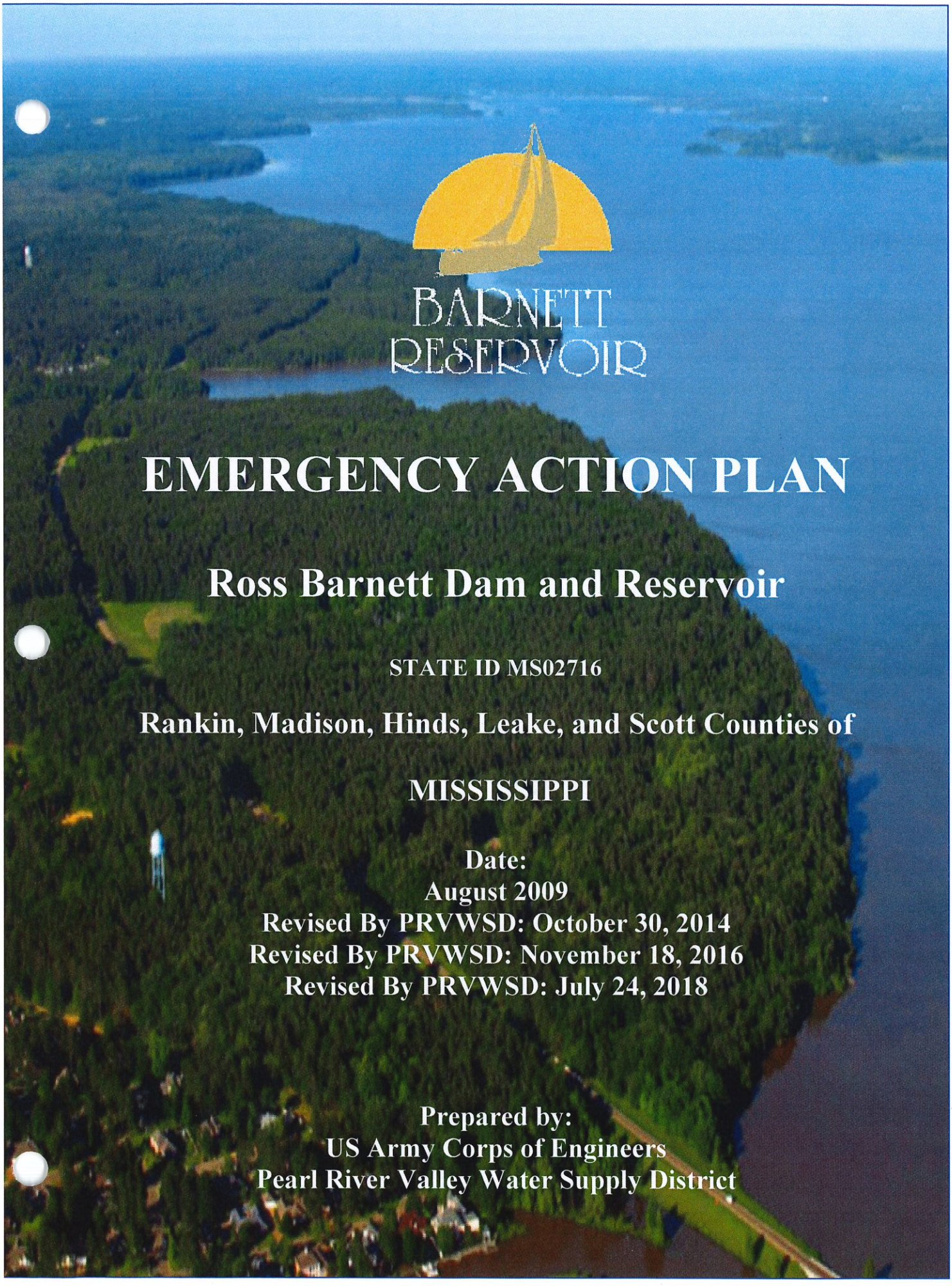


EMERGENCY ACTION PLAN

Ross Barnett Dam and Reservoir

STATE ID MS02716

Rankin, Madison, Hinds, Leake, and Scott Counties of

MISSISSIPPI

Date:
August 2009
Revised By PRVWSD: October 30, 2014
Revised By PRVWSD: November 18, 2016
Revised By PRVWSD: July 24, 2018

Prepared by:
US Army Corps of Engineers
Pearl River Valley Water Supply District

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Vicksburg District of the Corps of Engineers, in association with the Pearl River Valley Water Supply District (PRVWSD), has performed a study to identify the areas downstream of Ross Barnett Reservoir and Dam that would be impacted by three hypothetical failures of the Dam. The report that follows discusses the hypothetical failures and the hydraulic analysis performed. The information developed in the course of the study includes areas flooded, warning times, times to peak flood elevations and peak flood elevations. The report that follows includes this information, as well as, sample news releases for public information and contact information for emergency response personnel furnished by PRVWSD. The information in the report is used by the PRVWSD to develop detailed response plans in the event of an emergency at the Dam.

I. STATEMENT OF PURPOSE

This plan defines responsibilities and provides procedures designed to identify unusual and unlikely conditions that may endanger the Ross Barnett Reservoir Dam and to notify the appropriate emergency management officials of possible, impending, or actual failure of the Dam. The plan may also be used to provide notification when flood releases will create major flooding.

II. PROJECT DESCRIPTION

The Ross Barnett Dam is located in Rankin, Madison, and Hinds Counties of Mississippi. The Dam owner is the Pearl River Water Supply District (hereafter referred to as "the District"). The primary function of the lake is water supply for the city of Jackson. The Dam's construction was completed in 1965. The Dam and lake characteristics were determined by examination of topographic maps, field surveys, and as-built drawings. At its normal pool elevation of 297.5, the Ross Barnett Dam impounds approximately 300,000 acre-feet with a surface area of about 33,000 acres.

The principal spillway is located in the center of the Dam. The principal spillway consists of reinforced concrete having 10 tainter gates, 21 feet high by 40 feet wide, and will carry a maximum flow of 180,000 cfs (cubic feet per second). The 700-foot wide emergency spillway is located in the left abutment and will operate only in the event of an extreme flood to prevent the Dam from overtopping. The emergency spillway will carry a maximum flow of 50,000 cfs.

III. ACCESS TO SITE

Primary access to the site is by Spillway Road to the Dam which is not susceptible to inundation in the event of Dam failure. Bob Anthony Parkway (Spillway Road) where it crosses the Dam will be closed. If a failure is in the western embankment (west of the spillway gates), then the staging area will be at the Madison Ramp. If a failure is in the eastern embankment (east of the spillway gates), or the emergency spillway is activated, then the staging area will be Lakeshore Park. All emergency responders will mobilize to the staging areas and report to the Incident Commander.

IV. MEDIA RELATIONS AND PRESS RELEASES

A. Media Relations

1. As soon as a problem has been identified, the proper press release should be selected from Paragraph C. below and immediately delivered through an e-mail blast to the list provided below. Press releases are mandatory for warning and emergency situations. In case of a watch, depending on the severity, the incident commander will decide if a press release is necessary.

2. In an emergency situation, media center(s) must be chosen and established, and all media should be directed to that area.

3. A schedule of press conferences must be set, beginning when Emergency Manager is prepared to address the media at media center.

4. Internet, social media, and telephone communication will be established to provide the most updated information during watches, warnings and emergencies.

B. Email Blast List

jkme@ap.org; news@mpbonline.org; news@wlbt.com; news@wapt.com; wjtvnews@wjtv.com; Randybell@iheartmedia.com; Kennywindham@iheartmedia.com; Toddberry@iheartmedia.com; Camie@telesouth.com; majic104@yahoo.com; wfff@wfffradio.com; wrjwradio@bellsouth.net; wjdr2057@windstream.com; wcju@wcjufm.com; wwlnewsroom@yahoo.com; dskipper@jackson.gannett.com; news7@wdam.com; newsrelease@wxxv25.com; wtyl@bellsouth.net; tylertowntimes@bellsouth.net; hgater@jackson.gannett.com; jbkelly@jackson.gannett.com; tramsdell@jackson.gannett.com; ewilliams@jackson.gannett.com; dbean@jackson.gannett.com; dduglel@jackson.gannett.com; sward2@jackson.gannett.com; srhall@jackson.gannett.com; david@y101.com

C. Prepared Press Releases By Emergency Classification

Emergency: Occurring or has occurred

URGENT: The Ross Barnett Reservoir Dam has failed. The Pearl River Valley Water Supply District has advised residents and businesses to evacuate low-lying areas along the Pearl River in Hinds, Rankin, Copiah, Simpson and Lawrence counties. Move to high ground immediately. The road across the dam has been closed and other roads and bridges downstream could soon be affected. Monitor the developing situation through local media or online at www.therez.ms.

Warning: Failure could happen at any time

URGENT: The Pearl River Valley Water Supply District has announced that the Ross Barnett Reservoir Dam is in imminent danger of failure. Low-lying areas along the Pearl River in Hinds, Rankin, Copiah, Simpson and Lawrence counties are in danger of being flooded. Residents and businesses in these areas should evacuate to high ground immediately. The road across the dam has been closed and other roads and bridges downstream could soon be affected. Monitor the developing situation through local media or online at www.therez.ms.

Watch: Potential for failure exists

The Pearl River Valley Water Supply District is currently monitoring a situation involving the dam at Ross Barnett Reservoir. District officials warn that the potential exists for adverse impacts if the situation intensifies. Reservoir staff is monitoring **(Insert problem area).** Residents and businesses in low-lying areas near **(Insert the areas of possible impact)** are advised to prepare for flooding if the situation worsens. Monitor the latest information through local media outlets or get information online as it happens at www.therez.ms.

V. INUNDATION MAPS

Areas possibly affected by failure of Ross Barnett Reservoir Dam or by flooding as a result of large operational releases are as follows:

- Ridgeland - Harbor Pines Mobile Home Community
- Mule Jail Hunting Club
- Rankin County - Barnett Bend Subdivision
- Low-lying areas of Jackson
- Low-lying areas of Byram
- Low-lying areas along the Pearl River

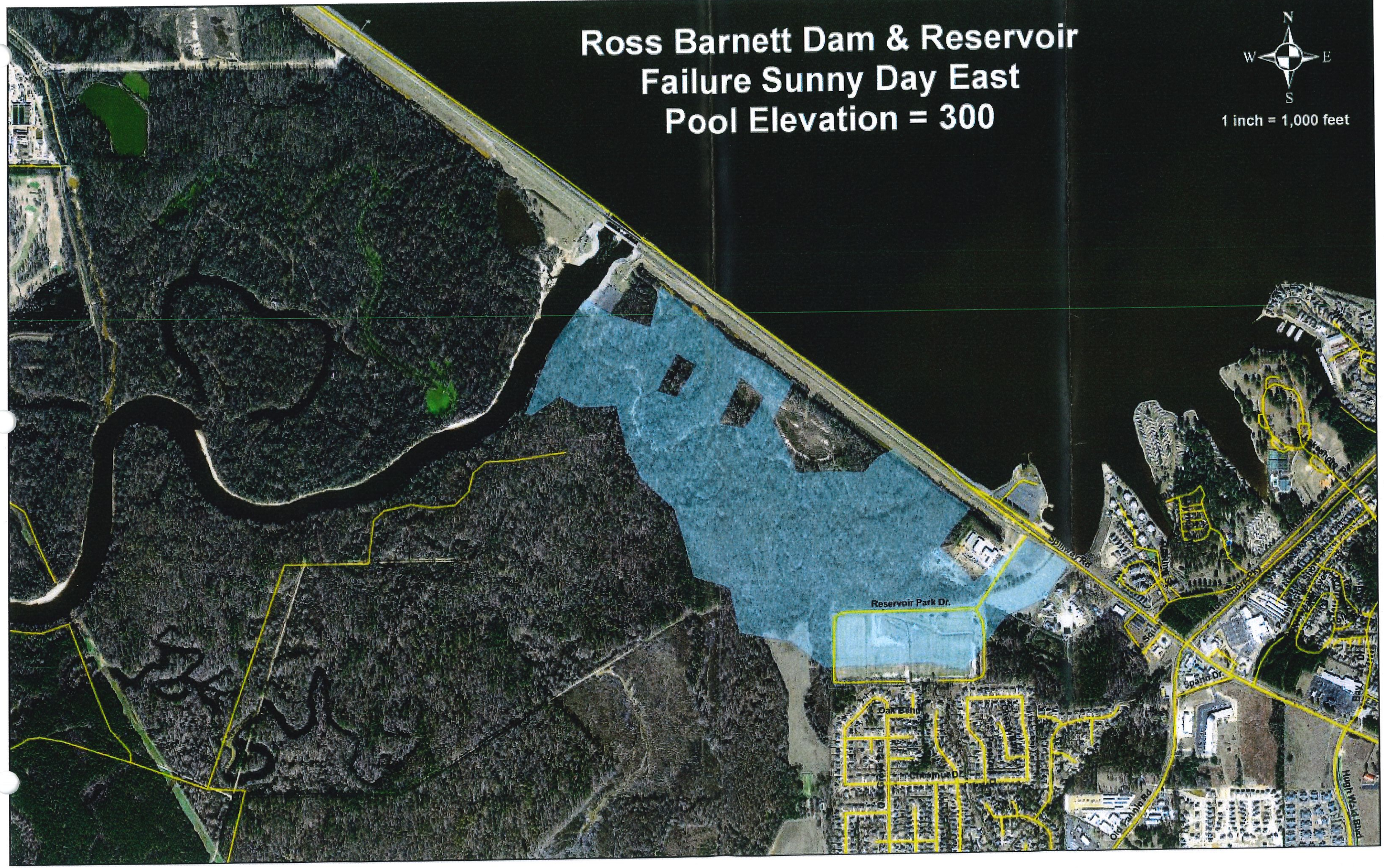
The area immediately downstream of the Reservoir that will be inundated is shown in inundation maps on pages 8-11. The index of inundation maps and all inundation maps showing areas affected from the Reservoir to Lawrence County are found on pages 12-21.

