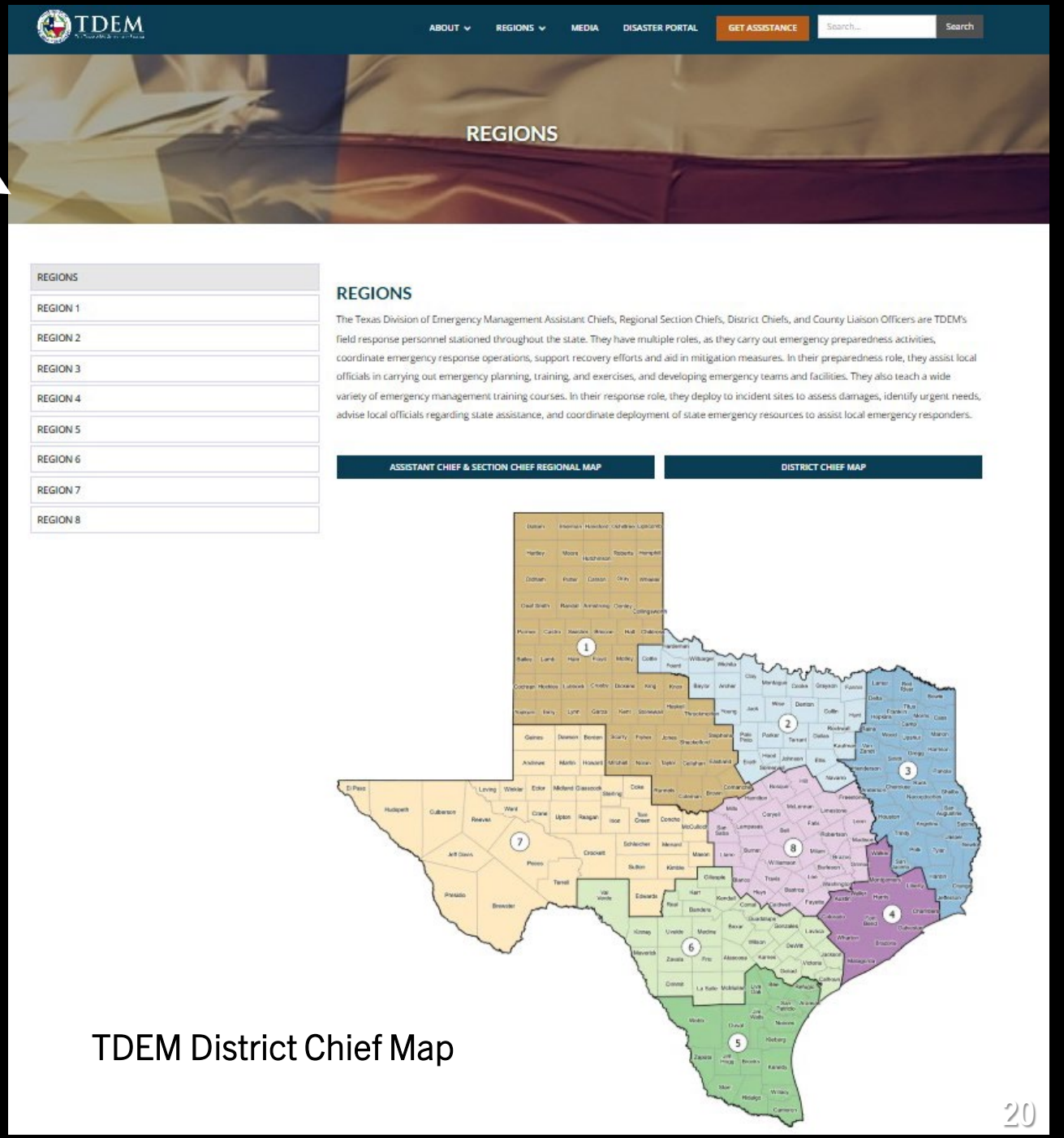
D66



https://www.tdem.texas.gov/regions

Texas Division of Emergency Management
District 7 Coordinator
Greg Goettsch
Office: 325-795-4029
Cell: 806-407-7839

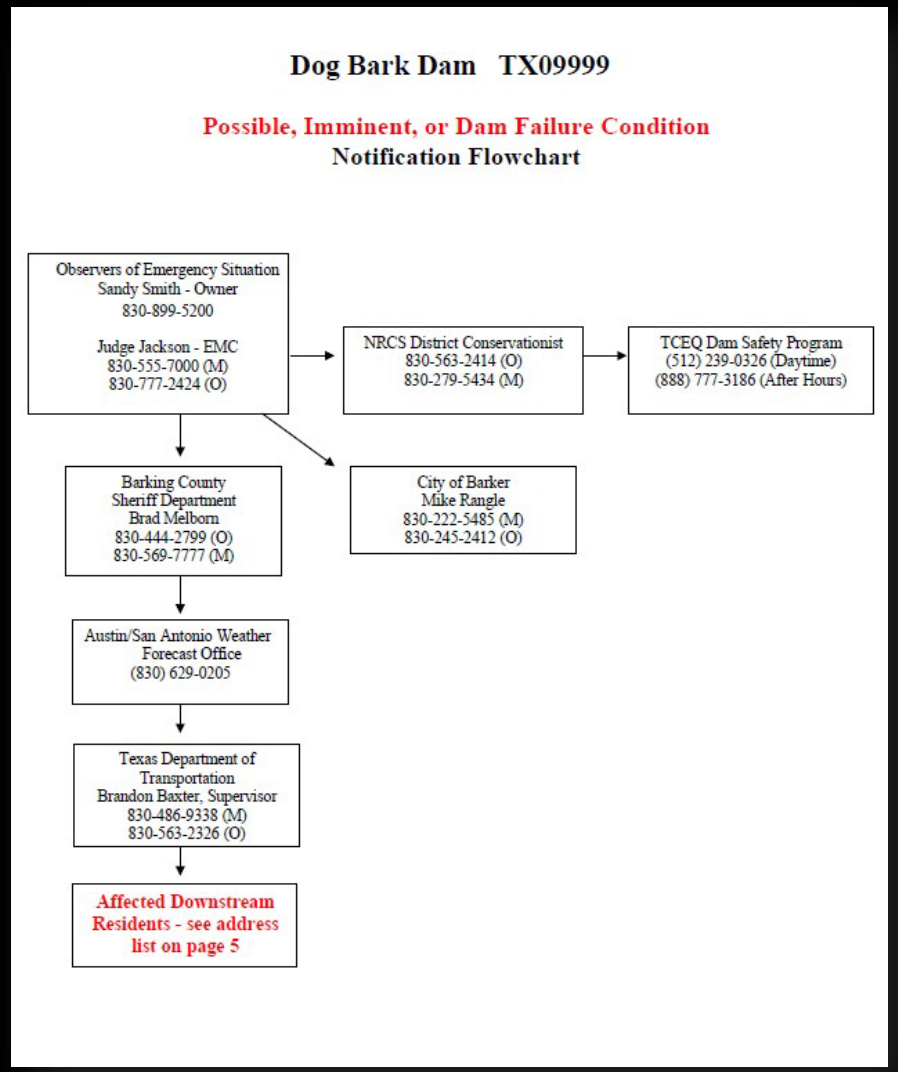
Replaces
Texas Department of Public Safety
block



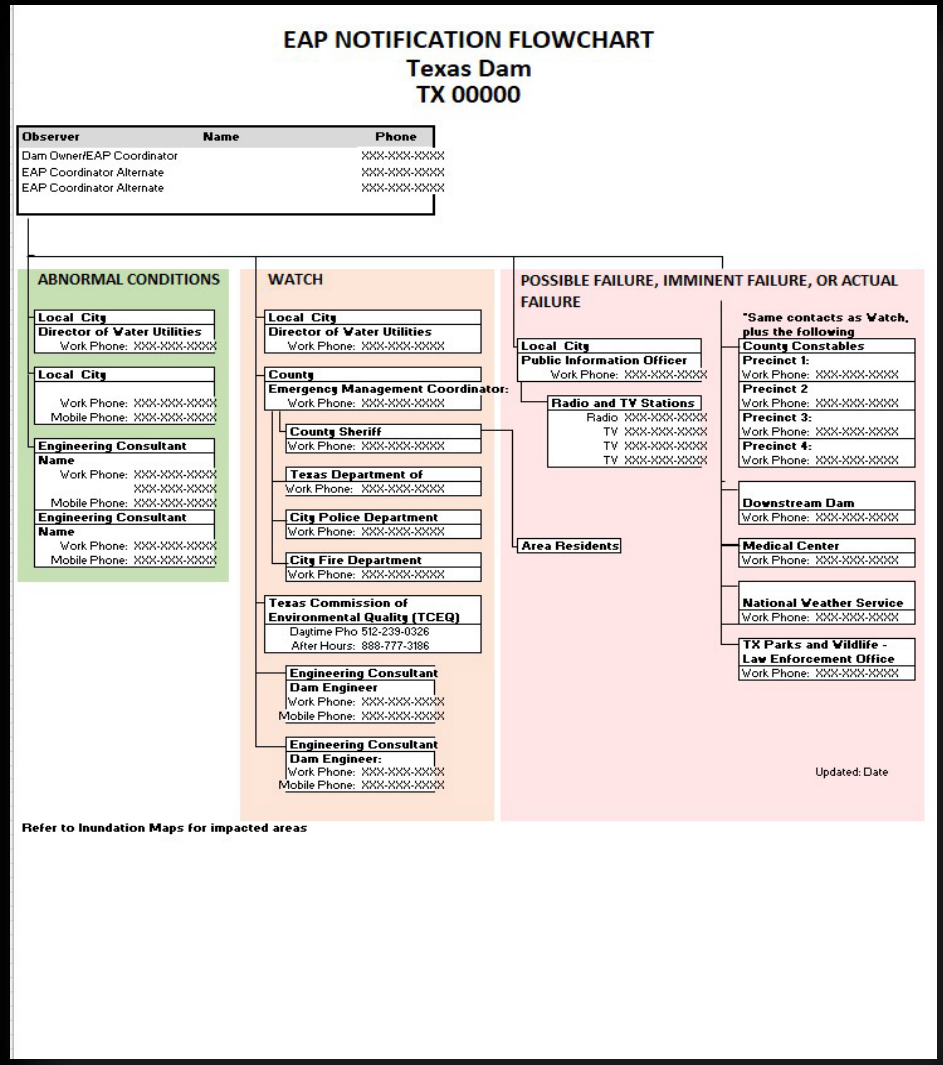
TDEM District Chief Map

NOTIFICATION FLOWCHART EXAMPLES

SMALL/INT DAM - IMMINENT

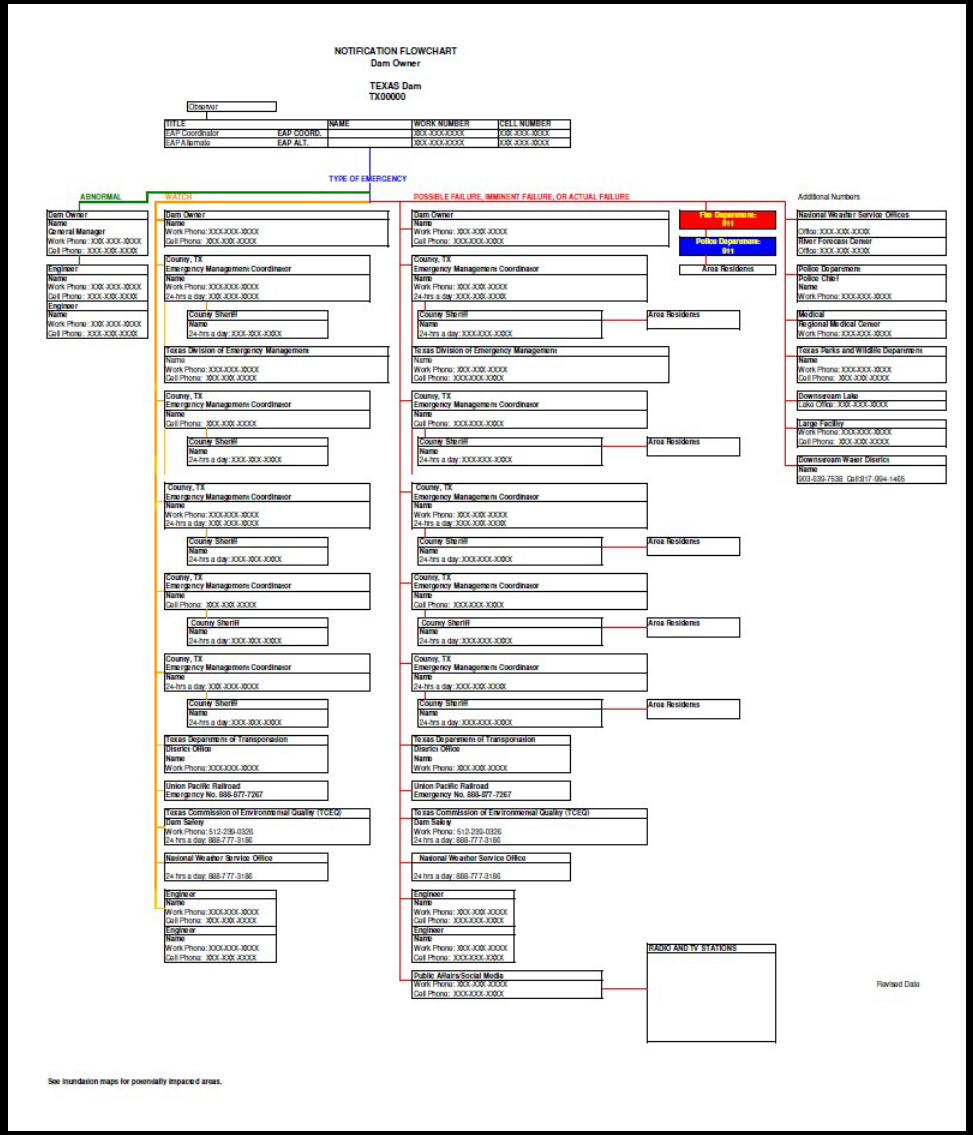


SMALL/INT DAM

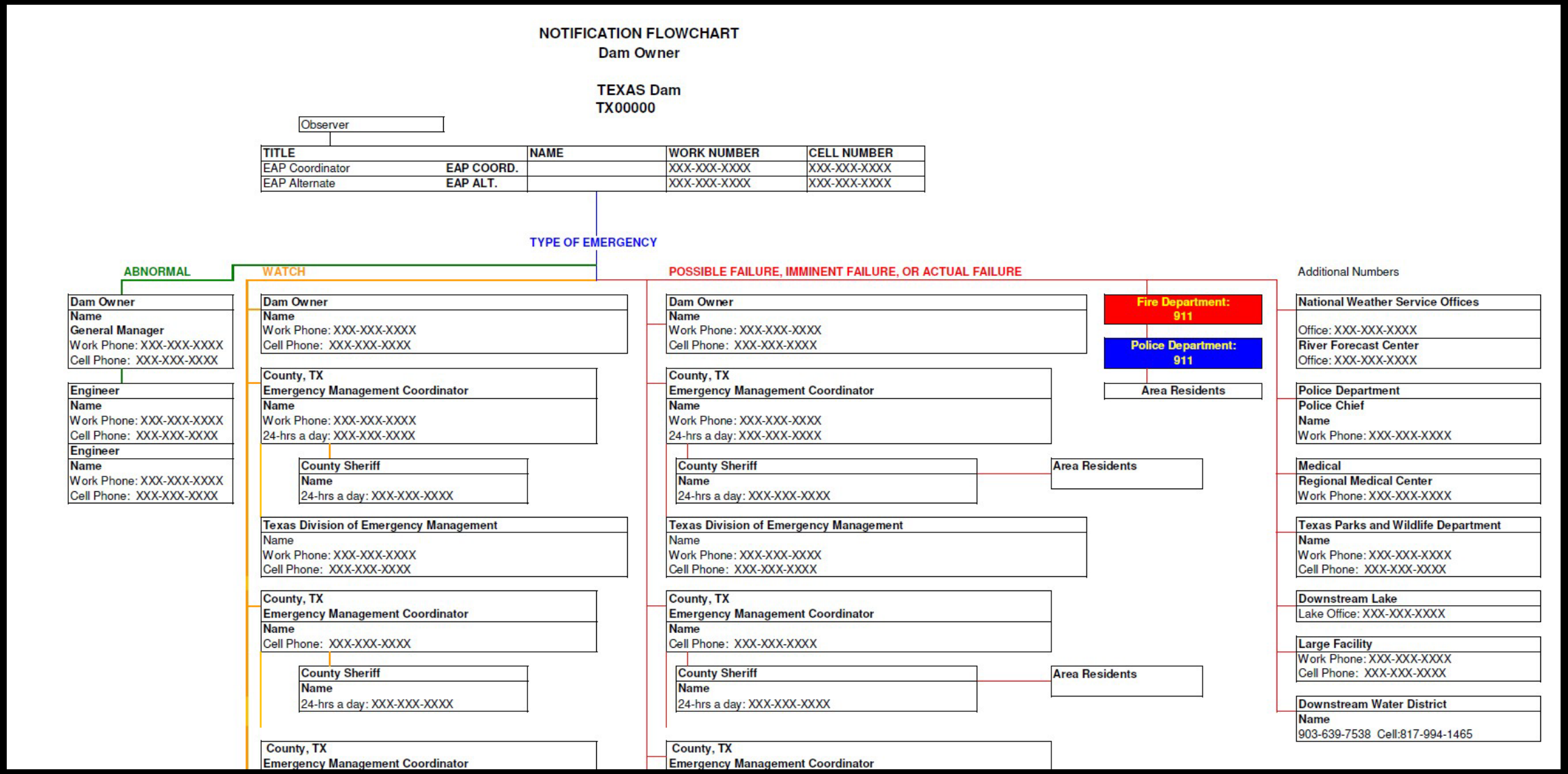


NOTIFICATION FLOWCHART EXAMPLES

BOTH WATCH & IMMINENT



NOTIFICATION FLOWCHART EXAMPLES



EAP TEMPLATE

DISTRIBUTION LIST (C35, D67)

- List all affected County EMCs

[NAME] DAM, [TX#####]

EAP DISTRIBUTION LIST

A copy of the EAP has been provided to the following individuals.