These inundation maps are based on the Hydrology and Hydraulics Report included in the appendix; actual conditions may vary, which could result in a different emergency event than depicted in these inundation maps.

Ross Barnett Dam & Reservoir
Failure Sunny Day East
Pool Elevation = 300

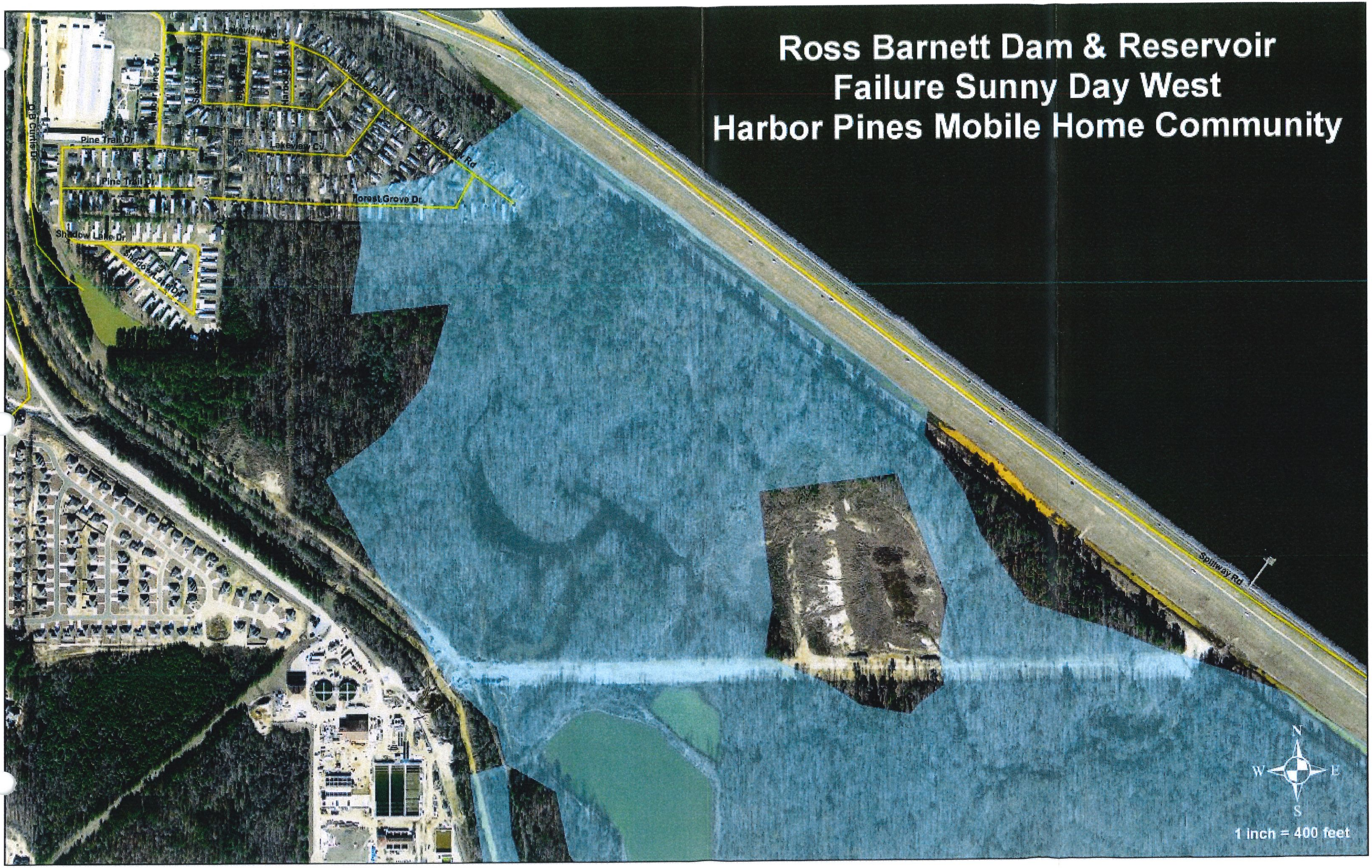
N
W E
S

1 inch = 1,000 feet




Spillway Rd.
Reservoir Park Dr.
Village Square Dr.
Oak Bend
Post Oak Dr.
Cherry Bark Ln.
Chestnut Dr.
Ross Barnett Dam & Reservoir
Failure Sunny Day East
Pool Elevation = 300
N
W
E
S
1 inch = 400 feet

Ross Barnett Dam & Reservoir
Failure Sunny Day West
Harbor Pines Mobile Home Community



Ross Barnett Dam & Reservoir
Failure Sunny Day West

N
W E
S

1 inch = 1,000 feet

Ross Barnett Dam & Reservoir
Failure Bank Full Stage
Inundation Maps
Index

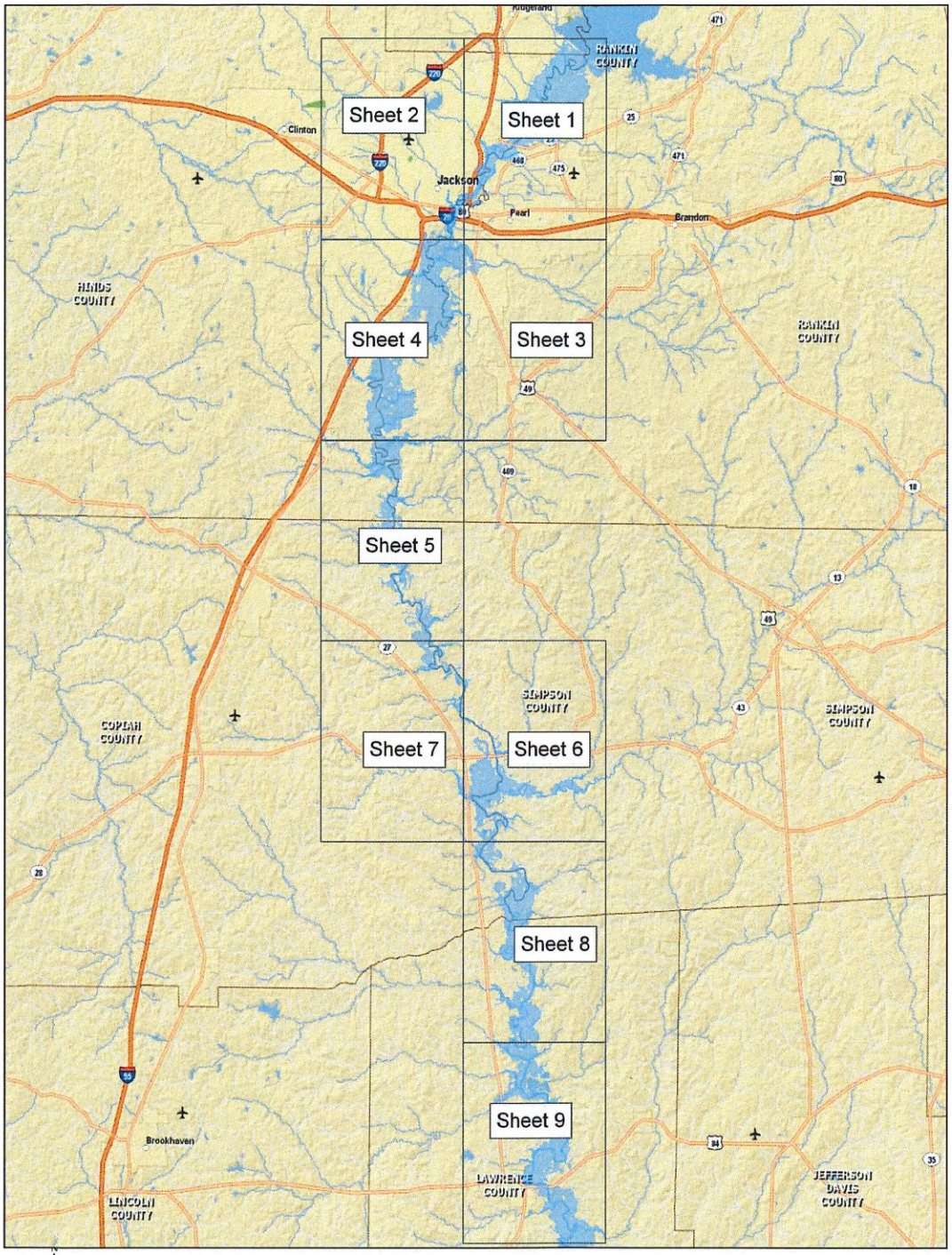


PLATE 1

Ross Barnett Dam & Reservoir
Failure Bank Full Stage

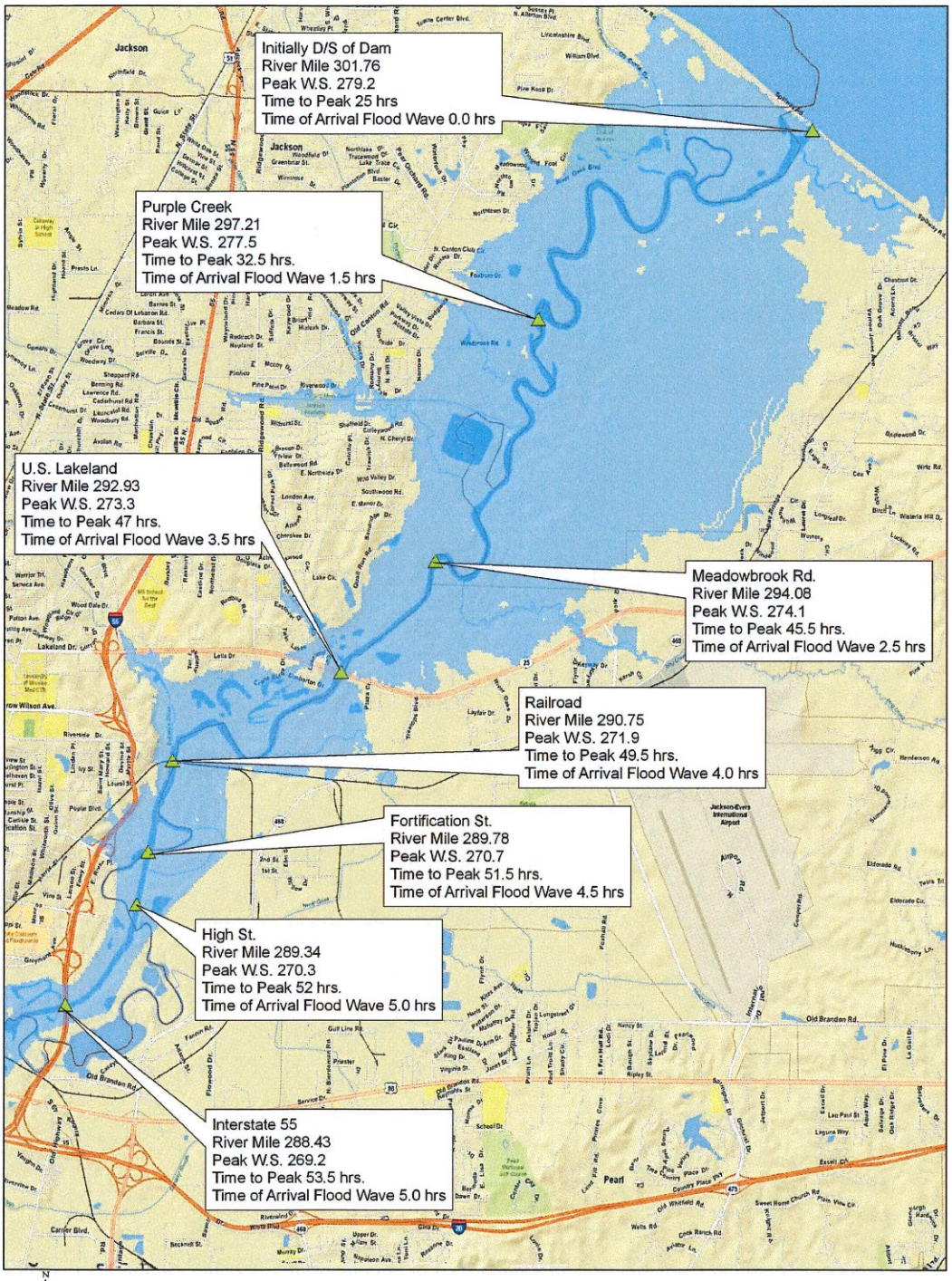
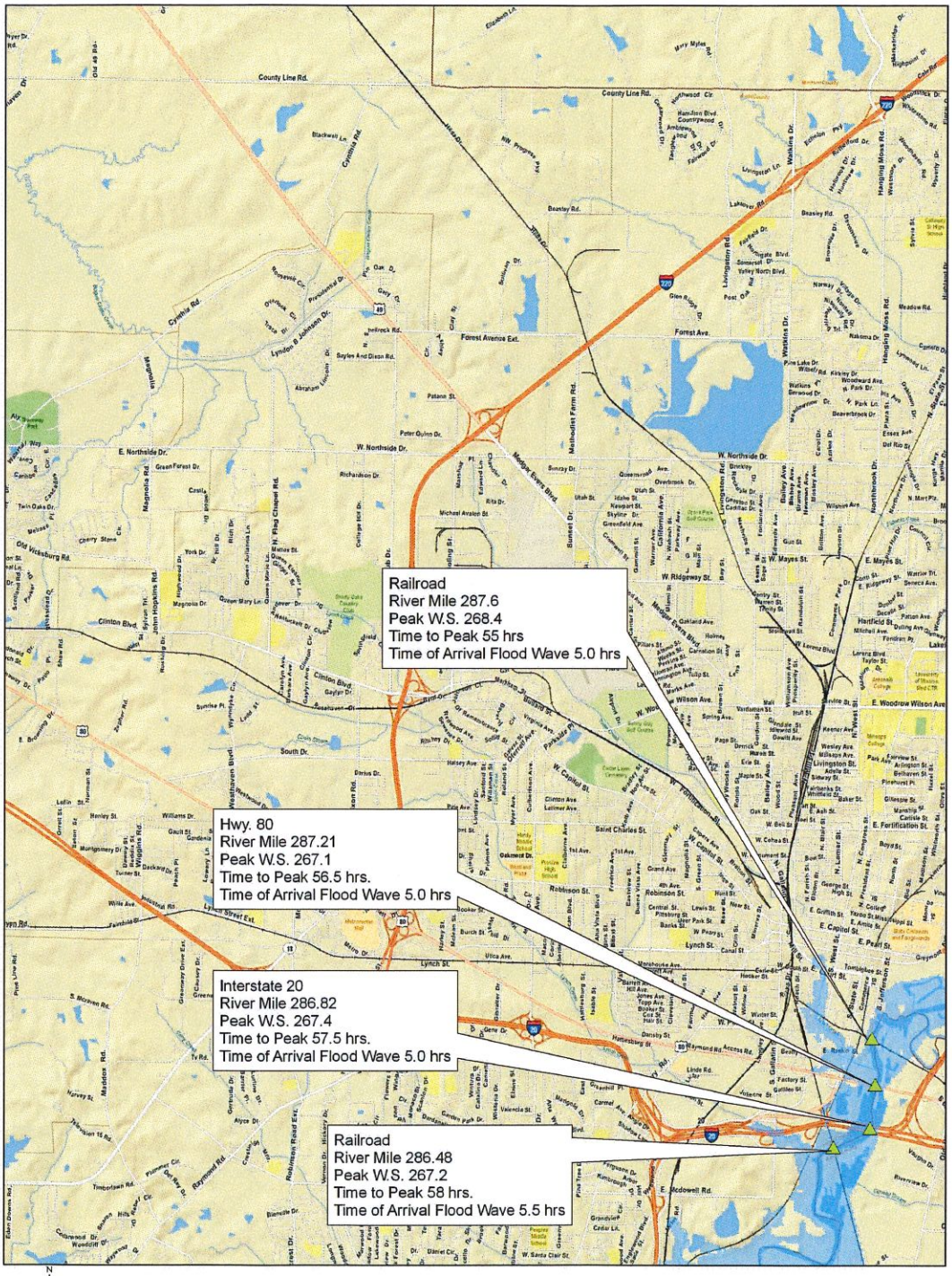


PLATE 2

1" = 4000 feet

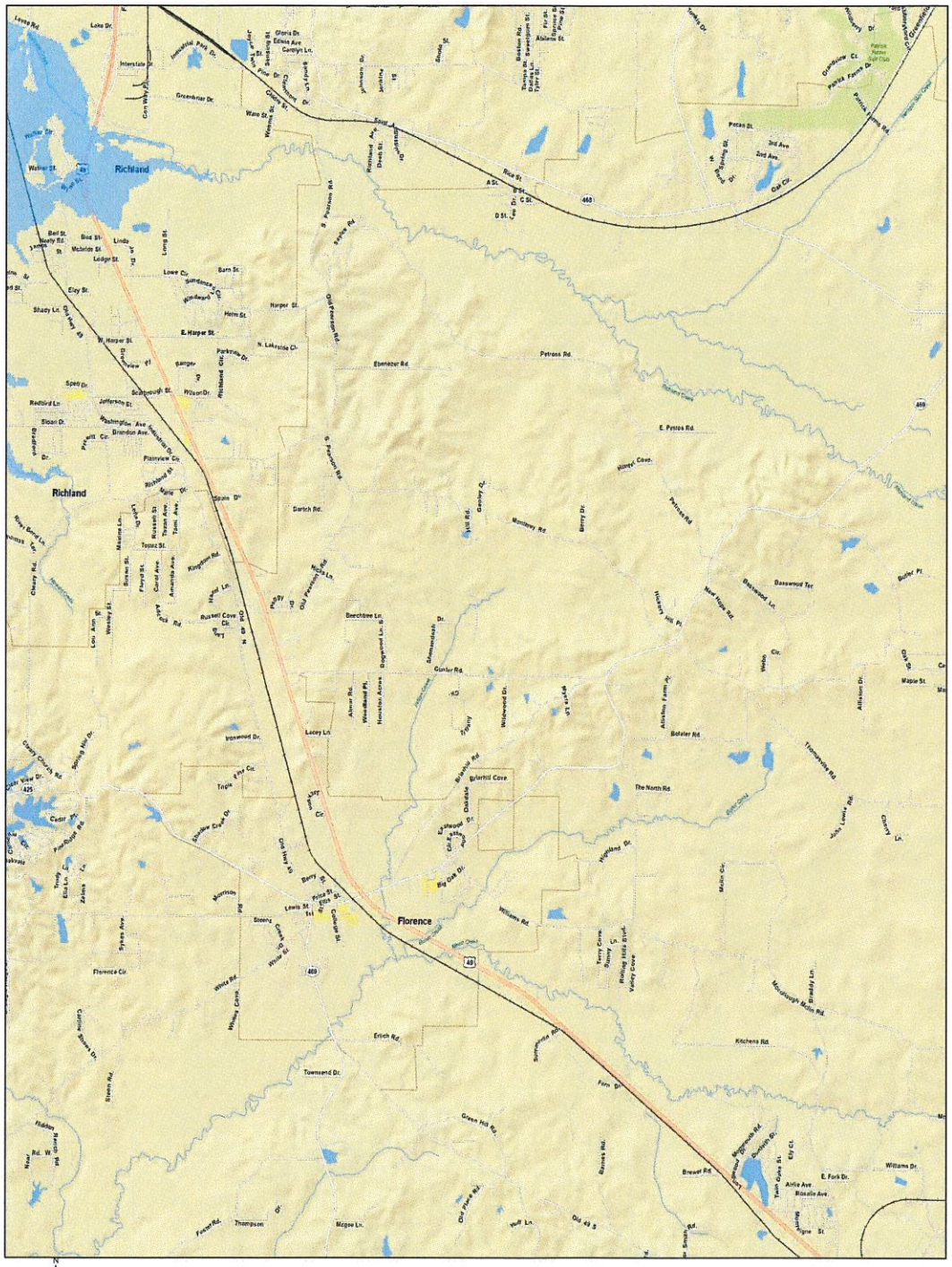
Ross Barnett Dam & Reservoir
Failure Bank Full Stage



1" = 4000 feet

PLATE 3

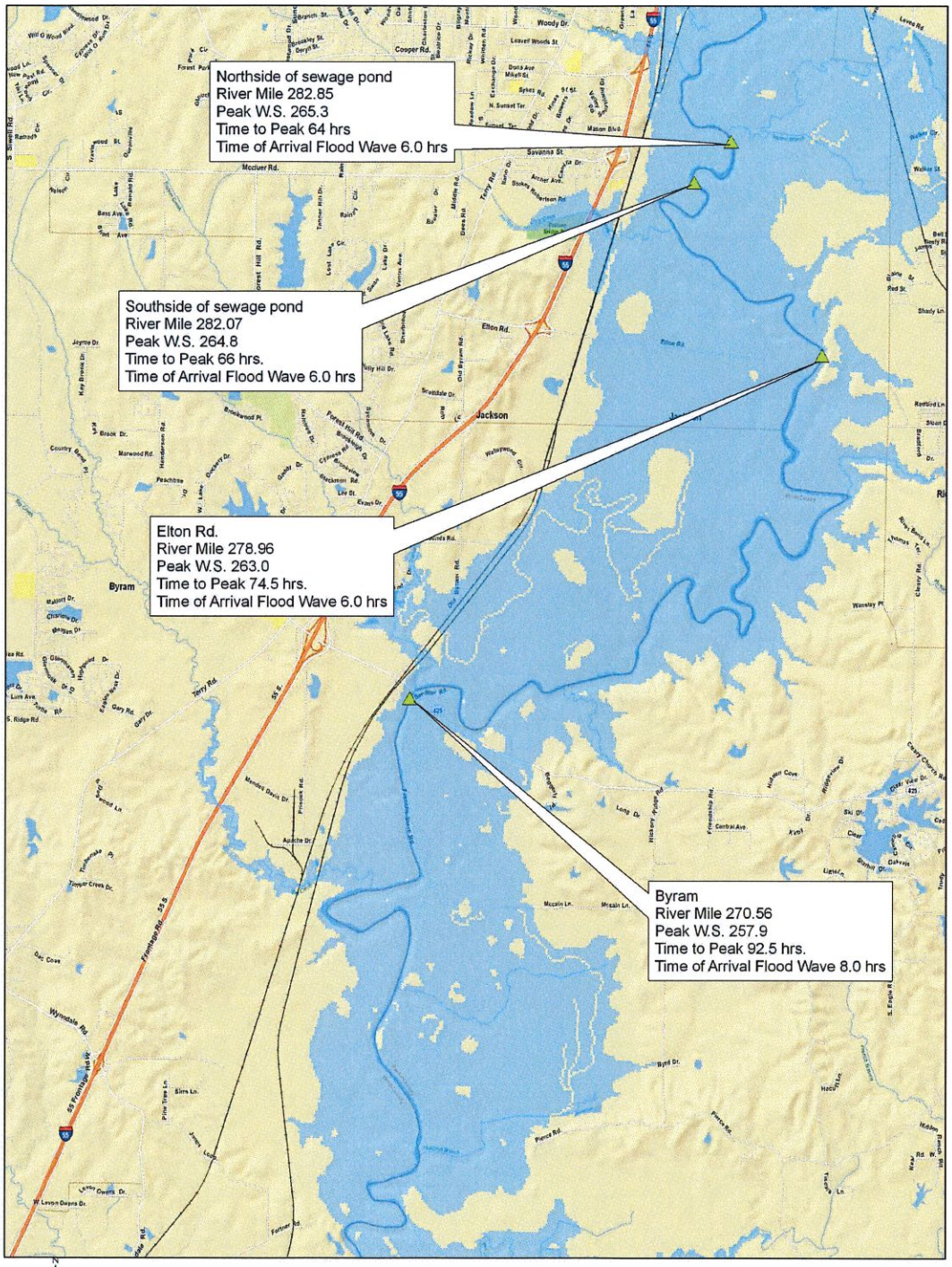
Ross Barnett Dam & Reservoir
Failure Bank Full Stage