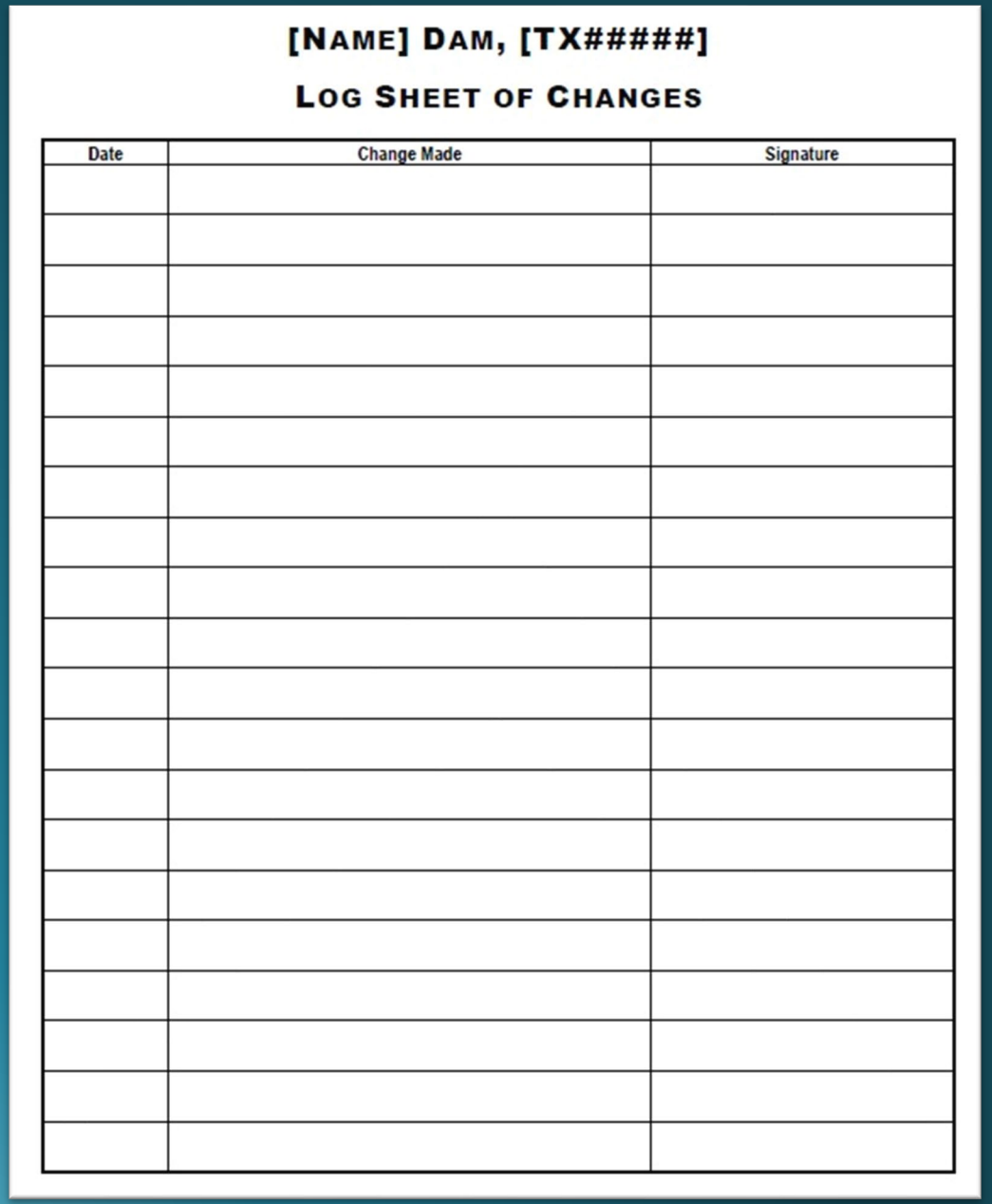
Authority	Name, Title, Phone	Address
Owner(s) and Representatives		
Office of Emergency Management [AAA County or AAA City]	Emergency Management Coordinator [Name of Contact] Phone ###-###-####	
Texas Department of Transportation District [###]	[Name of Contact] Phone ###-###-####	
Texas Commission on Environmental Quality	(512) 239-0326 (daytime) (888) 777-3186 (after hours)	Dam Safety Section, MC 177 P.O. Box 13087 Austin, TX 78711
Engineer [Company Name]	[Name of Contact] Phone ###-###-####	

EAP TEMPLATE

LOG SHEET (C36, D68)

- Annual updates only – EAP is accepted
- Owner may:
  - state that annual forms are updated and list the page numbers or state that they are updated and kept in-house

  OR
  - list page numbers that changed
  - send only the updated pages via email or letter
- A digital copy of the entire EAP is appreciated in addition to the changes



[NAME] DAM, [TX#####]

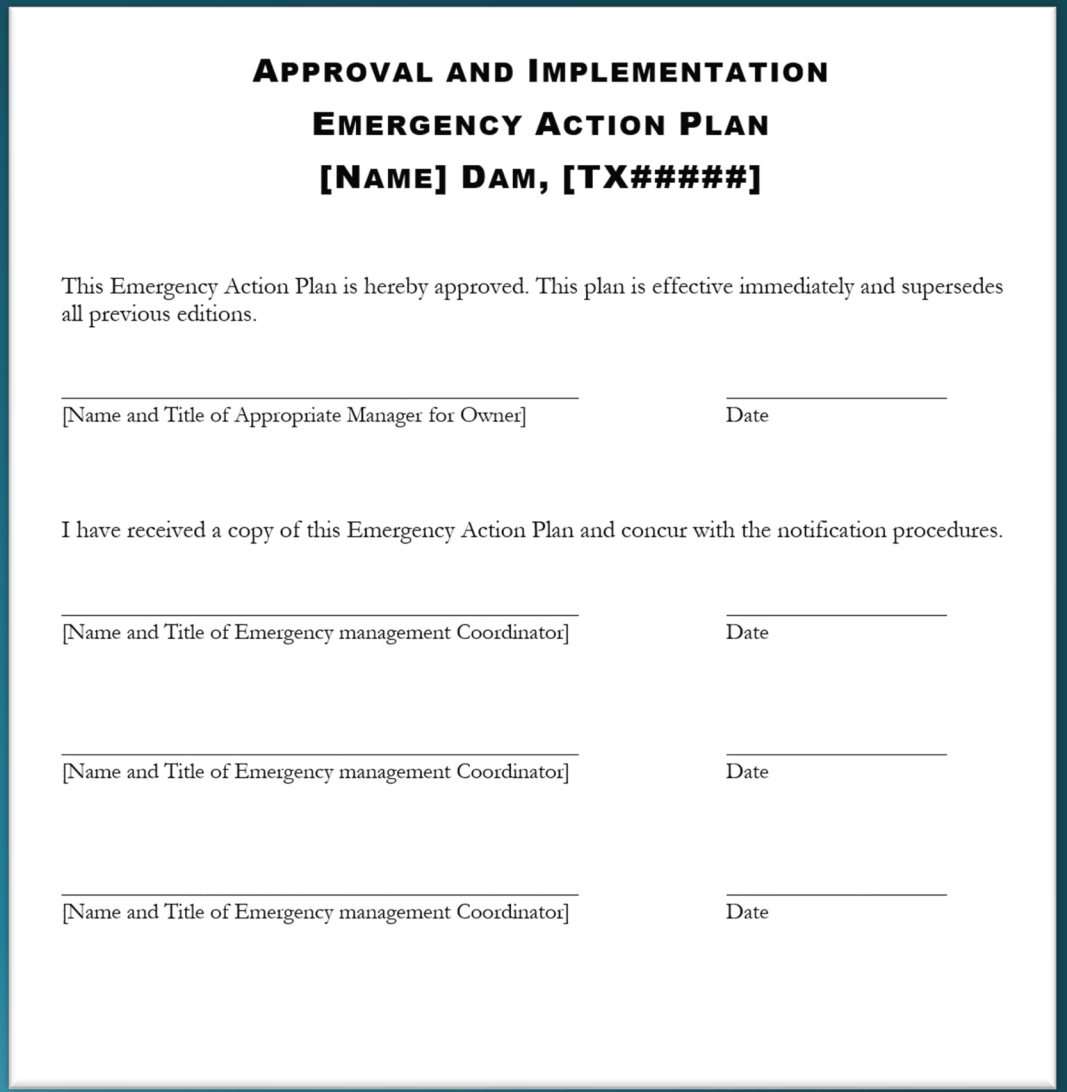
LOG SHEET OF CHANGES

Date	Change Made	Signature

EAP TEMPLATE

APPROVAL & IMPLEMENTATION (C37, D69)

- Owner and County Emergency Management Coordinator signature required
- EMCs from all counties impacted by a dam breach must sign; these can be obtained via email when EMC staff change
- Only new signatures needed when personnel changes are made



APPROVAL AND IMPLEMENTATION
EMERGENCY ACTION PLAN
[NAME] DAM, [TX#####]

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

_____ _____
[Name and Title of Appropriate Manager for Owner] Date

I have received a copy of this Emergency Action Plan and concur with the notification procedures.

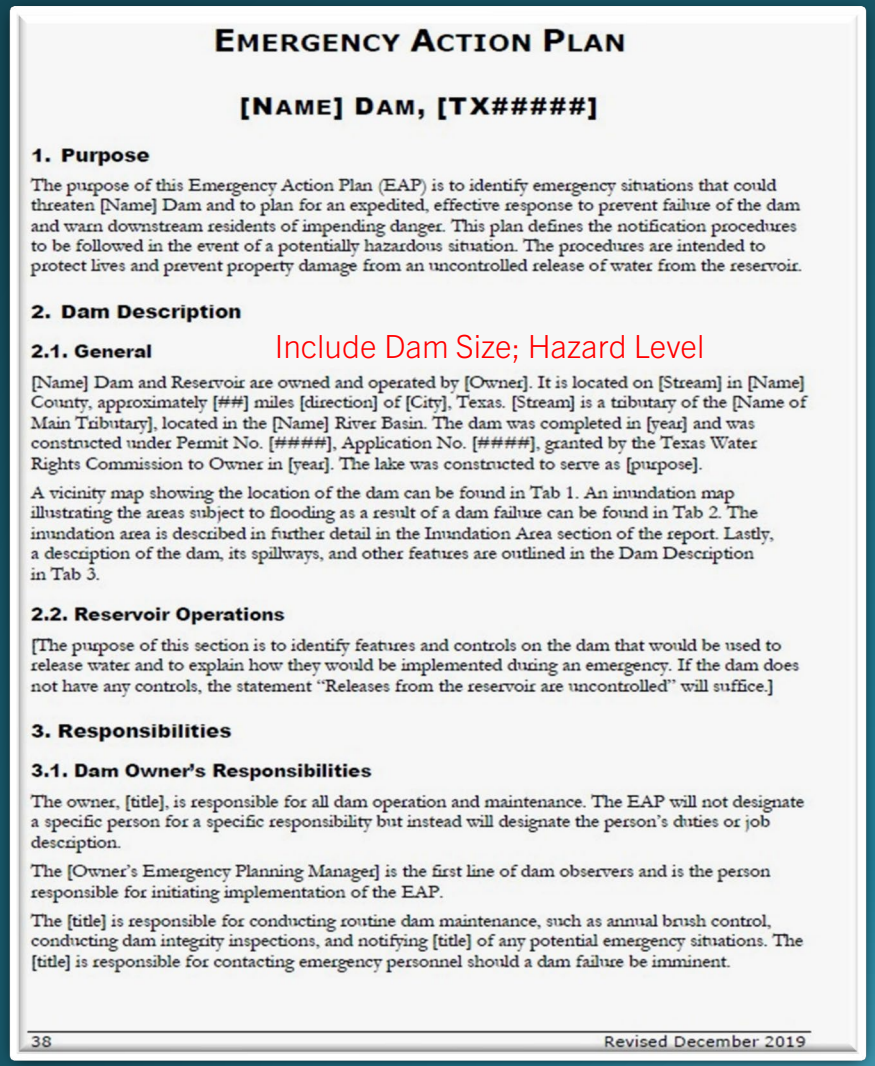
_____ _____
[Name and Title of Emergency management Coordinator] Date

_____ _____
[Name and Title of Emergency management Coordinator] Date

_____ _____
[Name and Title of Emergency management Coordinator] Date

EAP TEMPLATE – MAIN BODY

Large:
C38



EMERGENCY ACTION PLAN

[NAME] DAM, [TX#####]

1. Purpose

The purpose of this Emergency Action Plan (EAP) is to identify emergency situations that could threaten [Name] Dam and to plan for an expedited, effective response to prevent failure of the dam and warn downstream residents of impending danger. This plan defines the notification procedures to be followed in the event of a potentially hazardous situation. The procedures are intended to protect lives and prevent property damage from an uncontrolled release of water from the reservoir.

2. Dam Description

2.1. General Include Dam Size; Hazard Level

[Name] Dam and Reservoir are owned and operated by [Owner]. It is located on [Stream] in [Name] County, approximately [##] miles [direction] of [City], Texas. [Stream] is a tributary of the [Name of Main Tributary], located in the [Name] River Basin. The dam was completed in [year] and was constructed under Permit No. [#####], Application No. [#####], granted by the Texas Water Rights Commission to Owner in [year]. The lake was constructed to serve as [purpose].

A vicinity map showing the location of the dam can be found in Tab 1. An inundation map illustrating the areas subject to flooding as a result of a dam failure can be found in Tab 2. The inundation area is described in further detail in the Inundation Area section of the report. Lastly, a description of the dam, its spillways, and other features are outlined in the Dam Description in Tab 3.

2.2. Reservoir Operations

[The purpose of this section is to identify features and controls on the dam that would be used to release water and to explain how they would be implemented during an emergency. If the dam does not have any controls, the statement "Releases from the reservoir are uncontrolled" will suffice.]