1" = 4000 feet

PLATE 4

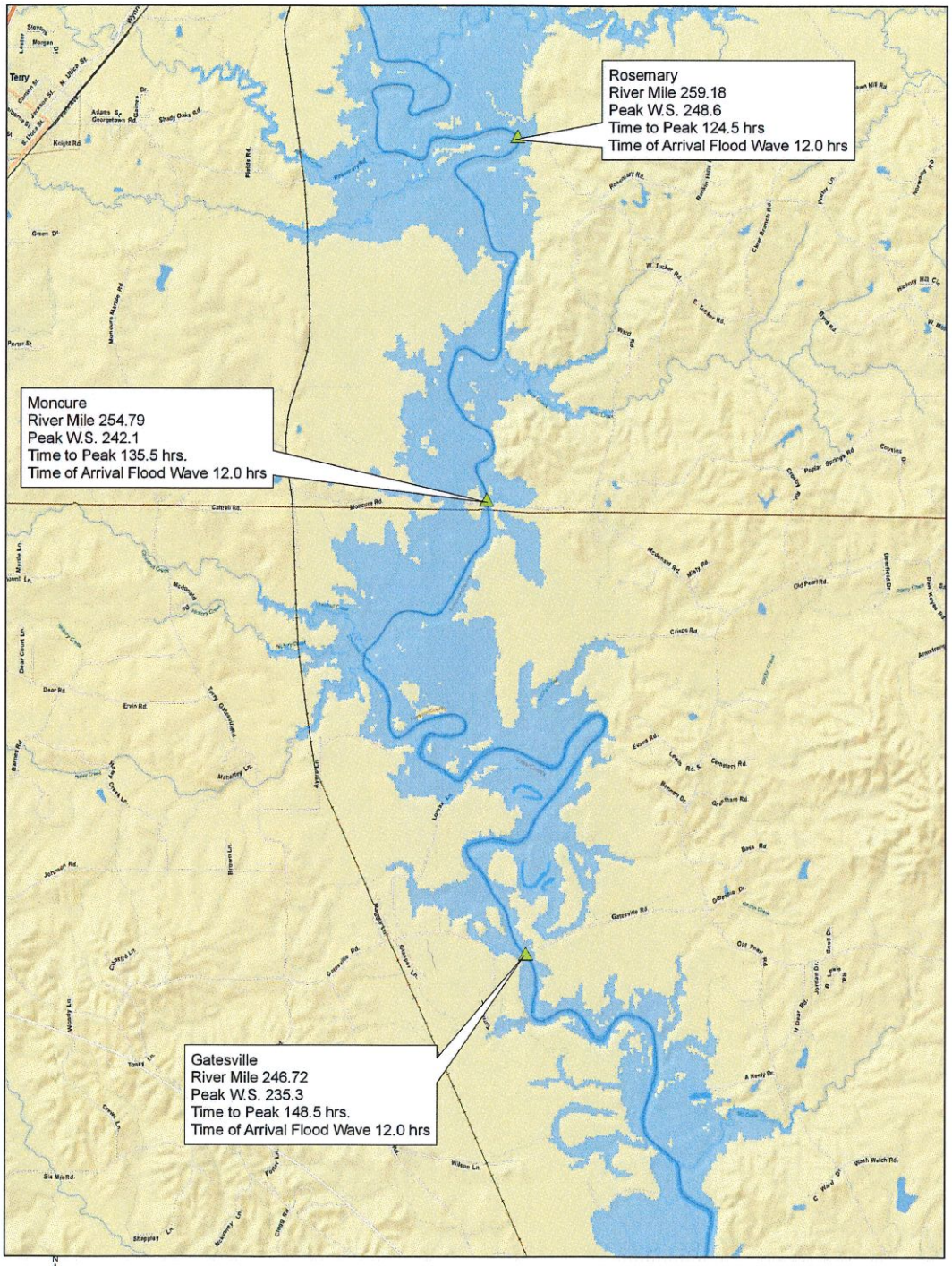
Ross Barnett Dam & Reservoir
Failure Bank Full Stage



1" = 4000 feet

PLATE 5

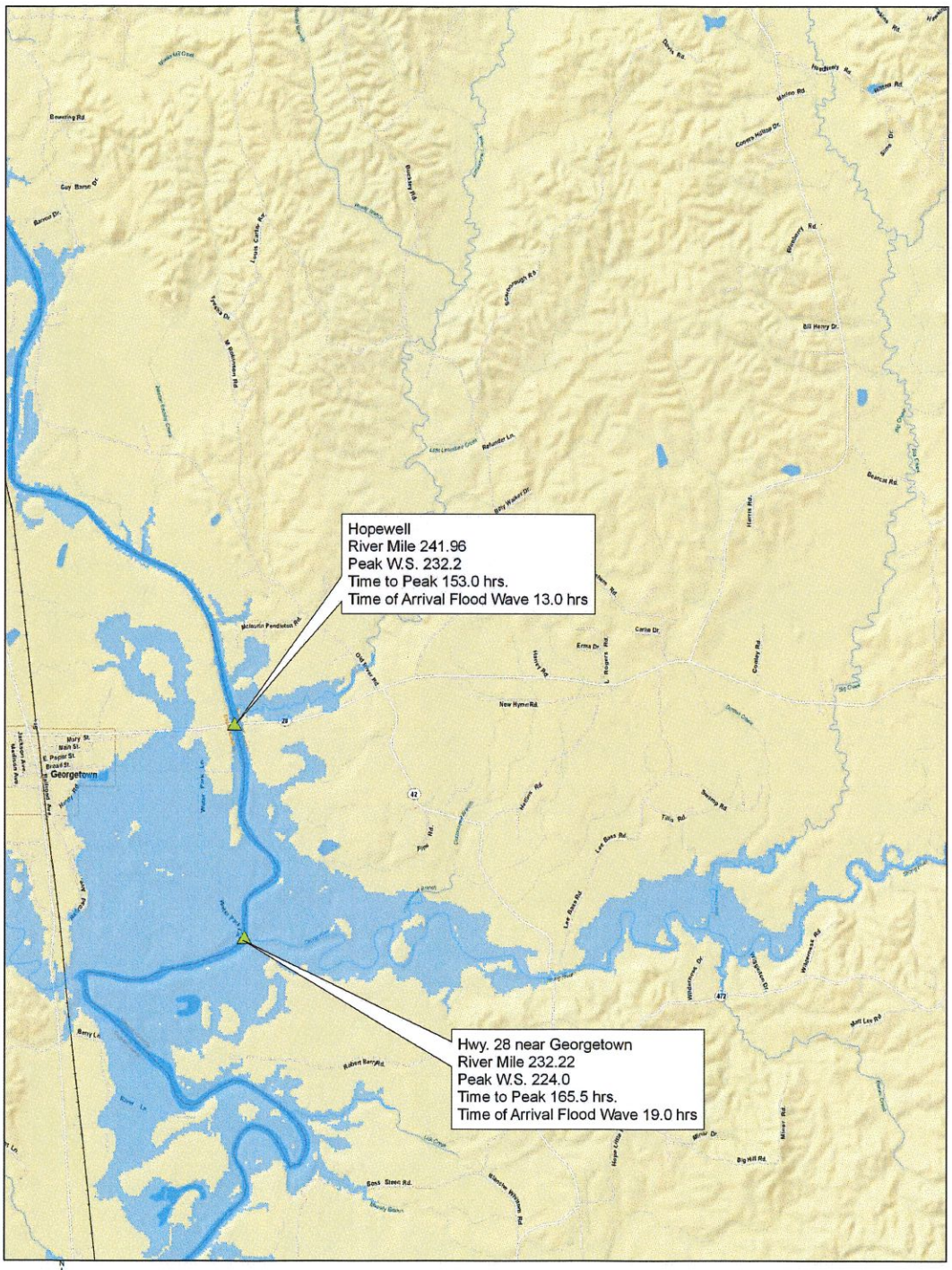
Ross Barnett Dam & Reservoir
Failure Bank Full Stage



1" = 4000 feet

PLATE 6

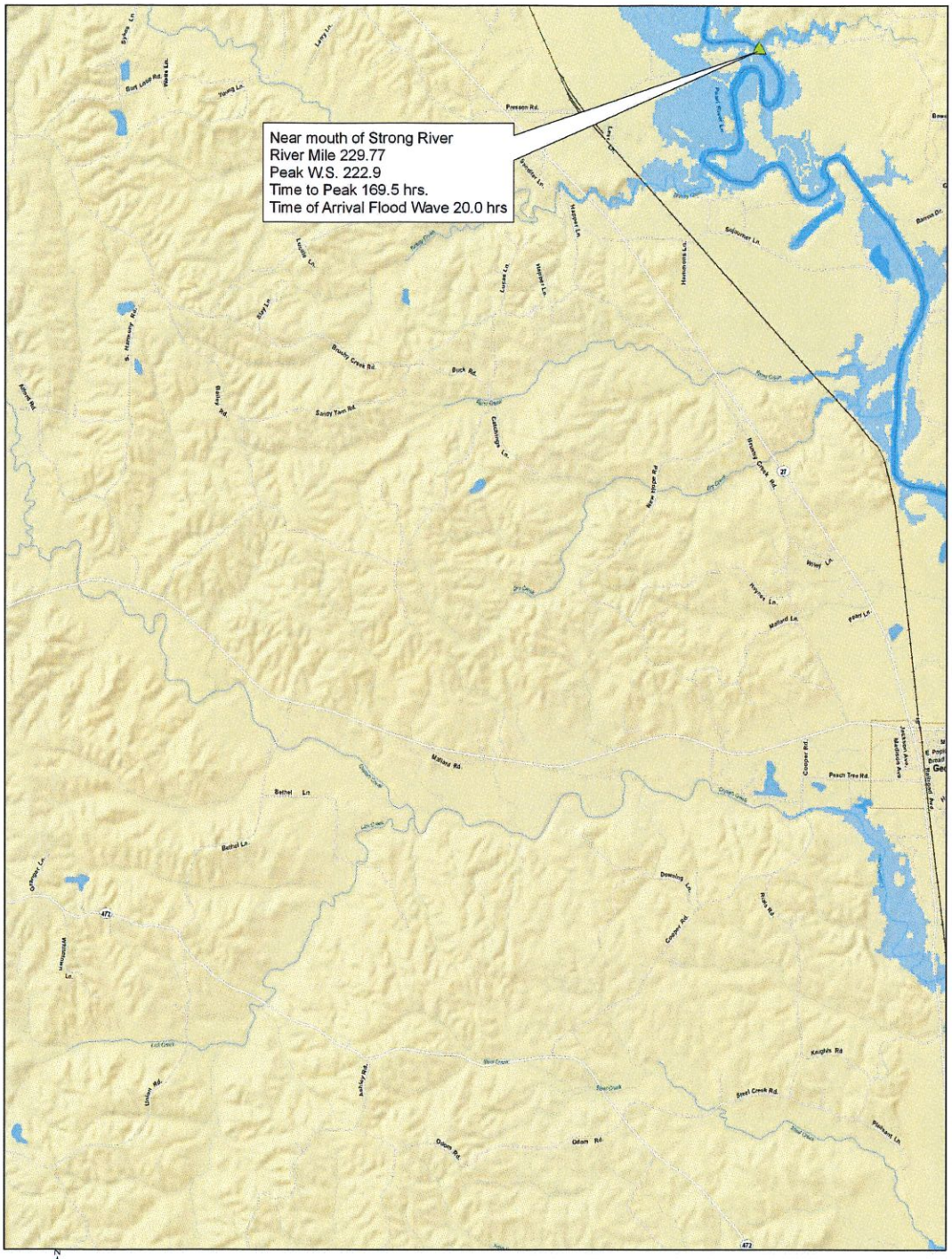
Ross Barnett Dam & Reservoir
Failure Bank Full Stage