3. Responsibilities

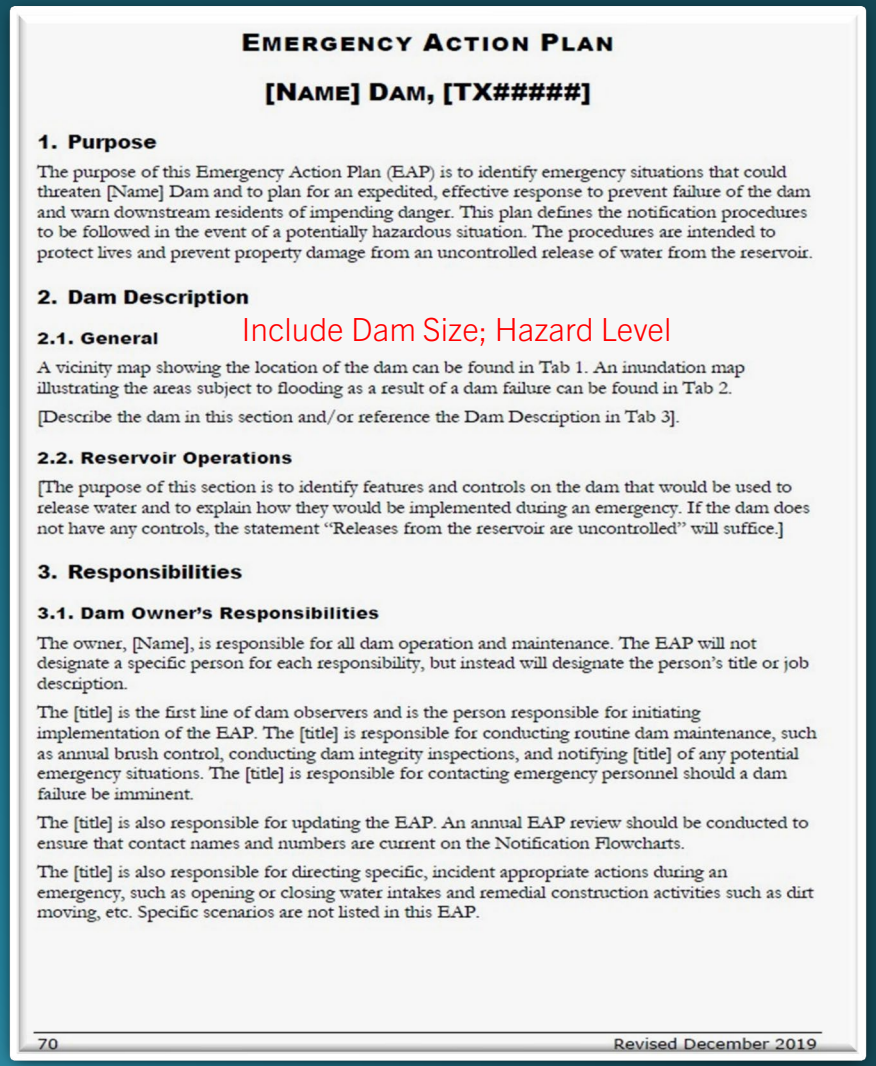
3.1. Dam Owner's Responsibilities

The owner, [title], 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 [Owner's Emergency Planning Manager] is the first line of dam observers and is the person responsible for initiating 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.

Int/Small:
D70



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[Describe the dam in this section and/or reference the Dam Description in Tab 3].

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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 Flowcharts.

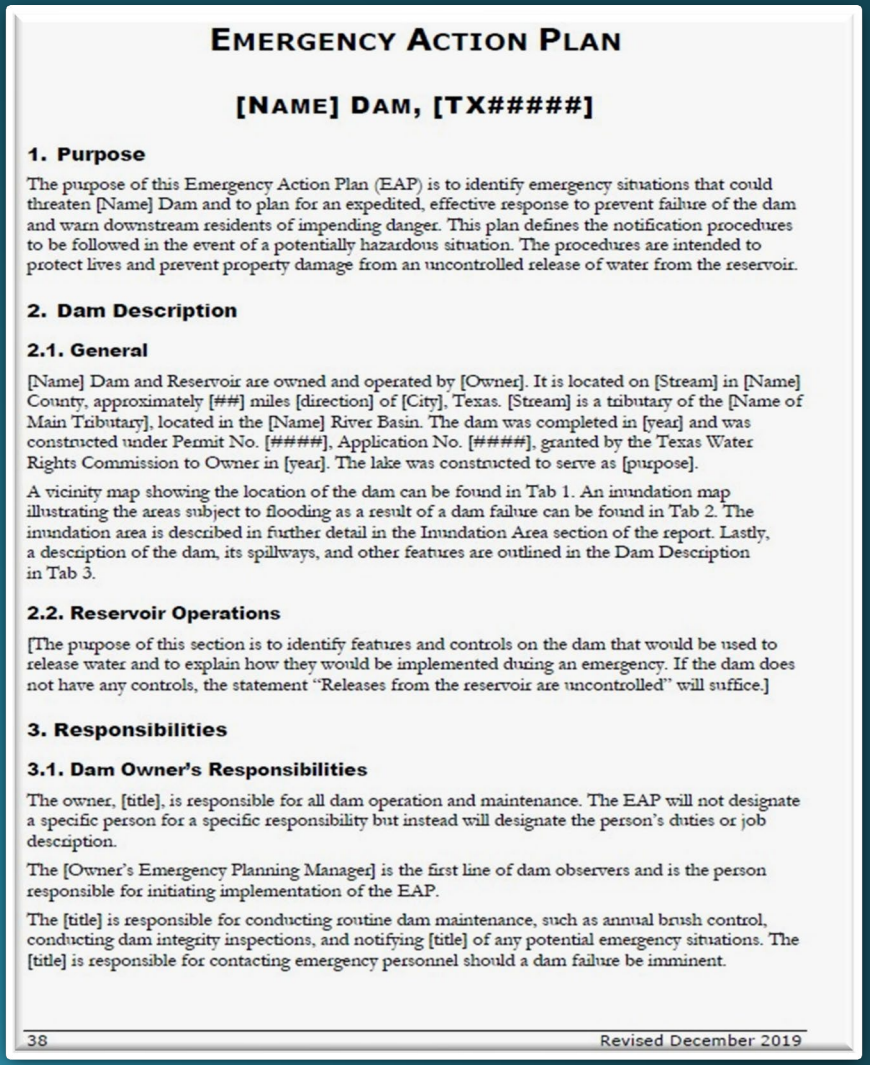
The [title] is also responsible for directing specific, incident appropriate actions during an emergency, such as opening or closing water intakes and remedial construction activities such as dirt moving, etc. Specific scenarios are not listed in this EAP.

EAP TEMPLATE – MAIN BODY - SECTIONS 1 PURPOSE AND 2 DESCRIPTION

1 – Purpose – Reason for the EAP

2 - Description – Discusses general info on dam

- Location, County, Stream, River Basin, Haz Class, Size Class
- Construction Info – date if known, type
- References Tabs 1-3 (Maps/Description)
- Water Controls – gates, valves (usually large dams)



EMERGENCY ACTION PLAN

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38 Revised December 2019

EAP TEMPLATE – MAIN BODY - SECTION 3 RESPONSIBILITIES

Responsibilities

- WHO is responsible for O&M, observation, emergency response, communication, etc.
- Notification – WHO implements Flowchart, WHO notifies residents
- Identifies location of Emergency Operations Center and WHO initiates evacuation and WHO follows-up
- 3.6 Communications (Lg) – Explains HOW residents will be notified and by WHOM

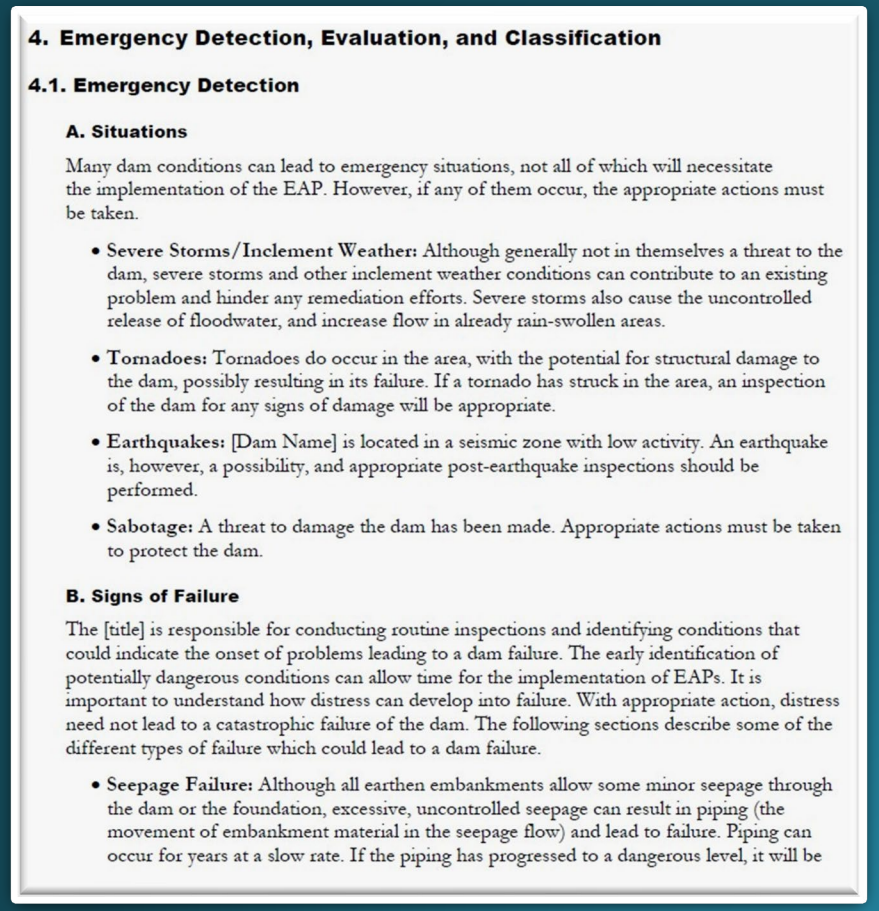
EAP TEMPLATE – MAIN BODY - SECTION 3 RESPONSIBILITIES

Responsibilities

- WHO is responsible for O&M, observation, emergency response, communication, etc.
- Notification – WHO implements Flowchart, WHO notifies residents
- Identifies location of Emergency Operations Center and WHO initiates evacuation and WHO follows-up
- 3.6 Communications (Lg) – Explains HOW residents will be notified and by WHOM

Night under the stars???

EAP TEMPLATE – MAIN BODY - SECTION 4 EMERGENCY DETECTION, EVALUATION, & CLASSIFICATION



4. Emergency Detection, Evaluation, and Classification

4.1. Emergency Detection

A. Situations

Many dam conditions can lead to emergency situations, not all of which will necessitate the implementation of the EAP. However, if any of them occur, the appropriate actions must be taken.

- **Severe Storms/Inclement Weather:** Although generally not in themselves a threat to the dam, severe storms and other inclement weather conditions can contribute to an existing problem and hinder any remediation efforts. Severe storms also cause the uncontrolled release of floodwater, and increase flow in already rain-swollen areas.
- **Tornadoes:** Tornadoes do occur in the area, with the potential for structural damage to the dam, possibly resulting in its failure. If a tornado has struck in the area, an inspection of the dam for any signs of damage will be appropriate.
- **Earthquakes:** [Dam Name] is located in a seismic zone with low activity. An earthquake is, however, a possibility, and appropriate post-earthquake inspections should be performed.
- **Sabotage:** A threat to damage the dam has been made. Appropriate actions must be taken to protect the dam.

B. Signs of Failure

The [title] is responsible for conducting routine inspections and identifying conditions that could indicate the onset of problems leading to a dam failure. The early identification of potentially dangerous conditions can allow time for the implementation of EAPs. It is important to understand how distress can develop into failure. With appropriate action, distress need not lead to a catastrophic failure of the dam. The following sections describe some of the different types of failure which could lead to a dam failure.

- **Seepage Failure:** Although all earthen embankments allow some minor seepage through the dam or the foundation, excessive, uncontrolled seepage can result in piping (the movement of embankment material in the seepage flow) and lead to failure. Piping can occur for years at a slow rate. If the piping has progressed to a dangerous level, it will be

4.1 Emergency Detection

- Situations – Storms, Tornadoes, Sabotage, etc
- Signs of Failure - Seepage, Sliding, Structural, or Overtopping

4.2 Emergency Evaluation & Classification

- Watch Condition
- Possible Dam Failure Condition
- Imminent Dam Failure Condition

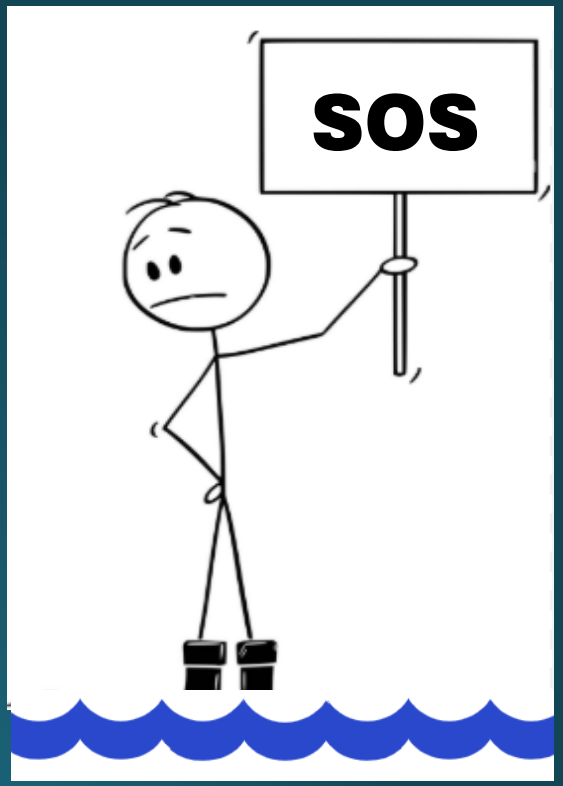
4.3 Previously Known Problems

HOW QUICKLY THINGS CAN CHANGE!

May 20, 2024

June 5, 2024

EAP TEMPLATE – MAIN BODY - SECTION 5 PREPAREDNESS



Individuals Responsible

- Surveillance
- Response during weekends, holidays, adverse weather, access to the site

Large Dams (Section 4.2 refers to Tab 5 – Evidence of Distress)

- Watch Condition
- Possible Dam Failure Condition
- Imminent Dam Failure Condition

Small/Int Dams (refers to Tab 5 – Directory of Personnel w Dam Expertise)

- Overtopping by flood waters
- A slide on the upstream or downstream slope of the embankment
- Erosional seepage or leakage (piping)
- Etc.

EAP TEMPLATE – MAIN BODY - SECTION 5 PREPAREDNESS

Can tailor these as necessary to fit your dam situation

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.

EAP TEMPLATE – MAIN BODY - SECTION 6 SUPPLIES AND RESOURCES

Identifies the supplies and resources available for remedial/ emergency actions

Int/Small Dams (refer to Tab 6)

- Support Organizations
- Location of supplies/equipment
- Procedures for procurement of supplies

Large Dams (in addition to above)

- Contracts with other organizations
- Technical records
- EOC Activity Log
- Costs

EAP TEMPLATE – MAIN BODY – SECTION 7 INUNDATION AREA

<u>All Dams</u>

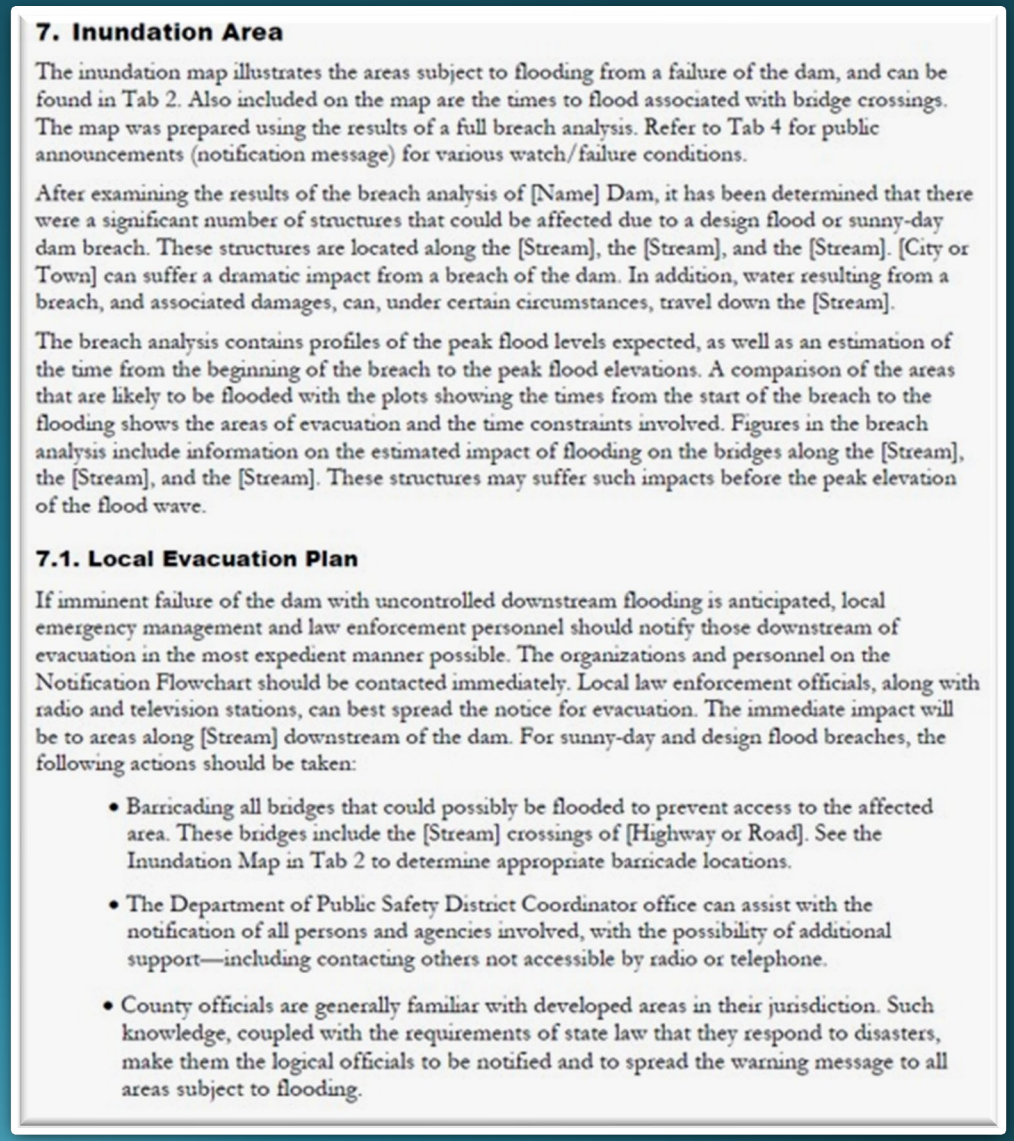
Inundation Area (map in Tab 2)

- List potential hazards of a dam failure
  - Residences
  - Roadways
  - Public facilities
- Breach analysis results – date, engineer, type, etc. (if analysis is necessary)

<u>Large Dams (7.1 Local Evacuation Plan)</u>

Evacuation Plan

- Barricades necessary, evacuation routes
- TDEM (not DPS) assistance
- Location of shelter



7. Inundation Area

The inundation map illustrates the areas subject to flooding from a failure of the dam, and can be found in Tab 2. Also included on the map are the times to flood associated with bridge crossings. The map was prepared using the results of a full breach analysis. Refer to Tab 4 for public announcements (notification message) for various watch/failure conditions.

After examining the results of the breach analysis of [Name] Dam, it has been determined that there were a significant number of structures that could be affected due to a design flood or sunny-day dam breach. These structures are located along the [Stream], the [Stream], and the [Stream]. [City or Town] can suffer a dramatic impact from a breach of the dam. In addition, water resulting from a breach, and associated damages, can, under certain circumstances, travel down the [Stream].

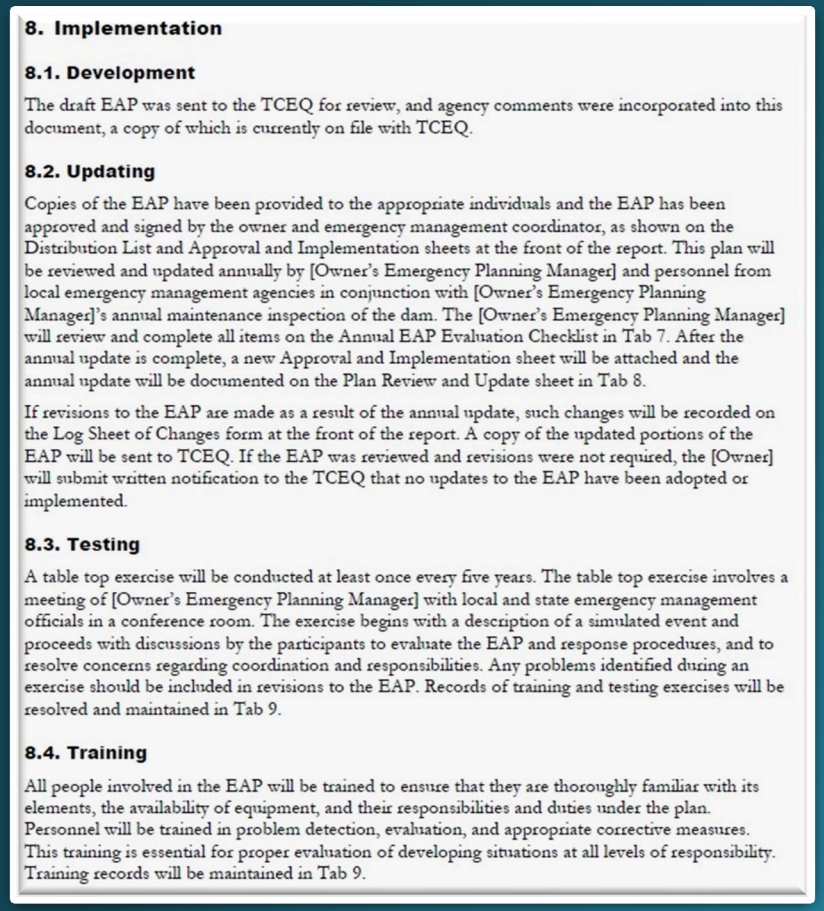
The breach analysis contains profiles of the peak flood levels expected, as well as an estimation of the time from the beginning of the breach to the peak flood elevations. A comparison of the areas that are likely to be flooded with the plots showing the times from the start of the breach to the flooding shows the areas of evacuation and the time constraints involved. Figures in the breach analysis include information on the estimated impact of flooding on the bridges along the [Stream], the [Stream], and the [Stream]. These structures may suffer such impacts before the peak elevation of the flood wave.

7.1. Local Evacuation Plan

If imminent failure of the dam with uncontrolled downstream flooding is anticipated, local emergency management and law enforcement personnel should notify those downstream of evacuation in the most expedient manner possible. The organizations and personnel on the Notification Flowchart should be contacted immediately. Local law enforcement officials, along with radio and television stations, can best spread the notice for evacuation. The immediate impact will be to areas along [Stream] downstream of the dam. For sunny-day and design flood breaches, the following actions should be taken:

- Barricading all bridges that could possibly be flooded to prevent access to the affected area. These bridges include the [Stream] crossings of [Highway or Road]. See the Inundation Map in Tab 2 to determine appropriate barricade locations.
- The Department of Public Safety District Coordinator office can assist with the notification of all persons and agencies involved, with the possibility of additional support—including contacting others not accessible by radio or telephone.
- County officials are generally familiar with developed areas in their jurisdiction. Such knowledge, coupled with the requirements of state law that they respond to disasters, make them the logical officials to be notified and to spread the warning message to all areas subject to flooding.

EAP TEMPLATE – MAIN BODY - SECTION 8 IMPLEMENTATION



8. Implementation

8.1. Development

The draft EAP was sent to the TCEQ for review, and agency comments were incorporated into this document, a copy of which is currently on file with TCEQ.

8.2. Updating

Copies of the EAP have been provided to the appropriate individuals and the EAP has been approved and signed by the owner and emergency management coordinator, as shown on the Distribution List and Approval and Implementation sheets at the front of the report. This plan will be reviewed and updated annually by [Owner's Emergency Planning Manager] and personnel from local emergency management agencies in conjunction with [Owner's Emergency Planning Manager]'s annual maintenance inspection of the dam. The [Owner's Emergency Planning Manager] will review and complete all items on the Annual EAP Evaluation Checklist in Tab 7. After the annual update is complete, a new Approval and Implementation sheet will be attached and the annual update will be documented on the Plan Review and Update sheet in Tab 8.

If revisions to the EAP are made as a result of the annual update, such changes will be recorded on the Log Sheet of Changes form at the front of the report. A copy of the updated portions of the EAP will be sent to TCEQ. If the EAP was reviewed and revisions were not required, the [Owner] will submit written notification to the TCEQ that no updates to the EAP have been adopted or implemented.

8.3. Testing

A table top exercise will be conducted at least once every five years. The table top exercise involves a meeting of [Owner's Emergency Planning Manager] with local and state 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 testing exercises will be resolved and maintained in Tab 9.

8.4. Training

All people involved in the EAP will 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 will 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. Training records will be maintained in Tab 9.

8.1 Development – when EAP drafted, when accepted

8.2 Updating

- Who is approving the EAP (titles)
- Explain annual updates of EAP
- Explain revisions to the EAP

8.3 Testing – discuss Tabletop Exercises

8.4 Training

EAP TEMPLATE – TAB 1 - VICINITY MAP

Large:
C47

Int/Small:
D79

TAB 1
VICINITY MAP

The purpose of the vicinity map is to show the location of the dam and surrounding roads that provide access to the dam. USGS topographic maps, county road maps, city street maps, or free internet mapping applications such as Google Maps, Bing, Yahoo, or Map Quest can be used to produce the vicinity map. An example is shown below.

The vicinity map must include the following features:

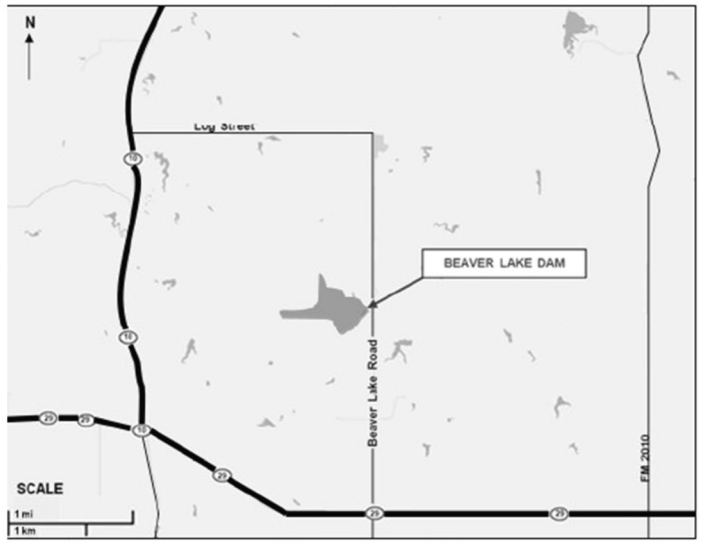
a. Show the location of the dam in relation to major roads (highways, farm to market, coun roads, etc.), intersections, and landmarks in the area.

b. Label all applicable street names.

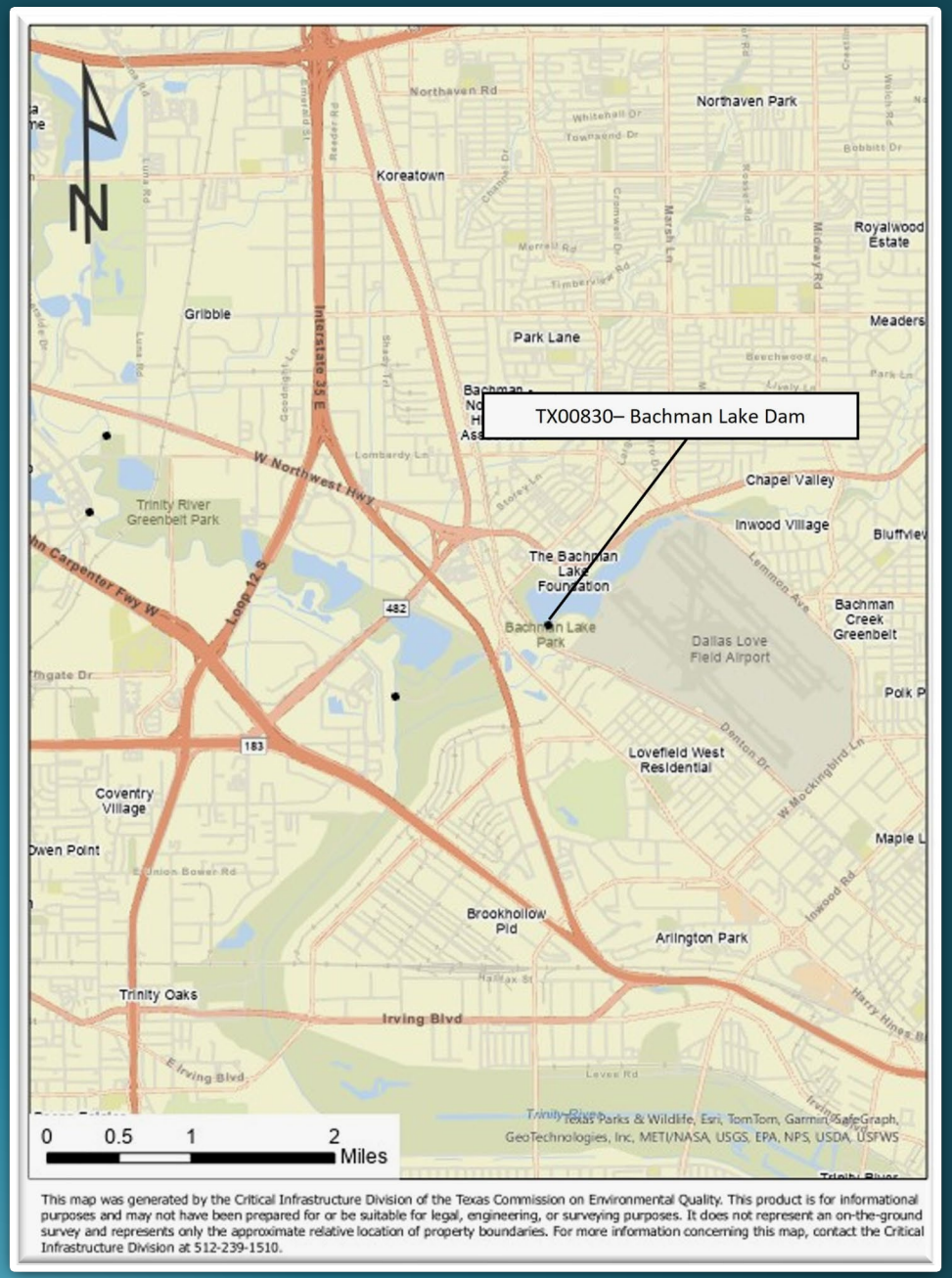
c. Label the dam.

d. Include a north arrow.

e. Scale the map appropriately to ensure all applicable features are visible. Include a scale bar.



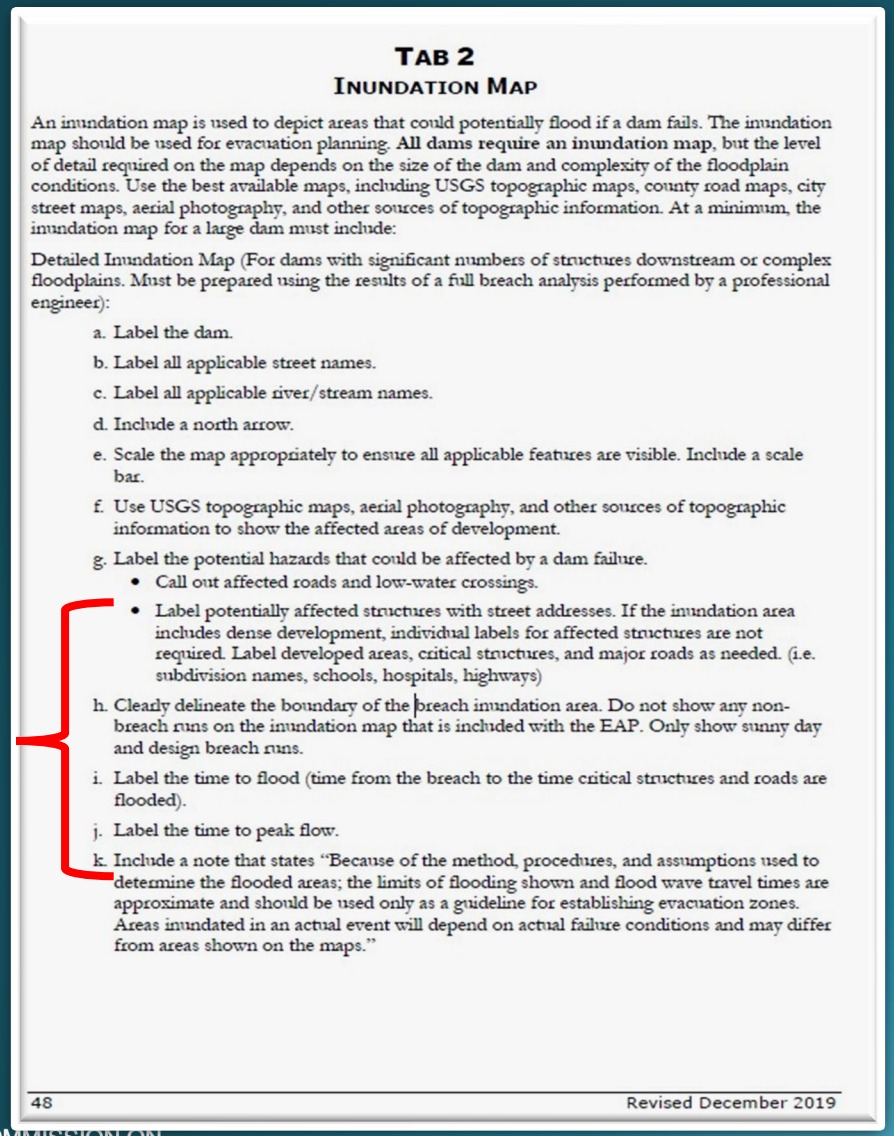
Example - Vicinity Map



This map was generated by the Critical Infrastructure Division of the Texas Commission on Environmental Quality. This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. For more information concerning this map, contact the Critical Infrastructure Division at 512-239-1510.