1" = 4000 feet

PLATE 7

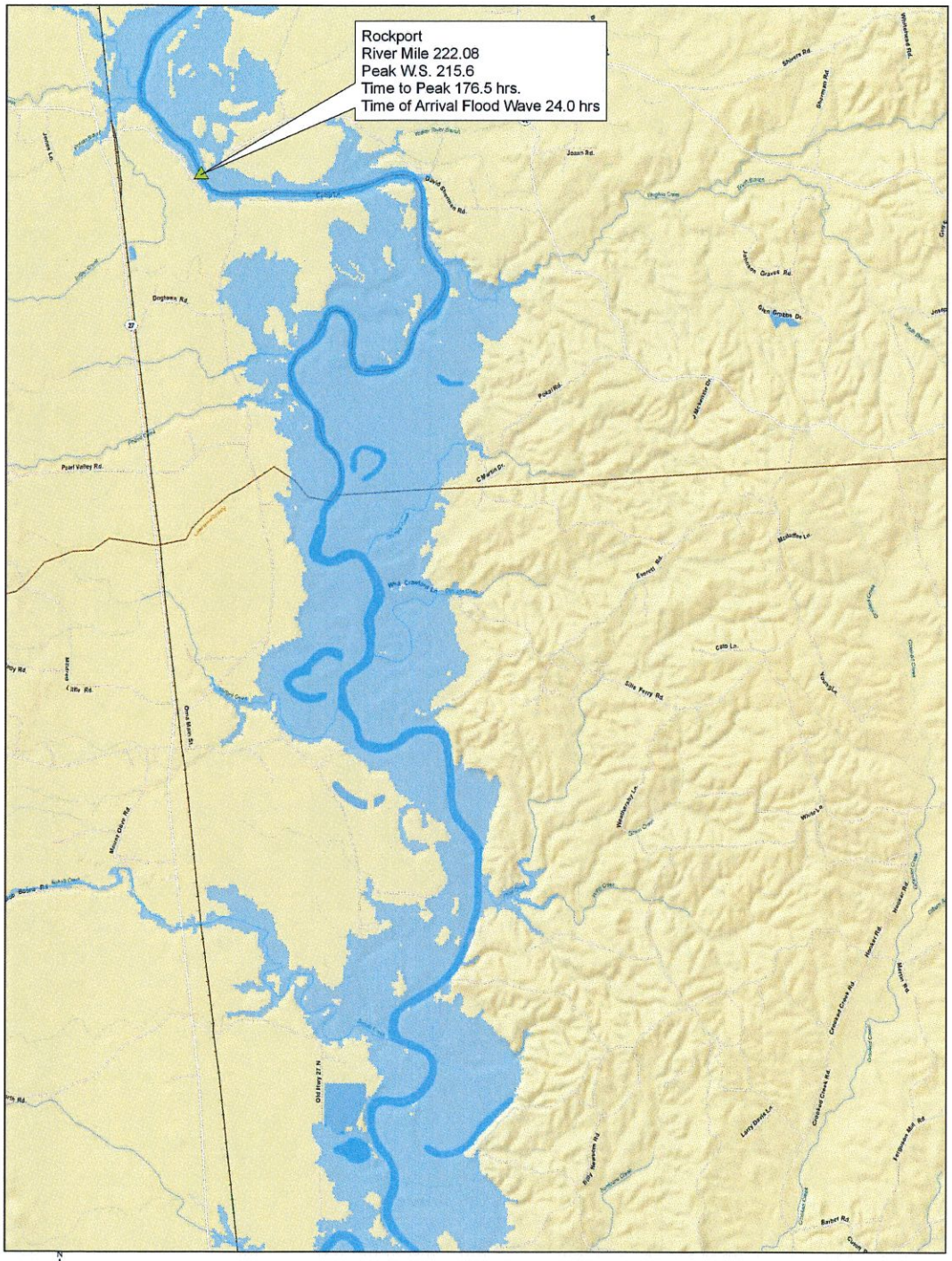
Ross Barnett Dam & Reservoir
Failure Bank Full Stage



1" = 4000 feet

PLATE 8

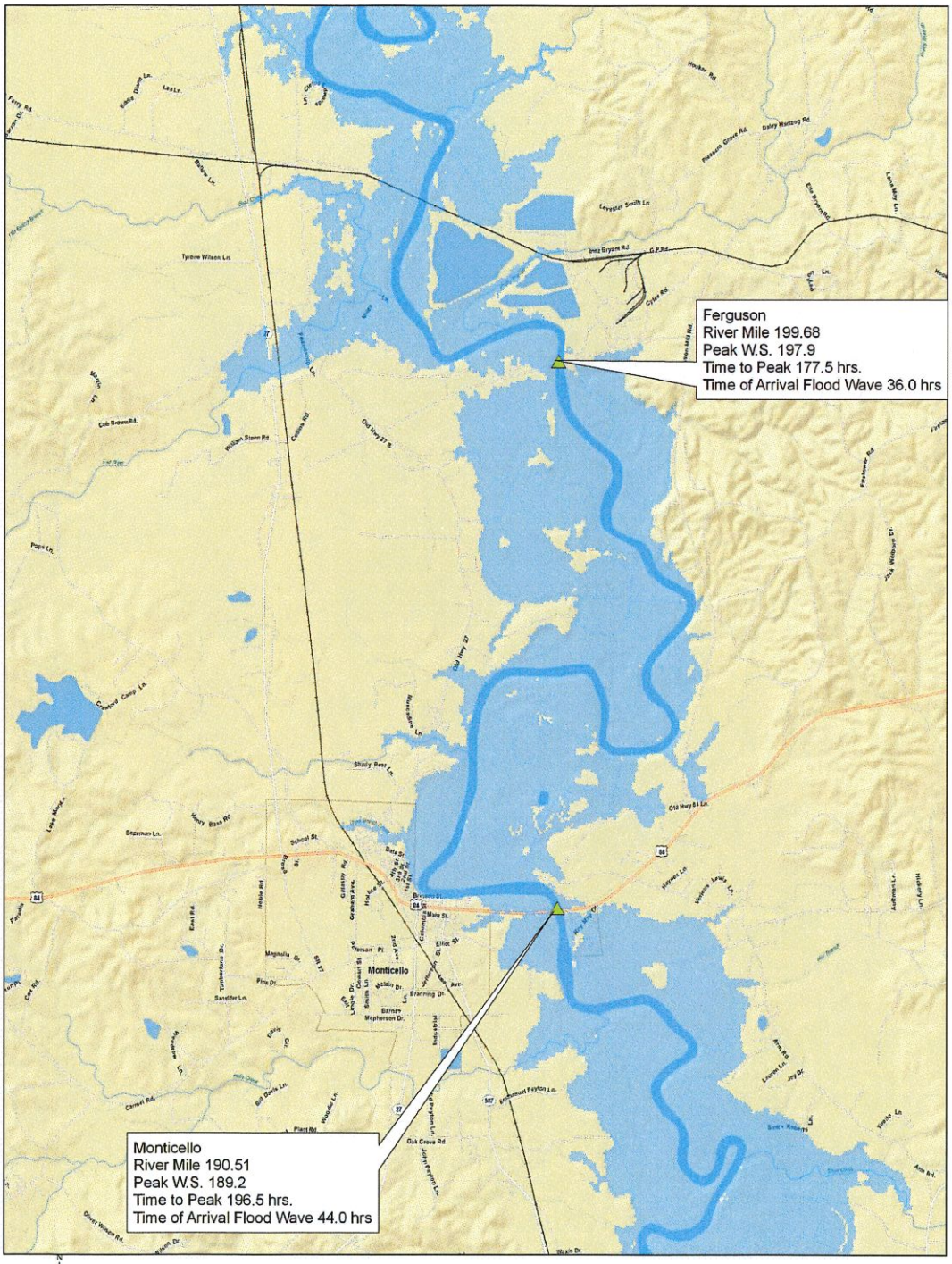
Ross Barnett Dam & Reservoir
Failure Bank Full Stage



1" = 4000 feet

PLATE 9

Ross Barnett Dam & Reservoir
Failure Bank Full Stage



1" = 4000 feet

PLATE 10

2VI. AREAS TO BE EVACUATED

The following areas and roads have been identified as areas that may be impacted by breach at the Dam:

Areas to be evacuated:

- Harbor Pines Mobile Home Community (Madison County)
- Mule Jail Hunting Club (Hinds County)
- Barnett Bend Subdivisions (Rankin County)
- Silverleaf Crossing (Rankin County)
- Oak Grove Drive (Rankin County)
- Post Oak Drive (Rankin County)
- Soccer fields, south of Spillway Road (Rankin County)
- Hog Creek Hunting Club (Rankin County)
- Low-lying areas in Richland around Richland Creek (Rankin County)
- East of Byram, especially around Swinging River Bridge: S. Siwell Rd. / Florence Byram Rd. / Old Byram Rd. (Rankin/Hinds County)
- Low-lying areas in Jackson that will be impacted when Jackson gauge reads 31.0 (Hinds County)
- Savannah Street treatment plant (Hinds County)
- Low-lying areas east of Terry, especially along Rosemary and Moncure Roads (Hinds County)
- Low-lying areas along the Pearl River (Copiah, Simpson and Lawrence Counties)

Roads and Bridges recommended for closure:

- Spillway Road (Pearl River Valley Water Supply District)
- Lakeland Drive at Pearl River bridge (City of Flowood/ City of Jackson)
- Old Brandon Road and Jefferson Street Bridge (City of Flowood/ City of Jackson)
- Railroad bridge near Jefferson Street Bridge (KCS Railroad)
- U.S. Highway 80 Bridge (City of Pearl/ City of Jackson)
- Railroad Bridge, south of I-20
  (Canadian National Gulf Division/ Illinois Central Railroad)
- Low-lying areas in Richland around Richland Creek (Rankin County)
- East of Byram, especially around Swinging River Bridge (Hinds County)
- Low-lying areas in Jackson that will be impacted when Jackson gauge reads 31.0 (Hinds County)
- Savannah Street treatment plant (City of Jackson Public Works Department)
- Low-lying areas east of Terry, especially along Rosemary and Moncure Roads (Hinds County)
- Low-lying areas along the Pearl River (Copiah, Simpson and Lawrence Counties)

VII. RIVER LEVEL IMPACTS

Based on the USGS gage at Pearl River, Jackson, MS, Station No. 02486000 (HWY 80 gauge), the following stage levels will require preventive action by various agencies:

• 13.5 feet river level	Rankin/Hinds/Pearl River Drainage Control District shuts flood control gates along levee.
• 18 feet river level	City of Richland is impacted.
• 21 feet river level	Savannah Sewage Treatment Plant is affected.
• 24 feet river level	The wastewater treatment plant loses its natural outflow and must initiate pumping.
• 26 feet river level	Roads near the river in Lefleur's Bluff State Park begin to flood.
• 28 feet river level	Minor flooding of lowland near the river is occurring. Water begins to backup into several creeks and streams in the Jackson area.
• 29 feet river level	Farmland in Southern Rankin County begins to flood, and water begins to affect home access near the river in the Byram area.
• 30 feet river level	Water is under some homes near the river in the Byram area.
• 31 feet river level	Low-lying areas of Jackson. Water begins to impact approaches to additional homes and businesses in the Byram area.
• 32 feet river level	Water begins to affect businesses on South President and South Fairish streets. Sidney Street is closed.
• 33 feet river level	Rosemary Road is closed. Sidney Street is impassable. There is water on West Street. The playing field off Westbrook Road is underwater. Water is on Nichols and Julienne streets in the Hightower area, but both are passable. Water is approaching Packs Auto Detail Shop on South West Street.
• 35 feet river level	Some businesses are affected near Town Creek.
• 35.4 feet river level	Water begins to enter homes in the Hightower area.
• 35.79 feet river level	Water is close to entering homes in Northeast Jackson.
• 36 feet river level	Harbor Pines Mobile Home Community is affected.
• 38 feet river level	A large number of homes are flooded in Northeast Jackson, and water is in some buildings in downtown Jackson.
• 43.28 feet river level	Major flooding is occurring along the river from Northeast Jackson to Flowood to Richland and Byram.