EAP TEMPLATE – TAB 2 – INUNDATION MAP

Large:
C48



TAB 2
INUNDATION MAP

An inundation map is used to depict areas that could potentially flood if a dam fails. The inundation map should be used for evacuation planning. **All dams require an inundation map**, but the level of detail required on the map depends on the size of the dam and complexity of the floodplain conditions. Use the best available maps, including USGS topographic maps, county road maps, city street maps, aerial photography, and other sources of topographic information. At a minimum, the inundation map for a large dam must include:

Detailed Inundation Map (For dams with significant numbers of structures downstream or complex floodplains. Must be prepared using the results of a full breach analysis performed by a professional engineer):

a. Label the dam.

b. Label all applicable street names.

c. Label all applicable river/stream names.

d. Include a north arrow.

e. Scale the map appropriately to ensure all applicable features are visible. Include a scale bar.

f. Use USGS topographic maps, aerial photography, and other sources of topographic information to show the affected areas of development.

g. Label the potential hazards that could be affected by a dam failure.
- Call out affected roads and low-water crossings.
- Label potentially affected structures with street addresses. If the inundation area includes dense development, individual labels for affected structures are not required. Label developed areas, critical structures, and major roads as needed. (i.e. subdivision names, schools, hospitals, highways)

h. Clearly delineate the boundary of the breach inundation area. Do not show any non-breach runs on the inundation map that is included with the EAP. Only show sunny day and design breach runs.

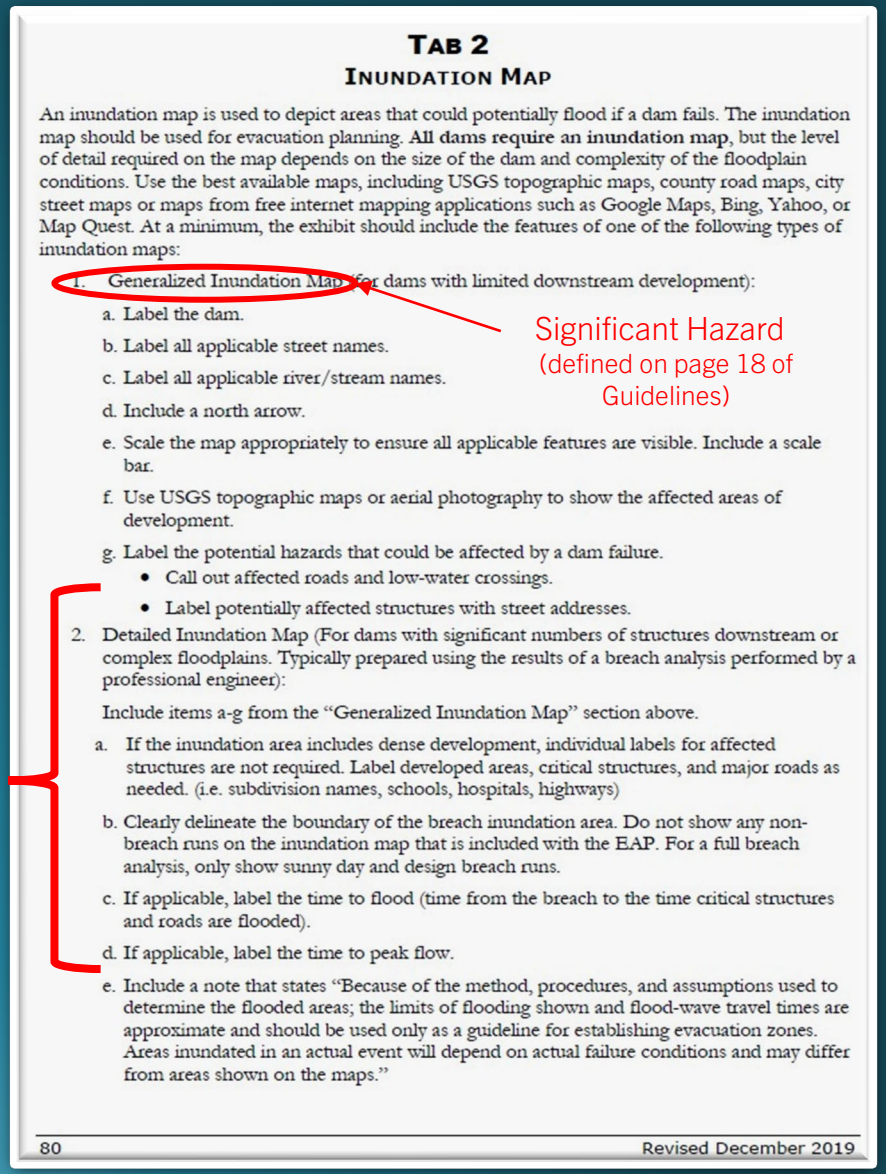
i. Label the time to flood (time from the breach to the time critical structures and roads are flooded).

j. Label the time to peak flow.

k. Include a note that states "Because of the method, procedures, and assumptions used to determine the flooded areas; the limits of flooding shown and flood wave travel times are approximate and should be used only as a guideline for establishing evacuation zones. Areas inundated in an actual event will depend on actual failure conditions and may differ from areas shown on the maps."

48 Revised December 2019

Int/Small:
D80



TAB 2
INUNDATION MAP

An inundation map is used to depict areas that could potentially flood if a dam fails. The inundation map should be used for evacuation planning. **All dams require an inundation map**, but the level of detail required on the map depends on the size of the dam and complexity of the floodplain conditions. Use the best available maps, including USGS topographic maps, county road maps, city street maps or maps from free internet mapping applications such as Google Maps, Bing, Yahoo, or Map Quest. At a minimum, the exhibit should include the features of one of the following types of inundation maps:

1. Generalized Inundation Map (for dams with limited downstream development):

a. Label the dam.

b. Label all applicable street names.

c. Label all applicable river/stream names.

d. Include a north arrow.

e. Scale the map appropriately to ensure all applicable features are visible. Include a scale bar.

f. Use USGS topographic maps or aerial photography to show the affected areas of development.

g. Label the potential hazards that could be affected by a dam failure.
- Call out affected roads and low-water crossings.
- Label potentially affected structures with street addresses.

2. Detailed Inundation Map (For dams with significant numbers of structures downstream or complex floodplains. Typically prepared using the results of a breach analysis performed by a professional engineer):

Include items a-g from the "Generalized Inundation Map" section above.

a. If the inundation area includes dense development, individual labels for affected structures are not required. Label developed areas, critical structures, and major roads as needed. (i.e. subdivision names, schools, hospitals, highways)

b. Clearly delineate the boundary of the breach inundation area. Do not show any non-breach runs on the inundation map that is included with the EAP. For a full breach analysis, only show sunny day and design breach runs.

c. If applicable, label the time to flood (time from the breach to the time critical structures and roads are flooded).

d. If applicable, label the time to peak flow.

e. Include a note that states "Because of the method, procedures, and assumptions used to determine the flooded areas; the limits of flooding shown and flood-wave travel times are approximate and should be used only as a guideline for establishing evacuation zones. Areas inundated in an actual event will depend on actual failure conditions and may differ from areas shown on the maps."

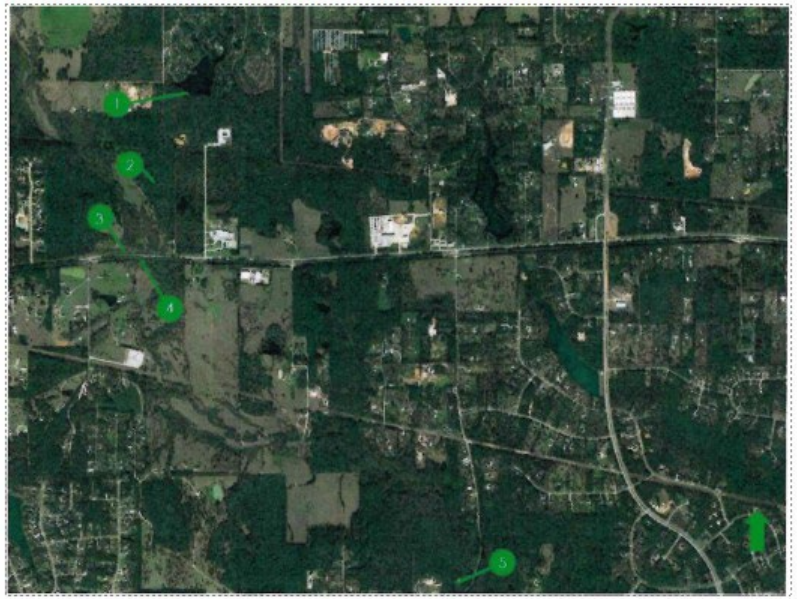
80 Revised December 2019

Significant Hazard
(defined on page 18 of Guidelines)

EMERGENCY ACTION PLANS – GENERALIZED MAP EXAMPLES

Aerial map

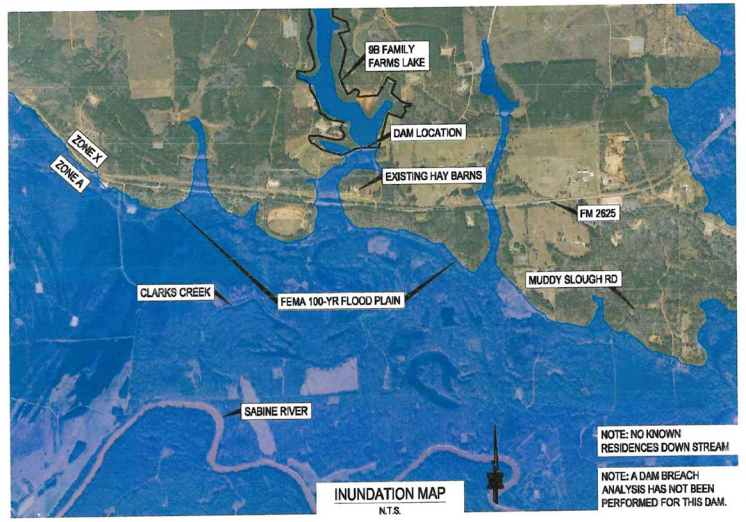
The following map is an aerial view of the inundation area downstream of Lake Bonanza.



Item	Description
1	Lake Kittycat Dam
2	Tributary of Meow Creek
3	Texas FM285 Road
4	BNSF Railroad
5	Texas Honey Road