Note: USGS gauge heights can be found at: http://waterdata.usgs.gov/ms/nwis/current/?type=flow&group_key=huc_cd

VIII. EMERGENCY DETECTION, EVALUATION AND CLASSIFICATION

A. Inspection/Monitoring Plan & Procedures:

The dam is visually inspected weekly by PRVWSD staff under normal conditions. When the water level in the reservoir is between elevations 298.0 ft. and 299.0 ft, the dam is inspected daily. When the water level exceeds 299.0 ft in elevation, the dam is inspected three times per day (early morning, mid-day, and late afternoon). The dam is also inspected immediately following a major flood event.

B. Emergency Classifications:

Four emergency classifications have been identified for Ross Barnett Reservoir Dam:

1. **Advisory:** Conditions that could lead to a failure situation have occurred.
2. **Watch:** Potential for failure exists.
3. **Warning:** Failure could happen at any time.
4. **Emergency:** Uncontrolled release of water.

These emergency classifications are further defined on the following pages.

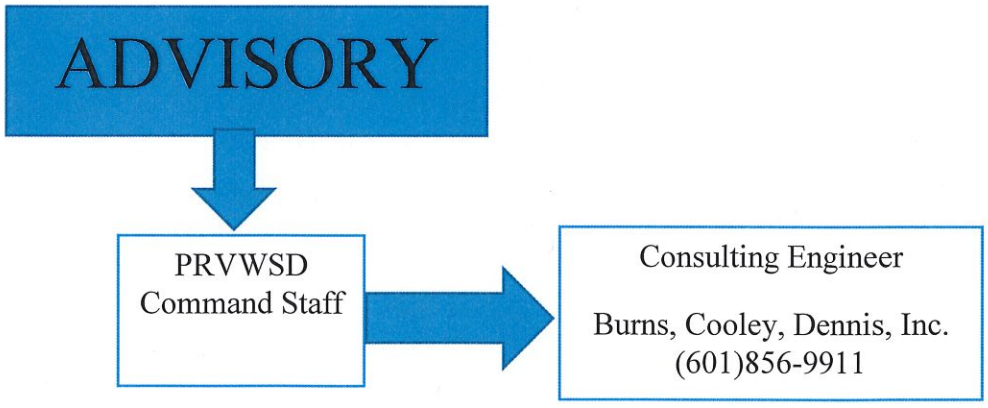
1. Advisory - Conditions that could lead to a failure situation have occurred

Example Conditions That Could Result in an Advisory:

1. Earthquake in vicinity.
2. New seepage area noted.
3. Unexpected increase of water in toe ditch.
4. Excessive rainfall at a magnitude that could cause operational issues at the dam.
5. A slide is noted on the dam face that is not progressing.

On-Site Personnel Plan of Action in an Advisory:

1. Make calls as shown on the below Advisory Flowchart.
2. Monitor situation on a regular basis. Determine along with consulting engineer what next steps to take.
3. If the problem resolves itself or does not further develop, the advisory can be cancelled. If the problem worsens, this situation may should rise to the watch category.



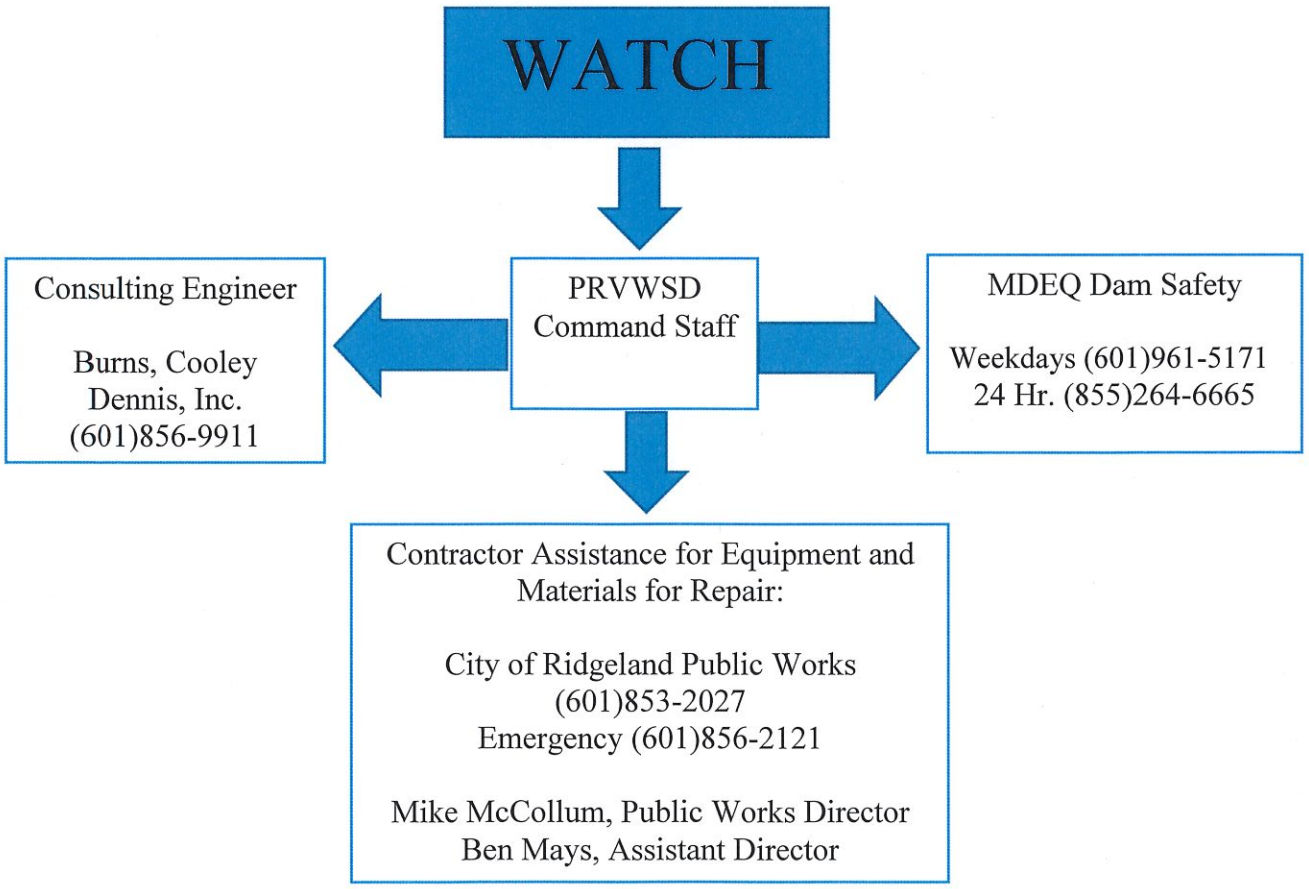
2. **Watch** – Potential for failure exists

Example Conditions That Could Result in a Watch:

1. Advisory conditions have worsened to where immediate corrective action is needed or where the situation should be upgraded to a watch, such as a noted slide is progressing, the volume of water noted from a seepage point has an unexpected increase, or issues are noted on the dam after experiencing an earthquake.
2. A seepage point or large boil develops that is moving material.
3. The water level of the dam nears the starter notch of the emergency spillway.

On-Site Personnel Plan of Action in a Watch:

1. Make calls as shown on the below Watch chart.
2. Take appropriate corrective actions to prevent failure of the dam.
3. Issue watch press release if appropriate (See Pages 5 and 6).



3. **Warning** – Failure could happen at any time

This situation should convey the impression that "some amount of time" is still available for further analyses/decisions to be made before Dam failure is considered to be a foregone conclusion. This is a situation where a failure may eventually occur, but pre-planned actions taken during certain events (such as major floods, earthquakes, evidence of piping) may moderate or alleviate failure. Even if failure is inevitable, more time is generally available than in a "failure has occurred situation" to issue warnings and/or take preparedness actions. When a Dam safety situation is observed that may lead to a failure if left unattended, but there is no immediate danger, the District will issue a warning that a "potential failure situation is developing." The District will assess the situation and determine the urgency of the emergency situation. Based on the District's assessment, the authorities should be placed on alert and it is up to the authorities to determine the appropriate course of action. If it appears that a situation may take days or weeks before it could develop into a failure situation, the local authorities may decide on one course of action.

Periodic status report updates from the owner are important because when it appears that the situation is continuing to worsen at the Dam, in spite of the actions being taken to moderate or alleviate failure, the local authorities may decide to change their course of action. The evacuating agencies should consider the prudence of early evacuation, or heightened awareness, of residents in the inundation area until the emergency situation has passed.

> **NOTE: Discovery of a sand boil or evidence of piping in the Dam face or in the vicinity of the toe of the Dam should cause the observer to immediately expand the area of surveillance to include all areas, particularly areas that are at a lower elevation than the observed problem, within 200 to 250 feet of the downstream toe of the Dam.**

If possible, lowering of the reservoir will be attempted through opening of additional gates. The District, in consultation with their consulting engineer and the Dam Safety Division, will make the determination on lowering of the reservoir and gate operation.

Example Conditions That Could Result in a Warning:

1. The watch level corrective actions do not appear to be resolving the issues at the dam, and the dam continues in the direction of possible failure.
2. A developed seepage point or boil continues to move material despite corrective actions.
3. Piping.
4. Dam overtopping.
5. Major slide that has cut deep into the dam.
6. Failure of tainter or sluice gates at the dam.

On-Site Personnel Plan of Action in a Warning:

1. Make calls as shown on the following Warning flowchart and do as follows:
   - Indicate that the dam could fail at any time.
   - Indicate to the National Weather Service that a Flash Flood Warning should be issued.
   - Remind contacted parties to go to this EAP document for the inundation maps and contact information. Also indicate to those parties that it is time to consider evacuation efforts and notices.
   - Provide a contact name and number that can be called for further information or follow-up questions.
2. Continue to take appropriate corrective actions to prevent failure of the dam.
3. Issue warning press release (See Pages 5 and 6).
4. Close the portion of Spillway Road that crosses the dam.
5. Get boaters off of main lake.

Additional phone numbers can be found under X. Contacts on Pages 33-34.

WARNING

PRVWSD Board of Directors

PRVWSD Command Staff

PRVWSD Control Tower

Rankin County 911

MEMA (800)222-6362

Dept. of Transportation

CN Railroad (800)465-9239

KCS Railroad (877)527-9464

Rankin County EMA

Rankin County First Responders:
Sheriff Dept.
Reservoir Fire Dept.
Emergency Medical

Highway Patrol

Copiah County EMA

Simpson County EMA

Department of Wildlife, Fisheries and Parks

Lawrence County EMA

Louisiana EMS

Consulting Engineer

Burns, Cooley, Dennis, Inc.
(601)856-9911

MDEQ Dam Safety

Weekdays (601)961-5171
24 Hr. (855)264-6665

National Weather Service
(601)936-2189

Contractor Assistance for Equipment and Materials for Repair:

City of Ridgeland Public Works
(601)853-2027
Emergency (601)856-2121

Mike McCollum, Public Works Director
Ben Mays, Assistant Director

Hinds County EMA

Hinds County 911

City of Jackson First Responders:
Police Dept.
Fire Dept.
Emergency Medical
Public Works

City of Jackson EMA

Hinds County First Responders:
Sheriff Dept.
Fire Dept.
Emergency Medical
Public Works

Madison County First Responders:
Sheriff Dept.
Fire Dept.
Emergency Medical
Public Works

City of Ridgeland First Responders:
Police Dept.
Fire Dept.
Emergency Medical
Public Works

City of Ridgeland EMA

Madison County EMA

Madison County 911

4. **Emergency** – Uncontrolled release of water

In this situation, the dam has failed, and there is an uncontrolled release of water.

Generally, this situation should convey the impression that "time has run out" with respect to the failure of the Dam. This is a situation where a failure has occurred, is occurring, or obviously is just about to occur. The question is often asked, "How much time is available when failure is considered to be imminent?" It is impossible to determine how long it will take for a failure to occur or for a complete breach to occur once failure begins. However, the time to breach for Ross Barnett Reservoir Dam has been estimated to be less than one hour. **Therefore, once the owner determines that there is no longer any time available to attempt corrective measures to prevent failure, the "failure is imminent or has occurred" warning should be issued.**

Emergency management agencies, for evacuation purposes, should conservatively interpret the phrase "failure is imminent" to mean that the Dam is failing, i.e., it should not be assumed that there is some time lag between "failure is imminent" and a "failure has occurred." Therefore, "failure is imminent" and "failure has occurred" should conservatively be interpreted as essentially the same condition for evacuation purposes.

Common warning signs of imminent failure are:

1. Whirlpool developing in the lake near the Dam.
2. A major slide of material in either face of the Dam that reaches the top of the slope or extends into the crest of the Dam.
3. Overtopping; and/ or
4. Activation of emergency spillway.

On-Site Personnel Plan of Action in an Emergency:

1. Make the below calls, indicating that the dam is now failing and that downstream residents should be evacuated immediately:
   - Rankin County 911
   - Hinds County 911
   - National Weather Service. Indicate to NWS that that a Flash Flood Warning or Flash Flood Emergency should be issued.
   - Provide a contact name and number that can be called for further information or follow-up questions.
2. Continue to accomplish onsite personnel tasks for Warning classification as noted on Page 28.
3. Issue failure/emergency press release (See Pages 5 and 6).

IX. GENERAL RESPONSIBILITIES UNDER THE PLAN

A. Incident Command

The Incident Commander shall be the General Manager for the Pearl River Valley Water Supply District (District). The chain of command shall be the General Manager, then the Chief Engineer, and then the Reservoir Police Chief. All emergency responders shall maintain their internal chain of command and their commander shall report in to the Incident Commander as per the National Incident Management System.

B. Dam Owner Responsibilities

Upon notification or discovery of the potential for an emergency situation, the District will execute the Notification Flowchart for that level of emergency classification. The contact person at the Dam site is the General Manager, John Sigman, P.E., the Chief Engineer, Greg Burgess, P.E., or the Reservoir Police Chief, Perry Waggener. See Pages 33-34 for Contact List.

C. Responsibility for Evacuation

Warning and evacuation planning are the responsibilities of local authorities who have the statutory obligation. Under the EAP, the District is responsible for initiating the notification flowchart calls when flooding is anticipated or a failure is imminent or has occurred. Police and fire department personnel will be dispatched to the area of potential inundation to establish traffic control points to facilitate evacuation and limit access to the area. The District will not assume, or usurp, the responsibility of local government entities for evacuation of people. However, there may be situations in which routine notification and evacuation will not suffice, as in the case of a resident located just downstream of the Dam. In this case, the District will arrange to notify that person directly. This procedure should be coordinated with the appropriate public officials before an emergency situation develops.

D. Responsibility for Duration, Security, Termination, and Follow-Up

The District and the county EMA will perform on-site monitoring of the situation at the Dam and will keep local authorities informed of developing conditions at the Dam from the time he arrives on site until the emergency has been terminated. The state Dam safety engineer, in consultation with the District and the county EMA is responsible for declaring that the emergency at the Dam is terminated. Following that declaration, the county EMA is responsible for termination of the disaster response activities. A follow-up evaluation after an emergency by all participants is required. The results of the evaluation should be documented in a written report.

E. Exercising and Review of the EAP

This EAP will be reviewed annually for both adequacy and for keeping phone numbers and other information up-to-date. Exercises will be done every few years as determined by the MDEQ Dam Safety Office and PRVWSD. This EAP will be updated promptly after these reviews and exercises. This plan was most recently exercised on March 26, 2015.

X. COMMUNICATION

A. The primary contact number shall be (601)856-6574. The alternate contact number shall be (601)354-3448. The second alternate contact number shall be (601)992-9703.

The primary radio communication frequency for emergency responders shall be the state MSWIN system. A special event talk group will be requested and distributed as soon as the likely-hood of an event is suspected and the talk-group has been confirmed. The alternate radio communication frequency for emergency responders shall be the MSWIN Reservoir Police TAC (Tactical) talk-group. The second alternate radio communication frequency for emergency responders shall be 154.980 MHz (Reservoir radios programmed Channel 3), which will be monitored during a special event.

B. Coordination of Information
The National Weather Service will be notified by the District so that they may monitor flood waves resulting from a Dam break as outlined on pages 16 and 17 for Warnings and Emergencies. The 911 operator should place first responders (Police Departments, Fire Departments, and Emergency Medical Services), the National Weather Service, and the Rankin County EMA, Hinds County EMA, and the Madison County EMA on an initial alert. Thereafter, the county EMA(s) will provide periodic updates on the situation as it develops so that the local agencies can assess when they should implement their evacuation procedures. For example, the county EMA could issue an initial warning and periodic updates on the reservoir level as it rises during flood conditions and eventually overtops an embankment Dam. During this period, the National Weather Service would issue flash flood advisories or warnings. As the Reservoir rises, a warning should be implemented with periodic updates on how much time is available before the embankment overtops. Immediately before the embankments overtops, an emergency should be issued.

C. Media Response
Media response shall be handled through the Public Information Officer (PIO). The PIO shall be designated by the Incident Commander from PRVWSD personnel. Further information on media relations and releases can be found on Pages 5 and 6.

XI. CONTACT LIST

Pearl River Valley Water Supply District

115 Madison Landing Circle
P.O. Box 2180
Ridgeland, MS 39158
(601)856-6574

John Sigman, P.E., General Manager
(601)605-6897

Susan McMullan, Deputy Director
(601)605-6880

Greg Burgess, Chief Engineer
(601)605-6896 or (769)218-7202

Michael Lang, Engineer
(601)605-6890

Perry Waggener, Reservoir Police Chief
(601)992-9894

Control Tower (601)992-9703

Burns, Cooley, Dennis, Inc.
David Dennis, P.E. (601)856-9911

Department of Environmental Quality
Dam Safety Division
Weekdays (601)961-5171
24 Hrs. (855)264-6665

Dusty Myers (601)961-5207

City of Ridgeland

Public Works
Mike McCollum, Public Works Director
Ben Mays, Assistant Public Works Director
(601)853-2027
Emergency (601)856-2121

Fire Department (601)856-6811
Police Department (601)856-1212

National Weather Service (601)936-2189

Rankin County EMA (601)825-1499

Madison County EMA (601)859-4188

Hinds County EMA (601)960-1476

City of Jackson

Jerriot Smash, Public Works Director
(601)960-2091
After Hours (601)960-1875

Fire Dept. (601)960-2093 or
(601)960-0311

Police Department (601)960-1234

Savannah St. Wastewater Treatment Plant
(601)960-1875 or (601)960-2090

OB Curtis Drinking Water Plant
(601)957-7061

MEMA
(601)933-6362
(800)222-6362

MS Highway Patrol (601)987-1212

Copiah County EMA (601)894-1658
Dispatch Fax (601)894-7676

Lawrence County EMA (601)587-7664

Simpson County EMA (601)847-3434

Louisiana Bureau of EMS
(844)452-2367

MS Dept. of Transportation
(601)359-7001

David Foster, P.E., District V Engineer
(601)683-3341

Canadian National Railroad
(800)465-9239

Kansas City Southern Railroad
(877)527-9464

Pearl River Drainage Control District
(Rankin/Hinds)
(601)335-1743
(601)624-8988

MS Dept. of Wildlife, Fisheries & Parks

Communications Center (601)432-2170

Larry Castle (601)432-2001 or
(601)540-8619

Major Chris Harris (601)859-3421 or
(601)672-5271

Captain Scottie Jones (601)432-2186 or
(662)571-5558

APPENDIX

Hydrology and Hydraulics

NOTE: FOR OFFICIAL USE ONLY

It should be noted that the analysis of this report is based in the computer modeling of various Dam failures; actual failure conditions may vary from the findings presented in this report. This should be used for estimation purposes only!

HYDROLOGY AND HYDRAULICS

SELECTED EMERGENCY CONDITIONS. Three hypothetical flow conditions were investigated to determine the hydraulic performance and provide technical guidance for the development of the Flood Emergency Plan for the Ross Barnett Reservoir and the Dam. Specifically, the numerical model provided the data necessary to evaluate and develop satisfactory Dam emergency plans relative to Dam failure and spillway discharges sufficiently large to cause flooding in the downstream reaches. Two of the flow conditions represent a normal lake level and a low level of discharge from the reservoir approximating a stage of 13.5 on the Jackson gauge. These scenarios are titled "Sunny Day" events and are described below. Another flow condition represents 31.0 on the Jackson gauge where historically water begins to impact homes and business in and around the Jackson area. This scenario is titled "Bank Full" and is also described below.

1. The Sunny Day West event simulates a failure near the western end of the Dam. The level of the reservoir is 297.0 ft NGVD with a simulated 50 ft breach.
2. The Sunny Day East event simulates a failure of the emergency spillway. The level of the reservoir is 297.0 ft NGVD with a simulated failure of the entire spillway, 700 feet.
3. The third flow condition investigated simulates an approximate Bank Full condition on the Pearl River with a reading on the Jackson gage of about 31.0. The level of the reservoir is 300 ft NGVD. The simulated breach is located approximately in the middle of the Dam with a width of 50 feet.

COMPUTATION OF OUTFLOW HYDROGRAPHS. Outflow hydrographs were computed for the above hypothetical cases using the Hydrologic Engineering Center's River Analysis System (HEC-RAS) unsteady flow program. Simulations were conducted for piping failure of the Dam embankment. The piping failure was initiated by the formation of a breach that developed over a specified period of time, one (1) hour, enlarging until complete failure occurs. The reservoir at elevation 300.0 was used for the water-surface elevation at the beginning of the bank-full dam break. Normal pool elevation was used for the sunny day events. TABLE 1 describes the principle parameters used in the computational procedures for the three cases investigated.

ROUTING OF OUTFLOW HYDROGRAPHS. The computed outflow hydrographs were then routed through the downstream river valley to determine the extent and time, of occurrence of flooding.

The Bank-Full event breach was located at the center of the Dam. The results show very little to no impact on residential or commercial areas downstream of the Dam with the flooding raising the Jackson gauge 2.5 feet. The impacted areas can be seen on Plates 2-10.

The Sunny Day East event breach focused on failure of the entire emergency spillway on the east end of the Dam. The results show very little to no impact on residential or

commercial areas in the vicinity with the flooding raising the Jackson gauge to 21.0 feet. The impacted area can be seen on Plate 11.

The Sunny Day West event breach was located near the mobile home park on the west end of the Dam. The results show very little to no impact on the park with the flooding raising the Jackson gauge to 15.9 feet. The impacted area can be seen on Plate 12.

The results of these routings are tabulated in TABLES 2 through 4.

PREPARATION OF INUNDATION MAPS. The results of downstream flood routings were used to establish the limits and plot of inundated areas for emergency conditions associated with bank-full and sunny-day normal pool. The maps were produced to identify clearly the area which would be flooded if the hypothesized emergencies occurred.