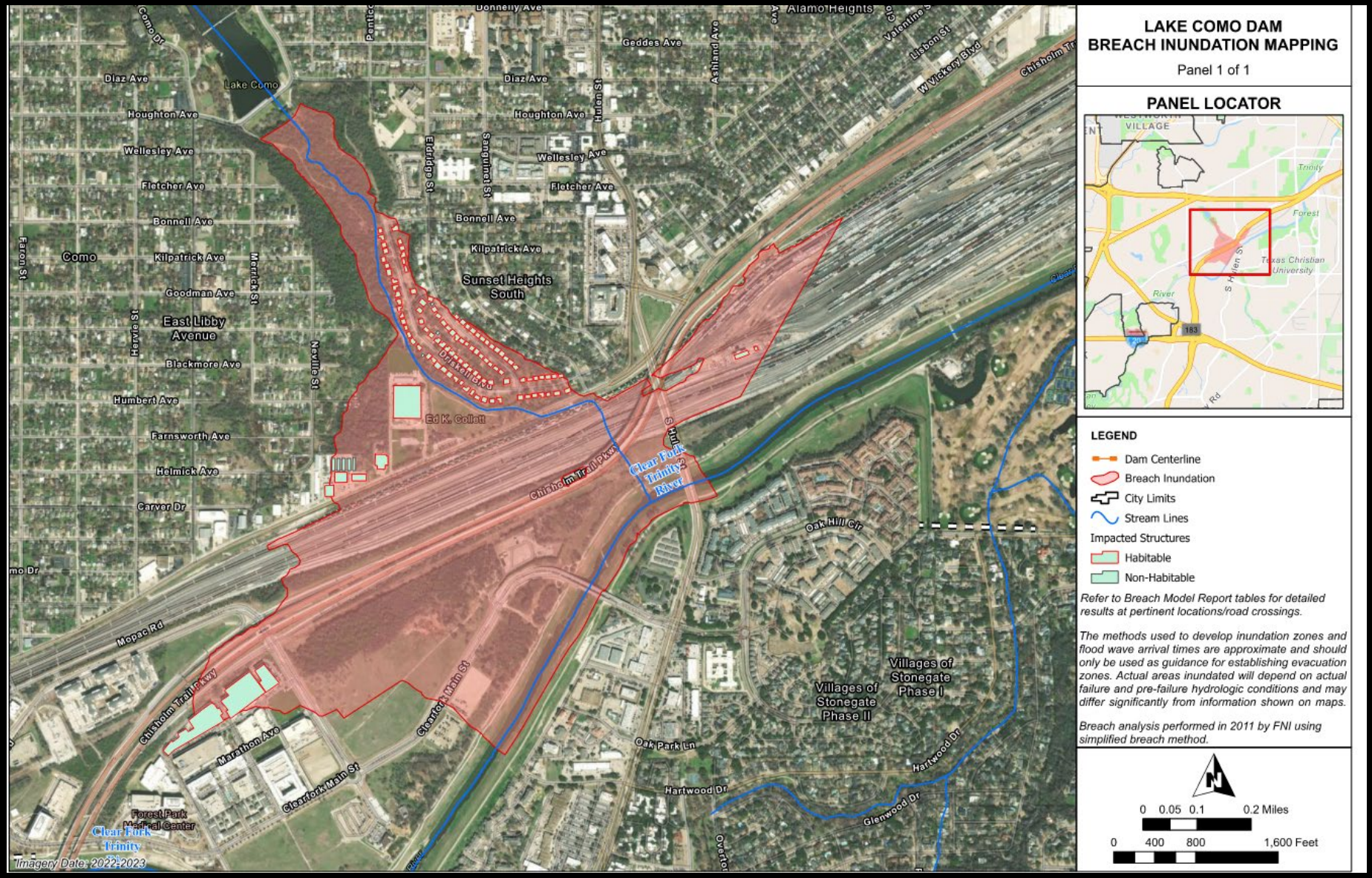
TAB 2

INUNDATION MAP

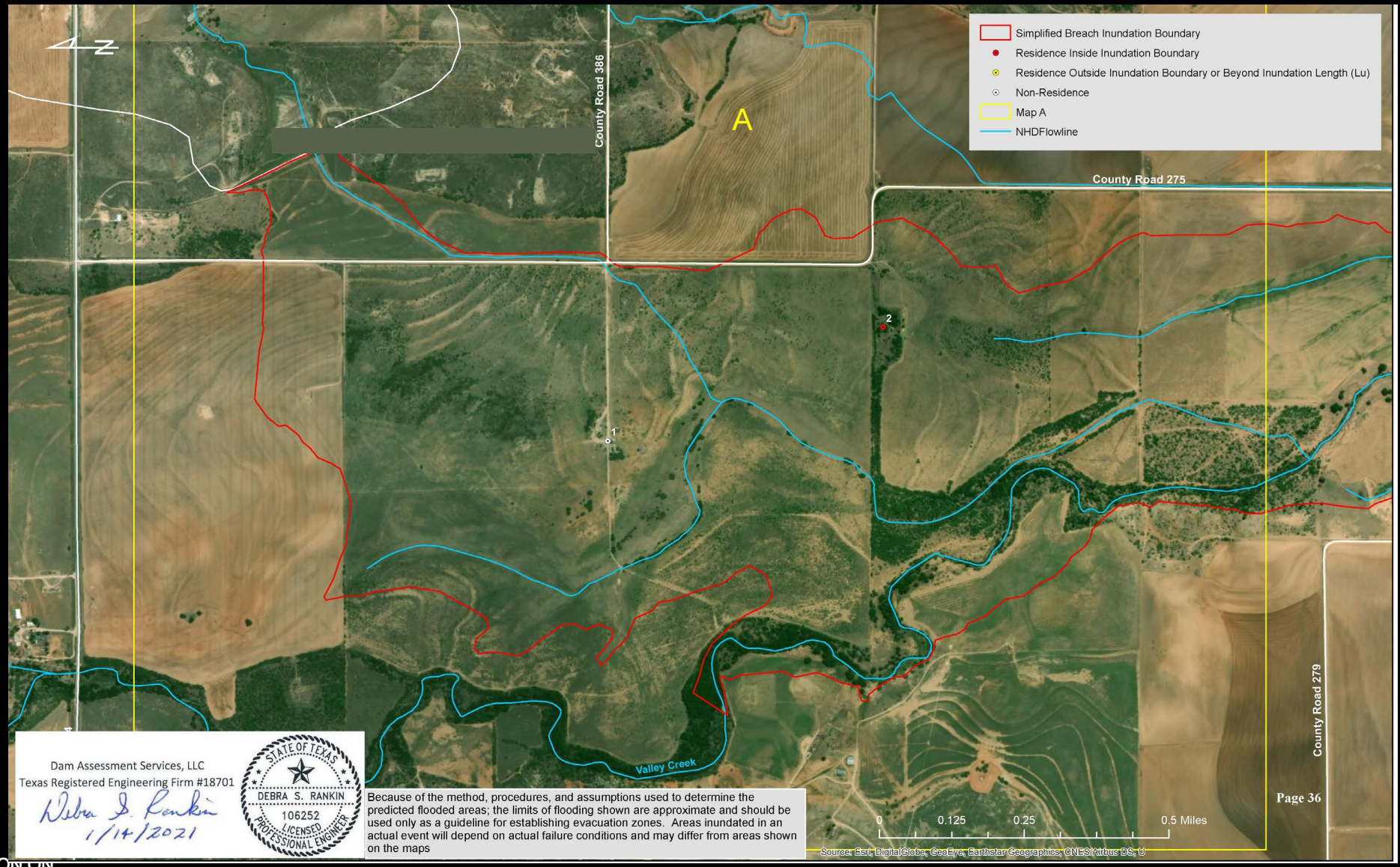


9B Family Farm LLC - EAP 18

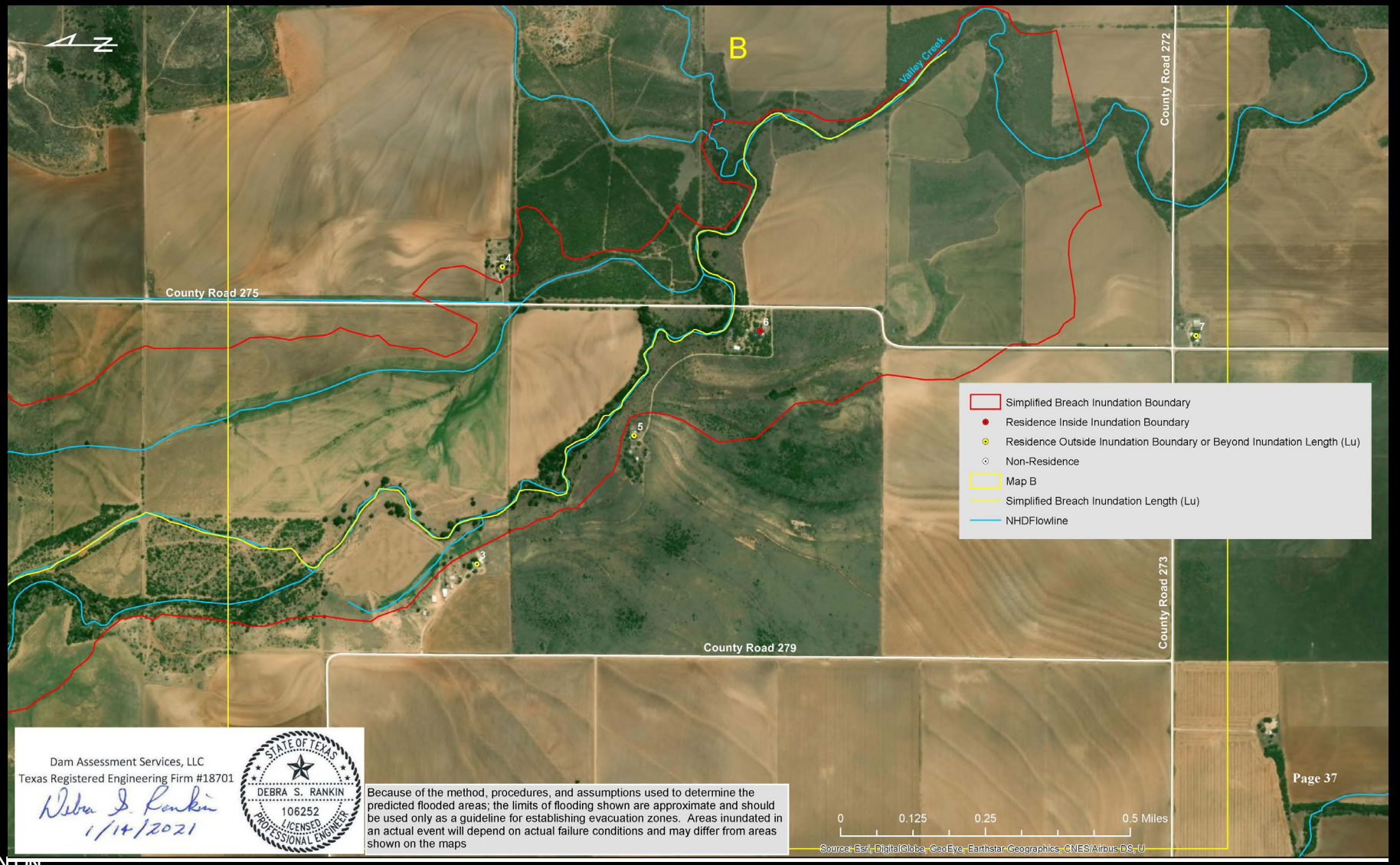
EMERGENCY ACTION PLANS – DETAILED MAP EXAMPLES



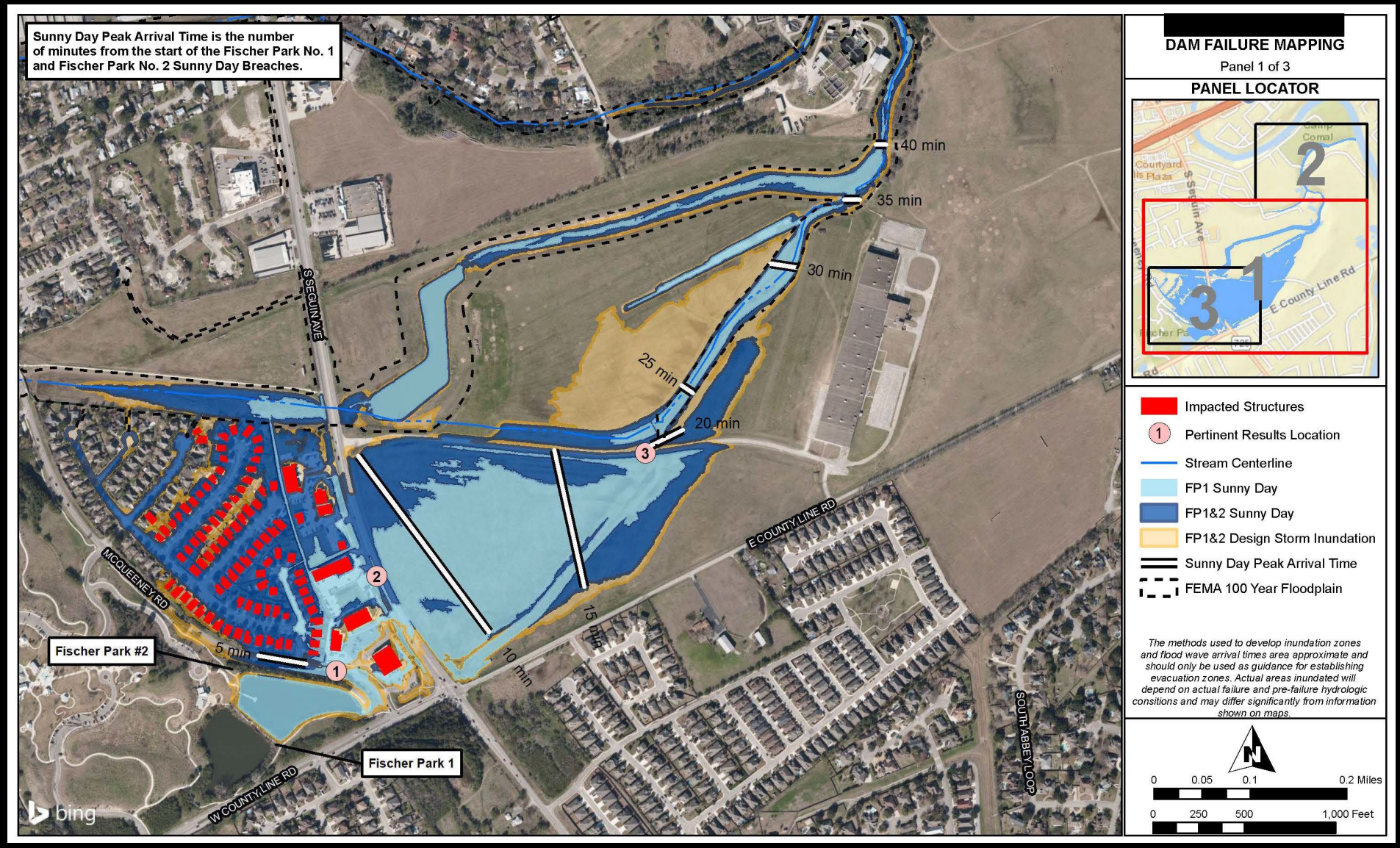
EMERGENCY ACTION PLANS – DETAILED MAP EXAMPLES 1 OF 2



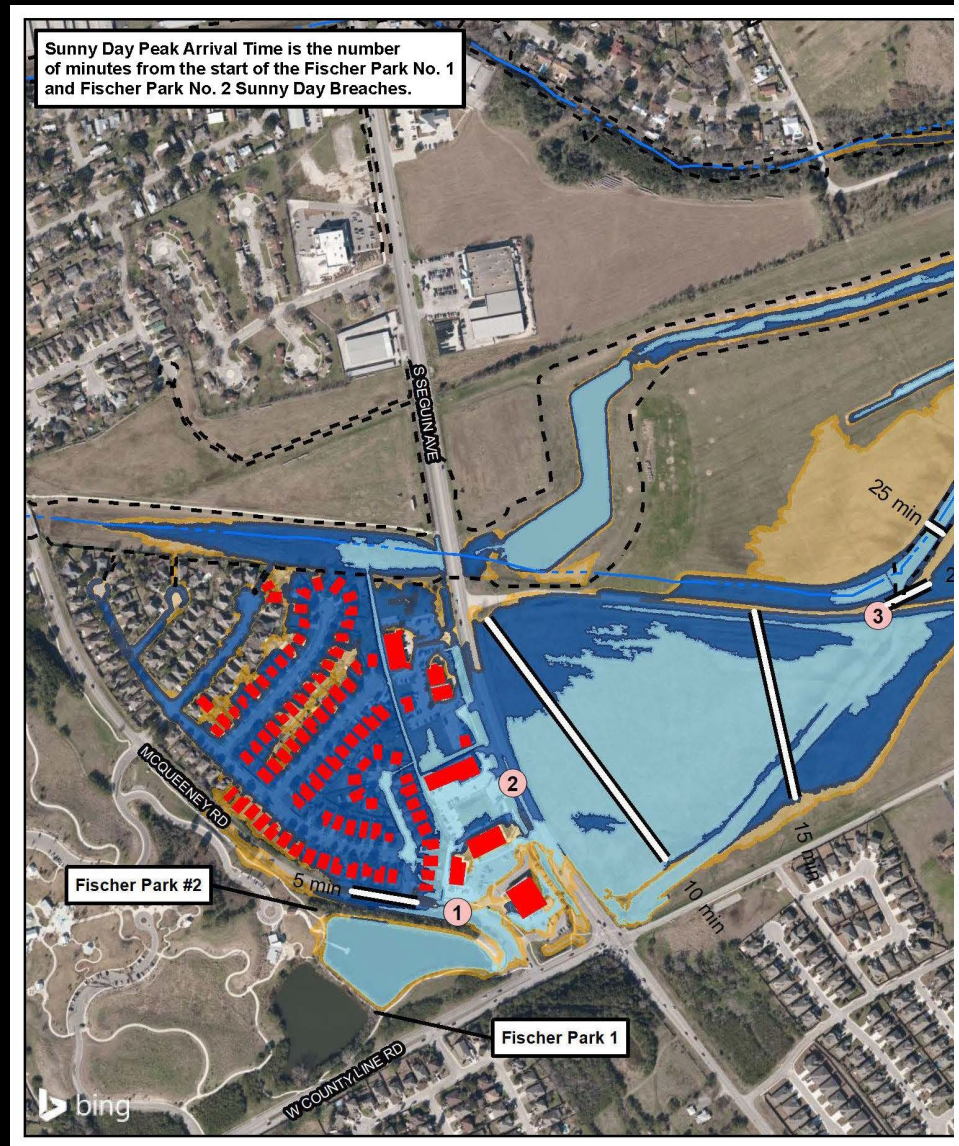
EMERGENCY ACTION PLANS – DETAILED MAP EXAMPLES 2 OF 2



EMERGENCY ACTION PLANS – DETAILED MAP EXAMPLES 1 OF 3



EMERGENCY ACTION PLANS – DETAILED MAI



7.0 BREACH IMPACTS AND EVACUATION PLAN

7.1 BREACH IMPACTS

The breach inundation maps illustrate the areas subject to flooding in the event the dam experienced a catastrophic failure. These maps in no way implies that the dam is unsafe or that dam failure is eminent. The immediate impact would be to areas downstream of the dam. The following structures could potentially be affected due to a breach event:

- McQueeney Road
- South Seguin Avenue
- Owens Corning Access
- Neighborhood with houses along:
  - Hidden Meadow
  - Spring Meadow
  - Meadow Park
  - Scenic Meadow
  - Placid Meadow
  - Serene Meadow

Downstream flood impacts can occur even if the dam does not breach.

7.2 EVACUATION PLAN

If imminent failure of the dam with uncontrolled downstream flooding is anticipated, City of New Braunfels Emergency Management Coordinator will activate emergency operations plans that support the immediate evacuation of downstream residents and businesses. In the event of a breach of the dam, the following locations are at risk of flooding:

- All activities within or in the immediate downstream of Dam 2
- McQueeney Road
- South Seguin Avenue
- Owens Corning Access
- Hidden Meadow and the surrounding neighborhood

Note that downstream flood impacts can occur even if the dam does not breach and additional evacuations may be required.

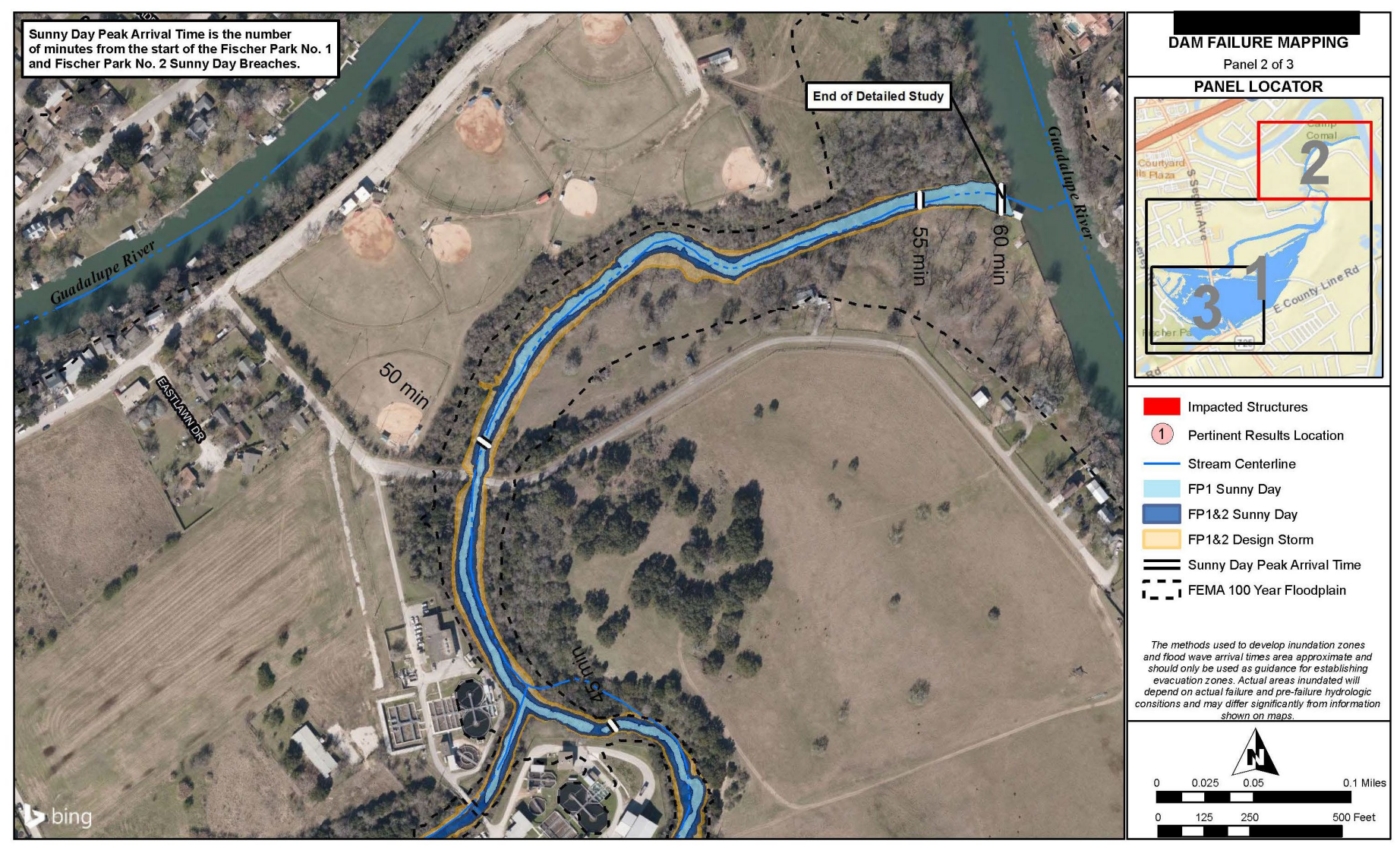
7.3 ROAD AND BRIDGE CLOSURES

In the event of significant flooding or a breach of the dam, City of New Braunfels Emergency Management
Coordinator will coordinate the efforts to minimize the risk to public safety to include restricting access to potential flood zones or infrastructure. This may include the following:

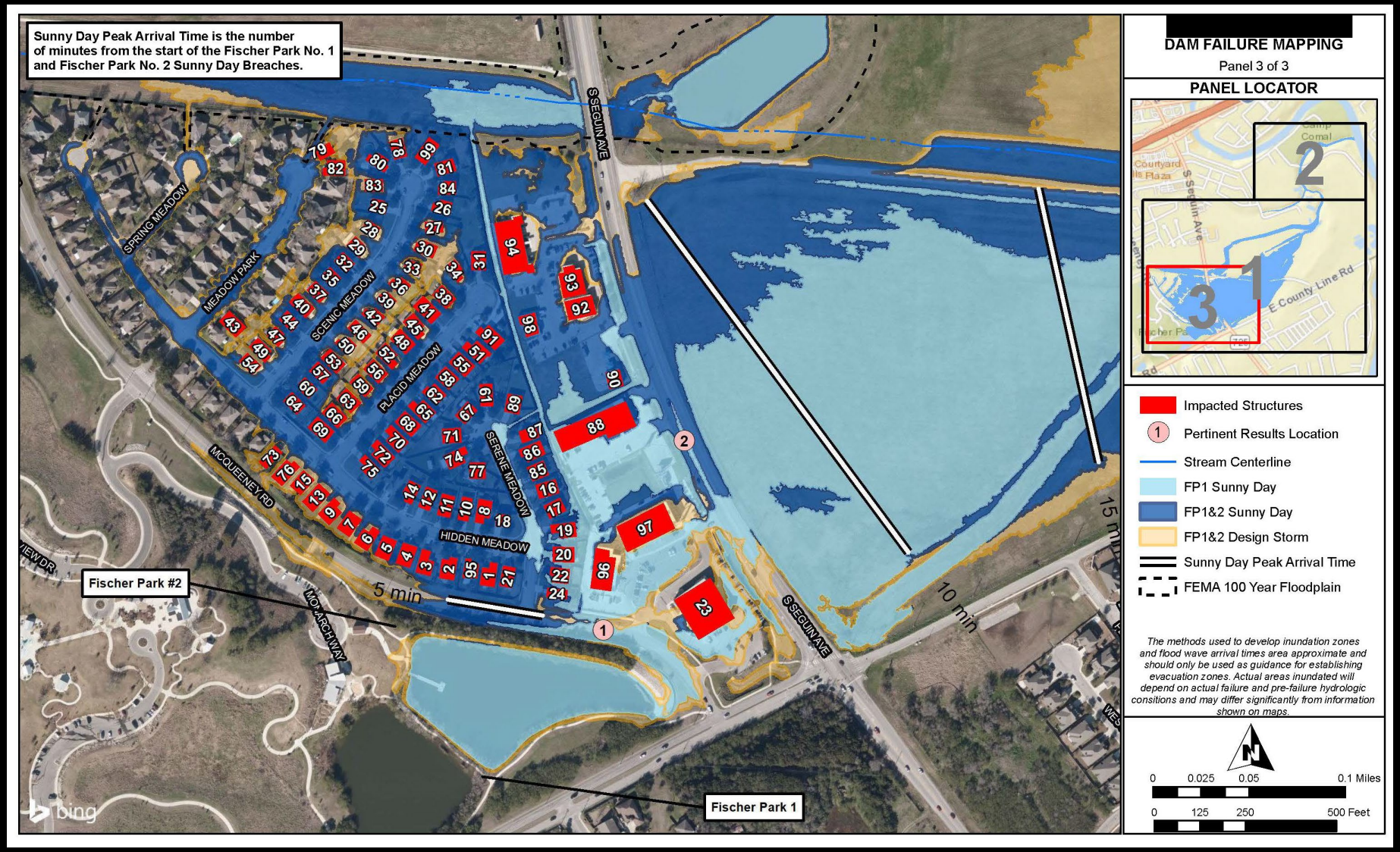
- McQueeney Road, South Seguin Avenue, and the Owens Corning Access should be closed
- Hidden Meadow, Spring Meadow, Meadow Park, Scenic Meadow, Placid Meadow, and Serene Meadow should be avoided.

Note that downstream flood impacts can occur even if the dam does not breach and additional road closures may be required.

EMERGENCY ACTION PLANS – DETAILED MAP EXAMPLES 2 OF 3

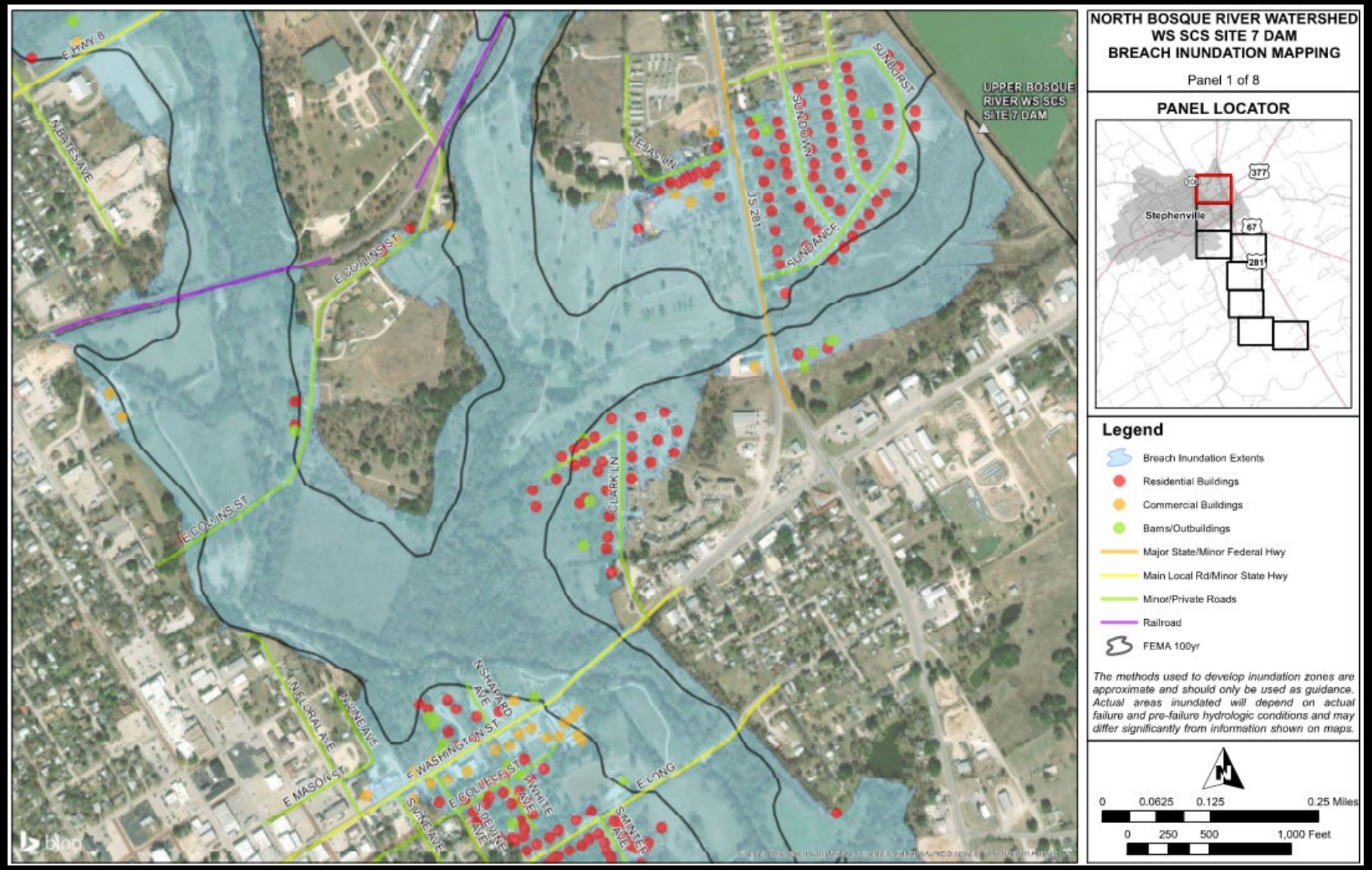


EMERGENCY ACTION PLANS – DETAILED MAP EXAMPLES 2 OF 3



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

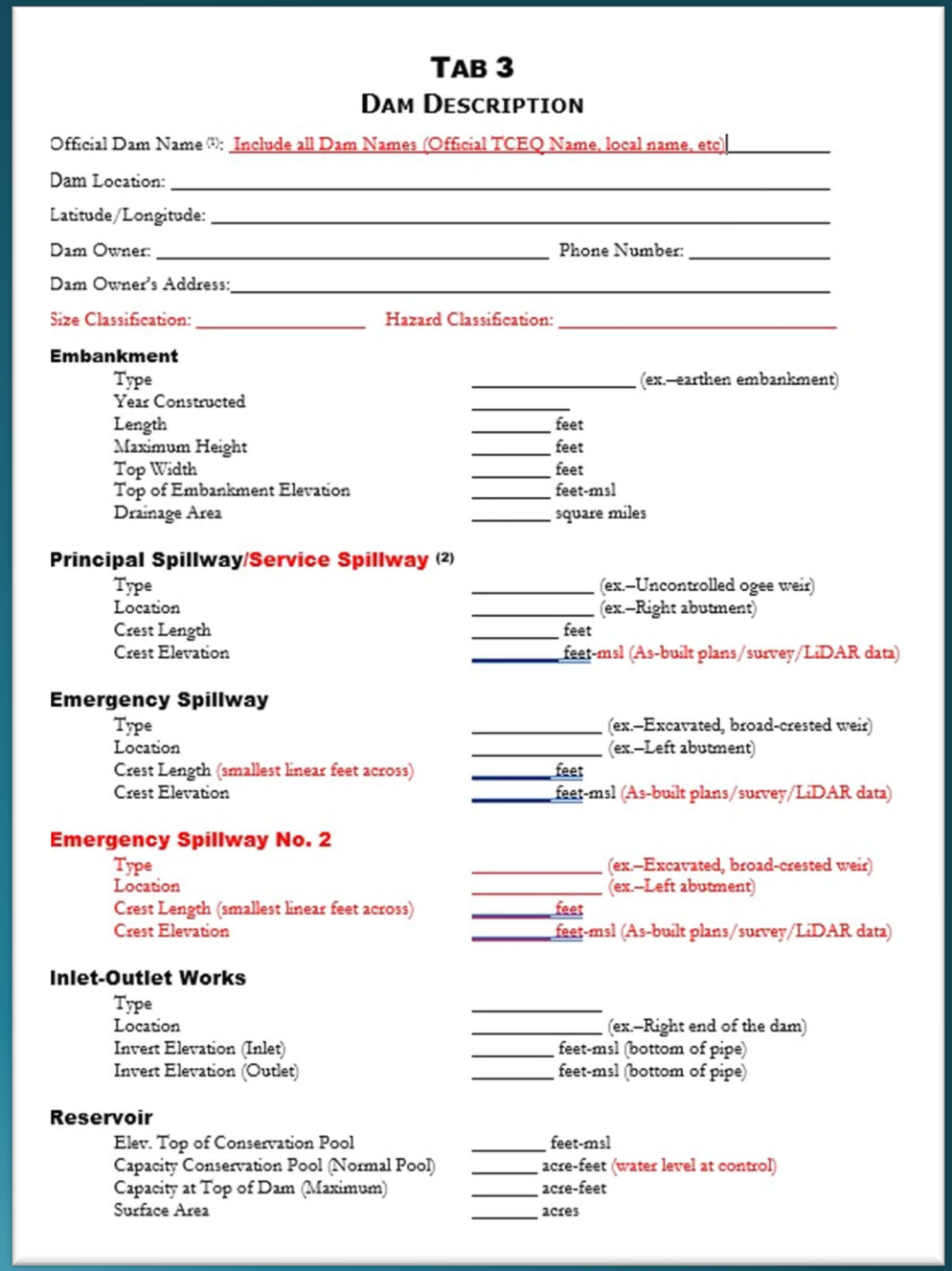
EMERGENCY ACTION PLANS – DETAILED MAP EXAMPLES - 1 OF 8 PANELS



EAP TEMPLATE

TAB 3 – DAM DESCRIPTION (C49, D81)

- Word Doc is used here to add information
- Size & Hazard classification can be added here instead of in Section 2.0
- TCEQ Inspection Reports refer to the Principal Spillway as the Service Spillway
- Can modify as needed with the word version



TAB 3

DAM DESCRIPTION

Official Dam Name [1]: Include all Dam Names (Official TCEQ Name, local name, etc)

Dam Location: _____

Latitude/Longitude: _____

Dam Owner: _____ Phone Number: _____

Dam Owner's Address: _____

Size Classification: _____ Hazard Classification: _____

Embankment

Type	_____ (ex.–earthen embankment)
Year Constructed	_____
Length	_____ feet
Maximum Height	_____ feet
Top Width	_____ feet
Top of Embankment Elevation	_____ feet-msl
Drainage Area	_____ square miles

Principal Spillway/Service Spillway [2]

Type	_____ (ex.–Uncontrolled ogee weir)
Location	_____ (ex.–Right abutment)
Crest Length	_____ feet
Crest Elevation	_____ feet-msl (As-built plans/survey/LiDAR data)

Emergency Spillway

Type	_____ (ex.–Excavated, broad-crested weir)
Location	_____ (ex.–Left abutment)
Crest Length (smallest linear feet across)	_____ feet
Crest Elevation	_____ feet-msl (As-built plans/survey/LiDAR data)

Emergency Spillway No. 2

Type	_____ (ex.–Excavated, broad-crested weir)
Location	_____ (ex.–Left abutment)
Crest Length (smallest linear feet across)	_____ feet
Crest Elevation	_____ feet-msl (As-built plans/survey/LiDAR data)

Inlet-Outlet Works

Type	_____
Location	_____ (ex.–Right end of the dam)
Invert Elevation (Inlet)	_____ feet-msl (bottom of pipe)
Invert Elevation (Outlet)	_____ feet-msl (bottom of pipe)

Reservoir

Elev. Top of Conservation Pool	_____ feet-msl
Capacity Conservation Pool (Normal Pool)	_____ acre-feet (water level at control)
Capacity at Top of Dam (Maximum)	_____ acre-feet
Surface Area	_____ acres

EAP TEMPLATE

TAB 4 – SAMPLE PUBLIC ANNOUNCEMENTS (C50, D82)

- Fill in the brackets where appropriate
- Change DPS to TDEM
- [Name] & [TX####] can stay as is if it is a consolidated EAP for multiple dams

Texas Division of Emergency Management District X Chief

TAB 4

SAMPLE PUBLIC ANNOUNCEMENTS

Note: These messages are communicated to downstream residents to alert the public of impending danger. The [Owner] should coordinate with the National Weather Service, the ~~Department of Public Safety [Location] District Coordinator office~~, and the Emergency Management Coordinators for [AAA, BBB, and CCC county] prior to release. Messages developed with the assistance of the National Weather Service may be used instead, which can be communicated via radio, television, and other media outlets.

Announcement for a Slowly Developing "Watch" Condition

[Owner] has declared a "Watch" condition for [Name] Dam, Texas ID [TX#####] 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 from the reservoir.]

Announcement for a Possible Dam Failure

This is an emergency message. [Owner] has declared a possible dam failure at [Name] Dam, Texas ID [TX#####] 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 from the reservoir.] Additional news will be made available as soon as it is received.

Announcement for an Imminent Dam Failure

Urgent! This is an emergency message. [Owner] has announced that [Name] Dam, Texas ID [TX#####] 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! This is an emergency message. [Name] Dam, Texas ID [TX#####] 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.

EAP TEMPLATE – TAB 5 – EVIDENCE OF DISTRESS (LG) / DIRECTORY OF PERSONNEL (SM/INT)

Large:
C51-54

TAB 5
EVIDENCE OF DISTRESS

General Observation	Specific Observation	Condition	Emergency Action	Equipment, Material and Supplies	Data to Record
Boils	Small boils, no increase of water flow, flowing clear water	Watch	Closely check all of downstream toe, especially in the vicinity of boil for additional boils, wet spots, sinkholes, or seepage. Closely monitor entire area for changes or flow rate increases.	None	Site and location, approximate flow
	Large or additional boils near previously identified ones, without increasing flow rate, but carrying small amount of soil particles	Watch	Initiate 24-hour surveillance. Monitor as described above. Construct sandbag ring dikes around boils, to cover them with water to retard the movement of soil particles. Filter cloth may be used to retard soil movement, but do not retard the flow of water.	Sandbags, filter cloth	Site and location, approximate flow
	Large or additional boils near previously identified ones, increasing flow rate, carrying soil particles	Possible Failure	Continue 24-hour surveillance. Continue monitoring and remedial action as described above. Initiate emergency lowering of the reservoir. Issue a warning to downstream residents.	Sandbags, pump	Site and location, approximate flow
	Rapidly increasing size of boils and flow increasing and muddy water	Imminent Failure	Downstream evacuation. Employ all available equipment to attempt to construct a large ring dike around the boil area.	Dozer, shovels, source of earthfill	Site and location, approximate flow
Seepage	Minor seepage of clear water at toe, on slope of embankment, or at the abutments	Watch	Closely check entire embankment for other seepage areas. Use wooden stakes or flagging to delineate seepage area. Try to channel and measure flow. Look for upstream whirlpools.	Wooden stakes, flagging	Site, location, approximate flow
	Additional seepage areas observed flowing clear water and/or increasing flow rate.	Watch	Initiate 24-hour surveillance. Monitor as described above. Construct measuring weir and channel all seepage through weir. Attempt to determine source of seepage.	Dozer, shovels	Site, location, approximate flow
	Seriously or rapidly increasing seepage, underseepage, or drain flow.	Possible Failure	Continue 24-hour monitoring and remedial action as described above. Initiate emergency lowering of the reservoir. Construct a large ring dike around the seepage area.	Dozer, shovels, source of earthfill	Site location, approximate flow
	Additional seepage areas with rapid increase in flow and muddy water.	Imminent Failure	Downstream evacuation. Employ all available equipment to attempt to construct a large ring dike around the seepage area.	Dozer, shovels, source of earthfill	Site location, approximate flow

Int/Small:
D83

TAB 5
DIRECTORY OF PERSONNEL WITH DAM SAFETY EXPERTISE

The following list identifies additional individuals with expertise in dam safety, design and construction, such as local engineers, contractors, and authorities that may be consulted about taking specific actions at the dam when there is an emergency situation. The TCEQ Dam Safety Section is not included in this section. TCEQ Dam Safety should be contacted during an emergency and can provide technical assistance by phone, but not immediate on-site assistance. TCEQ is not responsible for emergency evacuation.

NAME	TELEPHONE	RESPONSIBILITY

EAP TEMPLATE – TAB 6 – SUPPLIES & RESOURCES / TAB 7 – ANNUAL EAP EVALUATION CHECKLIST

Large:
C55

Int/Small:
D84

TAB 6
SUPPLIES AND RESOURCES

The following equipment and supplies may be necessary for use during a dam emergency. Contact information for local contractors who can provide the following items during an emergency is listed below. For supplies owned by the dam owner, the dam owner's name and the specific location of the supplies have been denoted.

EQUIPMENT/SUPPLIES	LOCATION
Backhoes Dump trucks Portable welding equipment Generators Bulldozers Excavators Loaders Motor graders	[Names, addresses, and phone numbers of contractors]
Crane	[Names, addresses, and phone numbers of contractors]
Sandbags	[Names, addresses, and phone numbers of suppliers]
Rock riprap	[Names, addresses, and phone numbers of suppliers]
Fill Material	[Names, addresses, and phone numbers of suppliers]
Other - _____	[Names, addresses, and phone numbers of suppliers]

Large:
C56

Int/Small:
D85

TAB 7
ANNUAL EAP EVALUATION CHECKLIST

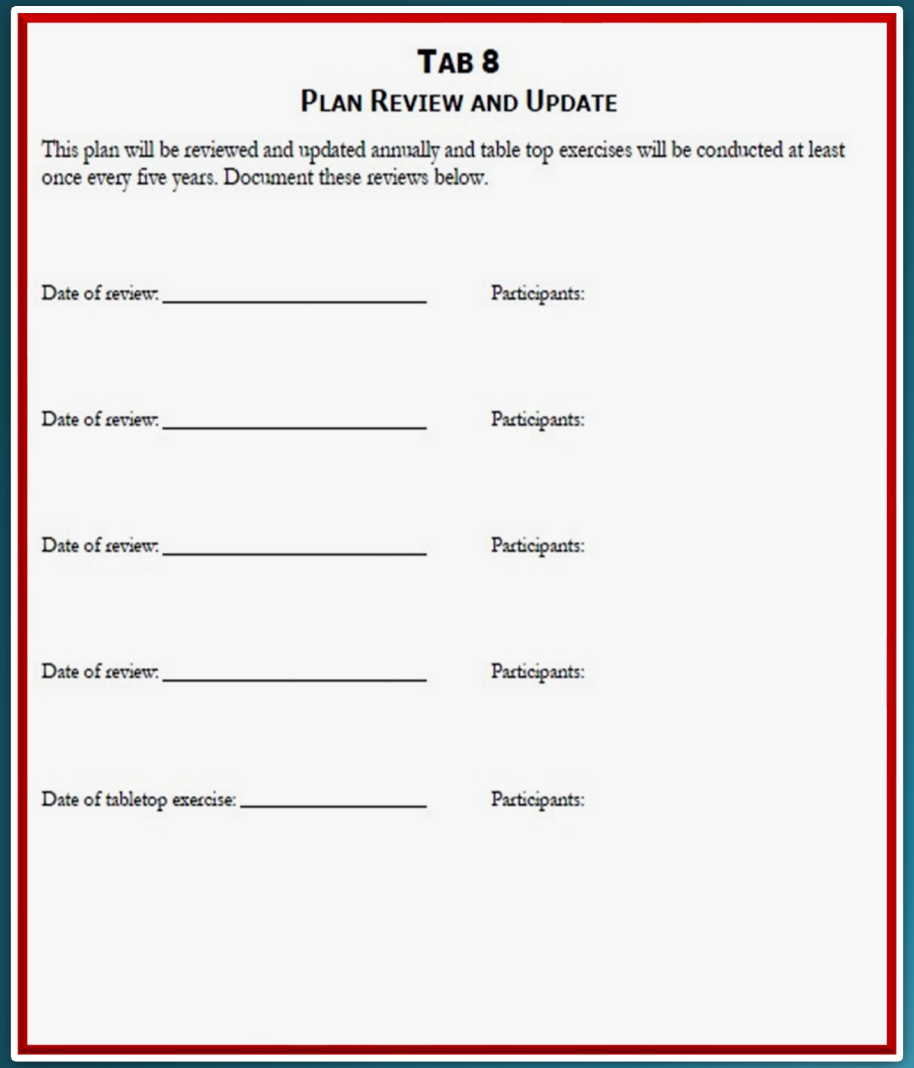
Was the annual dam inspection conducted?	☐ Yes ☐ No	If yes, has the EAP been revised to include any signs of failures observed during the inspection?	☐ Yes ☐ No
Was brush clearing, animal burrow removal, or other maintenance required?	☐ Yes ☐ No	If yes, describe actions taken and date:	
Was the outlet gate operable?	☐ Yes ☐ No	If no, describe actions taken and date:	
Do the Notification Flowcharts require revision? (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.)	☐ Yes ☐ No	If yes, list the dates of the contact information revision and redistribution:	
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:	

_____ _____
[Name and Title of Appropriate Manager for Owner] Date

EAP TEMPLATE – ANNUAL FORMS: TAB 8 – PLAN REVIEW & UPDATE/ TAB 9 – TRAINING RECORD

Large:
C57

Int/Small:
D86



TAB 8

PLAN REVIEW AND UPDATE

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

Date of review: _____ Participants:

Date of review: _____ Participants:

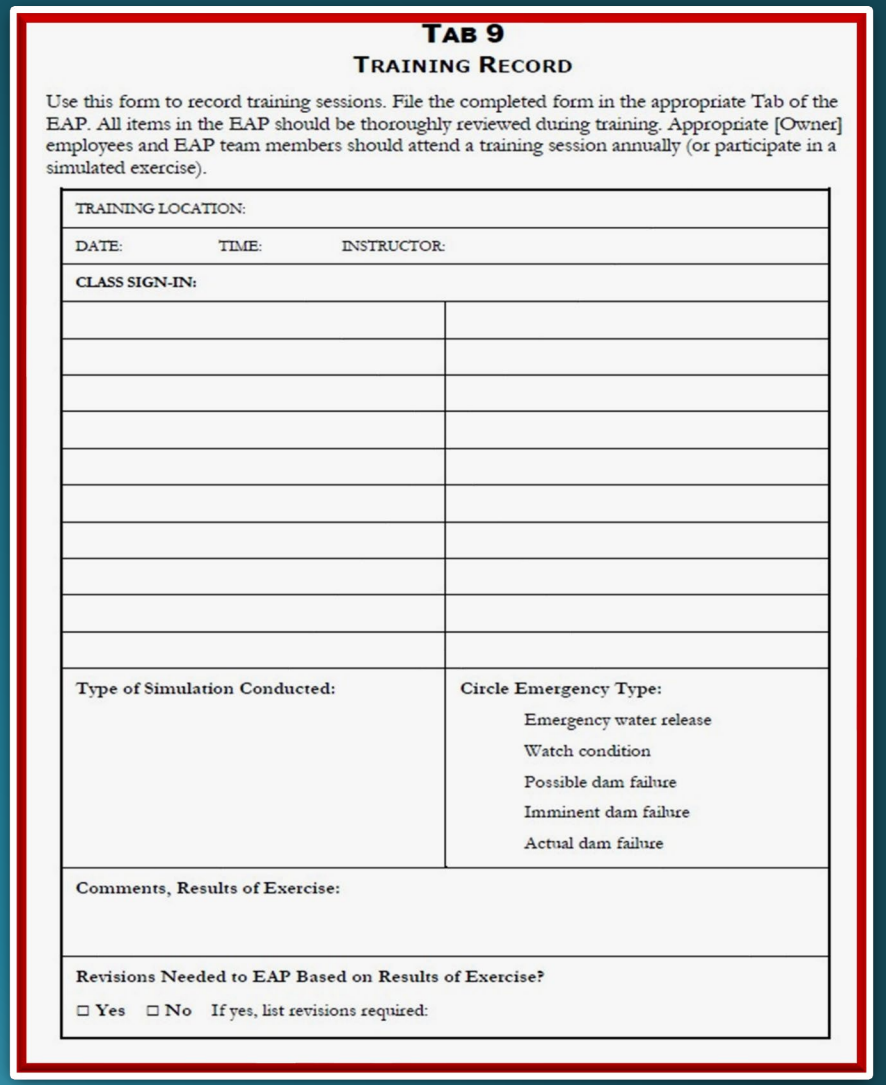
Date of review: _____ Participants:

Date of review: _____ Participants:

Date of tabletop exercise: _____ Participants:

Large:
C58

Int/Small:
D87

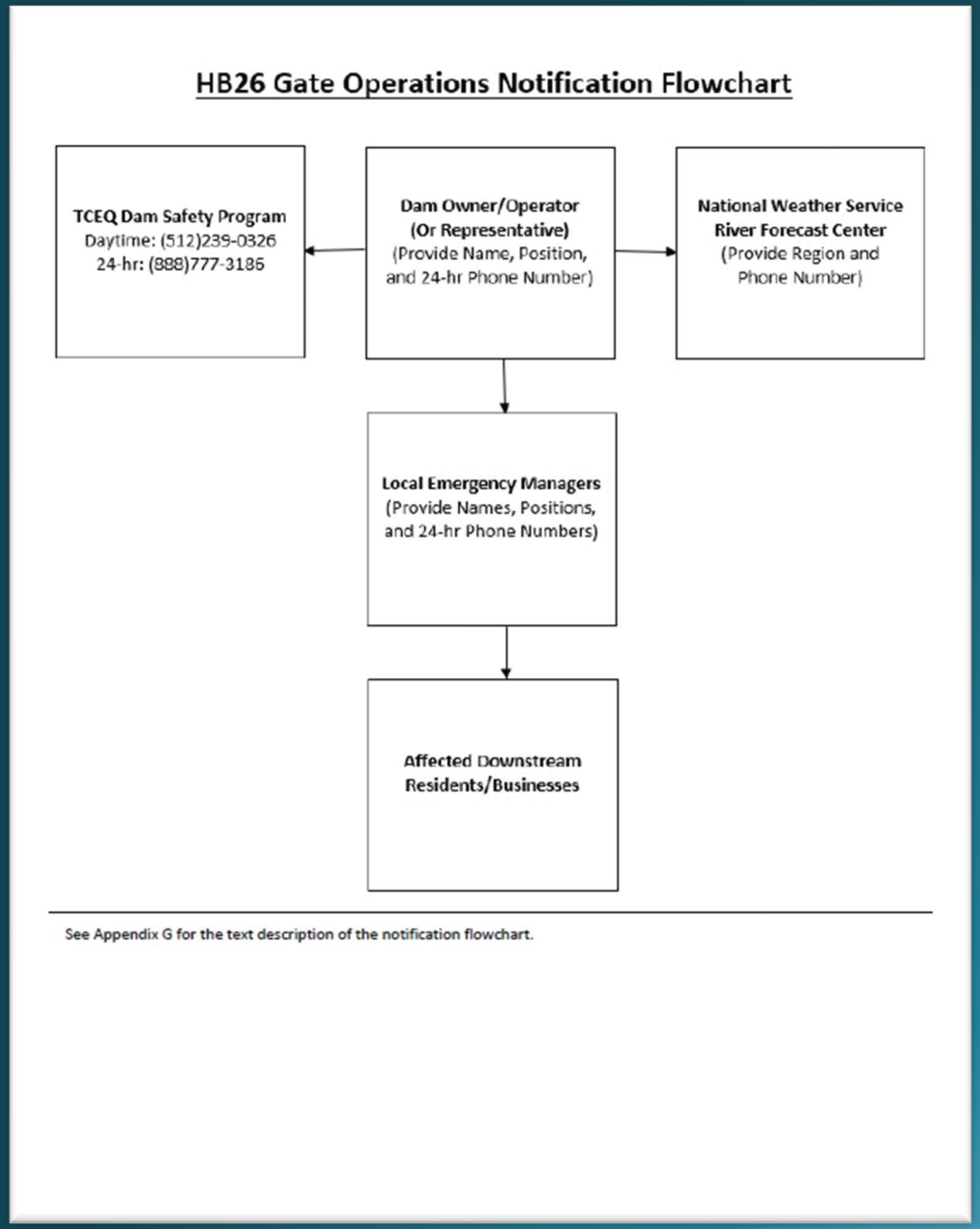


TAB 9

TRAINING RECORD

Use this form to record training sessions. File the completed form in the appropriate Tab of the EAP. 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:	
Type of Simulation Conducted:	Circle Emergency Type: Emergency water release Watch condition Possible dam failure 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:	



EAP TEMPLATE

TAB 10 – HOUSE BILL 26 (PAGES 23-26)

- Legislation changed for dams with spillway gates
- Intermediate and large dams only
- Requires notification downstream when releases are made to regulate flood control

TIPS

- Footer with page numbers and version date
- Use letters when the annual pages are updated – 34A, 34B
- Send a new cover letter with ‘Updated on MM/DD/YYYY’ to aid in version control
- Get draft approved before obtaining signatures
- Maps are legible at night, during a rainstorm, with a flashlight!
- All EMC’s (each County impacted by inundation) must sign EAP
- Consolidate if more than one dam

DAMS DON'T FAIL VERY OFTEN, BUT WHEN THEY DO, LIVES ARE AT STAKE.

THE EAP HELPS PROTECT THOSE AFFECTED WHEN A NORMAL DAY BECOMES A DAM DISASTER DAY.

Q & A

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