TABLE 1

INFORMATION ON COMPUTATION OF OUTFLOW HYDROGRAPHS
ROSS BARNETT DAM AND LAKE

	Bank Full Event	Sunny Day West Event	Sunny Day East Event
Conditions Initial Pool Elev. (ft. NGVD)	300.0	297.0	297.0
Inflow (cfs)	29,000	4700	4700
Breach Type	Piping	Piping	Piping
Pool Elevation when Failure Begins (ft. NGVD)	300.0	297.0	297.0
Maximum Flow through Breach (cfs)	21000.0	7700.0	27000.0
Bottom Width of Breach (ft.)	50	50	700
Bottom Elevation of Breach (ft. NGVD)	272	283	291
Side Slope of Breach	1V:0.5H	1V:0.5H	1V:0.5H
Time to Breach Develop (hrs)	1	1	1

TABLE 2

PEAK STAGE DATA
FOR FAILURE OF ROSS BARNETT DAM
BANK FULL EVENT WITH 29000 CFS AS INFLOW

Location and River Mile	Maximum Elevation (ft. NGVD)	Initial Water Surface Elevation (ft. NGVD)	Time Maximum Elevation (hrs)	Time Arrival of Flood Wave (hrs)
Initially D/S of Dam (301.76)	279.2	277.2	25	1.5
Purple Creek (297.21)	277.5	275.8	32.5	1.5
Meadowbrook Rd (294.08)	274.1	269.9	45.5	2.5
U.S. Lakeland (292.93)	273.3	269.3	47	3.5
Railroad (290.75)	271.9	268.0	49.5	4.0
Fortification St. (289.78)	270.7	266.8	51.5	4.5
High St. (289.34)	270.3	266.5	52	5.0
Interstate 55 (288.43)	269.2	265.7	53.5	5.0
Railroad (287.60)	268.4	265.0	55	5.0
Hwy. 80 (287.21)	267.1	264.6	56.5	5.0
Interstate 20 (286.82)	267.4	264.3	57.5	5.0
Railroad (286.48)	267.2	264.1	58	5.5
North side of sewage pond (282.85)	265.3	262.3	64	6.0
South side of sewage pond (282.07)	264.8	261.6	66	6.0
Elton Rd. (278.96)	263.0	259.6	74.5	6.0
Byram (270.56)	257.9	253.6	92.5	8.0
Rosemary (259.18)	248.6	242.8	124.5	12.0
Moncure (254.79)	242.1	236.5	135.5	12.0
Gatesville (246.72)	235.3	230.1	148.5	12.0
Hopewell (241.96)	232.2	227.4	153	13.0
Hwy. 28 near Georgetown (232.22)	224.0	221.4	165.5	19.0
Near mouth of Strong River (229.77)	222.9	220.3	169.5	20.0
Rockport (222.08)	215.6	213.1	176.5	24.0
Ferguson (199.68)	197.9	196.1	177.5	36.0
Monticello (190.51)	189.2	187.7	196.5	44.0

TABLE 3

PEAK STAGE DATA
FOR FAILURE OF ROSS BARNETT DAM
SUNNY DAY WEST EVENT WITH 4700 CFS AS INFLOW

Location and River Mile	Maximum Elevation (ft. NGVD)	Initial Water Surface Elevation (ft. NGVD)	Time Maximum Elevation (hrs)	Time Arrival of Flood Wave (hrs)
Initially D/S of Dam (301.76)	267.9	263.4	13.5	1.0
Purple Creek (297.21)	266.9	262.6	14	1.5
Meadowbrook Rd (294.08)	260.2	254.9	24	2.0
U.S. Lakeland (292.93)	259.4	254.1	24	2.0
Railroad (290.75)	258.0	252.5	24.5	2.5
Fortification St. (289.78)	256.2	250.3	26.5	3.0
High St. (289.34)	255.8	249.8	27.5	3.0
Interstate 55 (288.43)	255.3	249.2	27.5	3.0
Railroad (287.60)	254.5	247.7	28	3.5
Hwy. 80 (287.21)	254.1	247.2	28.5	3.5
Interstate 20 (286.82)	253.8	246.9	30	3.5
Railroad (286.48)	253.4	246.3	30	3.5
North side of sewage pond (282.85)	250.8	243.5	30	4.0
South side of sewage pond (282.07)	250.0	242.9	30.5	4.5
Elton Rd. (278.96)	244.9	239.0	35.5	5.5
Byram (270.56)	236.9	229.3	37	6.0

TABLE 4

PEAK STAGE DATA
FOR FAILURE OF ROSS BARNETT DAM
SUNNY DAY EAST EVENT WITH 4700 CFS AS INFLOW

Location and River Mile	Maximum Elevation (ft. NGVD)	Initial Water Surface Elevation (ft. NGVD)	Time Maximum Elevation (hrs)	Time Arrival of Flood Wave (hrs)
Initially D/S of Dam (301.76)	273.7	263.4	17	0.5
Purple Creek (297.21)	272.8	262.5	17.5	1.0
Meadowbrook Rd (294.08)	266.0	254.8	23.5	1.5
U.S. Lakeland (292.93)	265.1	254.0	24	1.5
Railroad (290.75)	263.7	252.4	25	2.0
Fortification St. (289.78)	261.9	250.2	27	2.5
High St. (289.34)	261.5	249.7	27	2.5
Interstate 55 (288.43)	260.9	249.1	28	2.5
Railroad (287.60)	260.3	247.6	28.5	2.5
Hwy. 80 (287.21)	259.8	247.3	29	2.5
Interstate 20 (286.82)	259.4	246.8	30	2.5
Railroad (286.48)	259.2	246.2	30	3.0
North side of sewage pond (282.85)	256.8	243.2	33	3.0
South side of sewage pond (282.07)	256.3	242.7	33.5	3.5
Elton Rd. (278.96)	252.4	238.9	35.5	4.5
Byram (270.56)	245.6	229.3	38	6.0

Ross Barnett Dam & Reservoir
Failure Bank Full Stage
Inundation Maps
Index

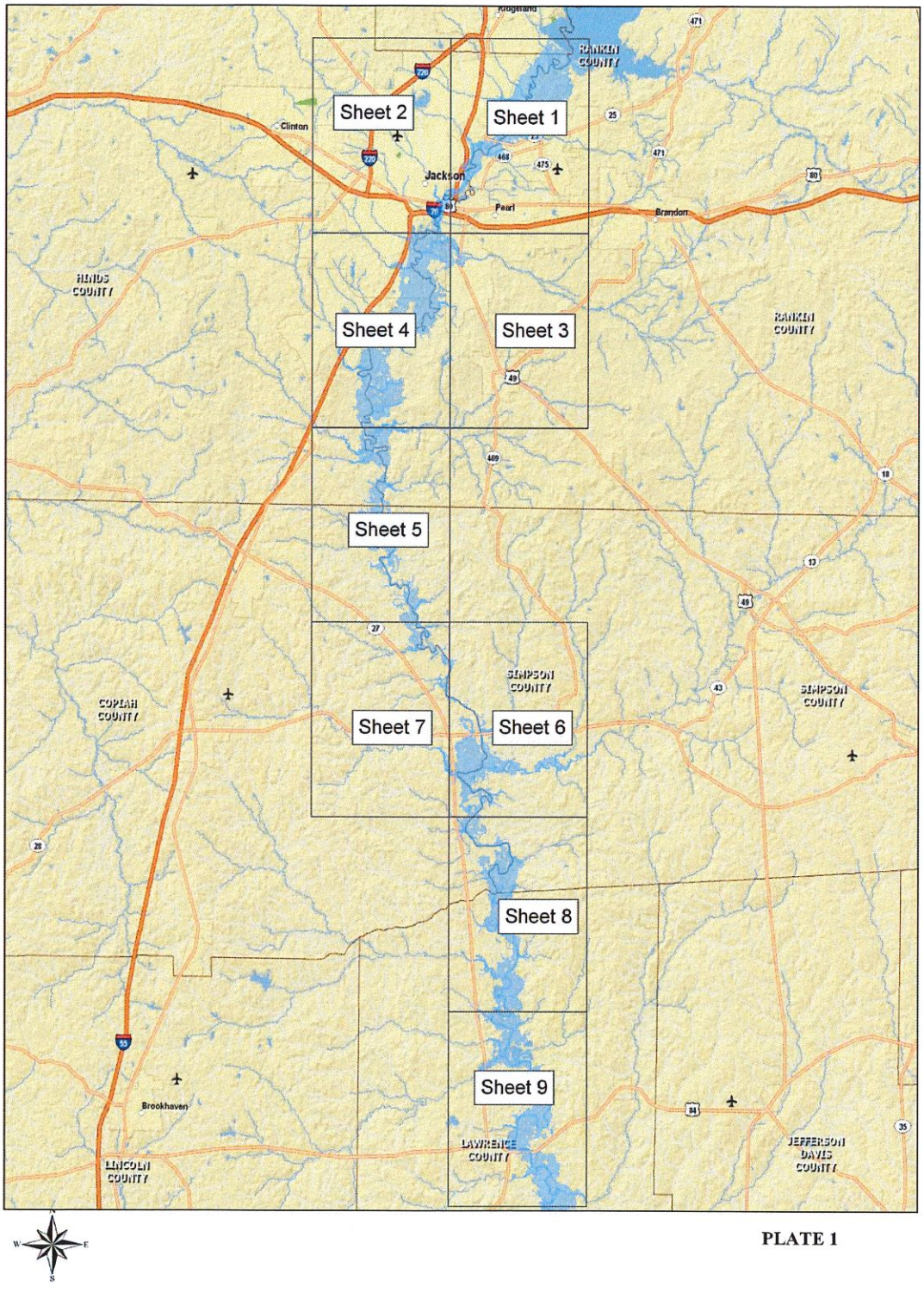


PLATE 1

Ross Barnett Dam & Reservoir
Failure Bank Full Stage

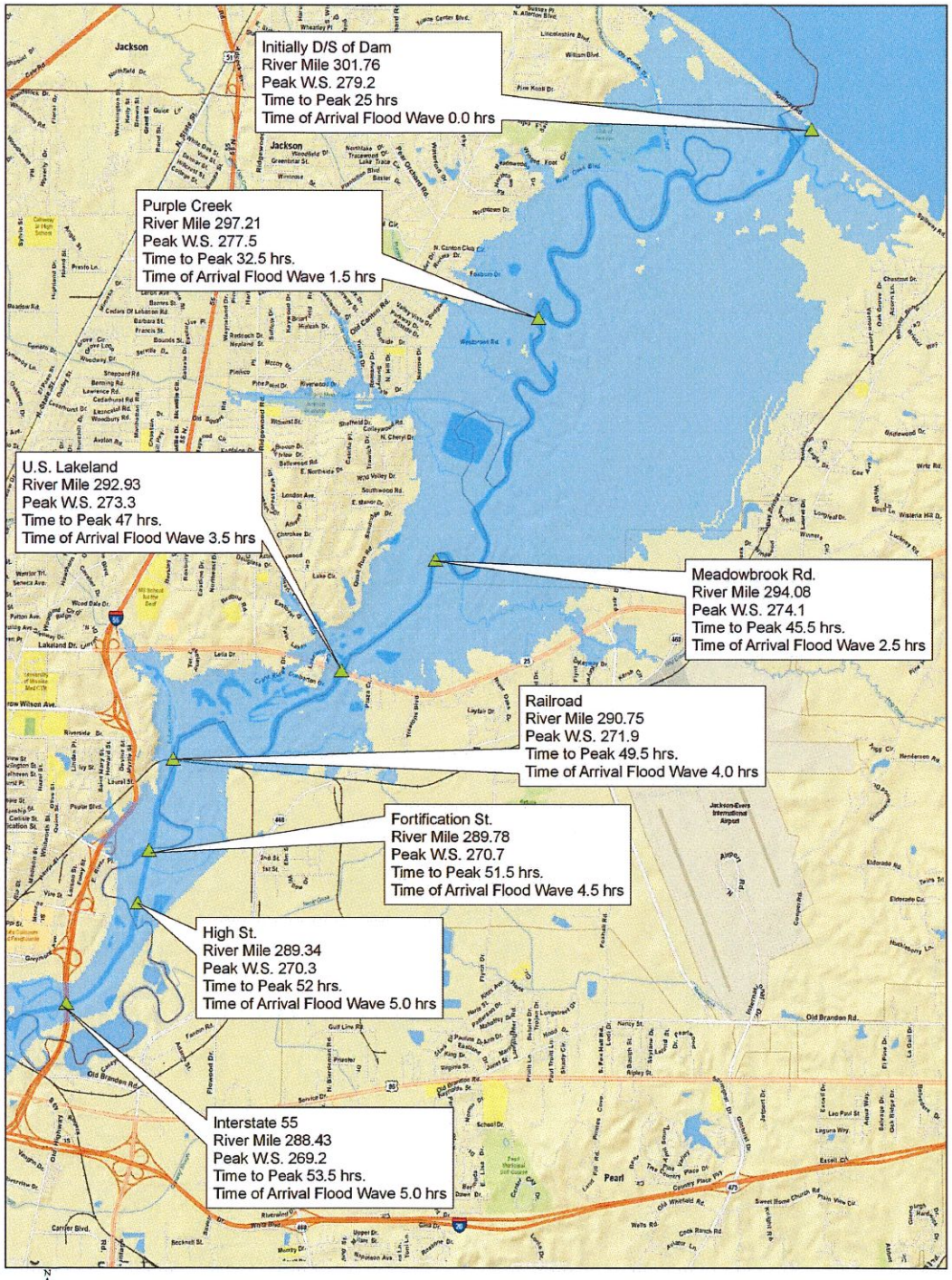
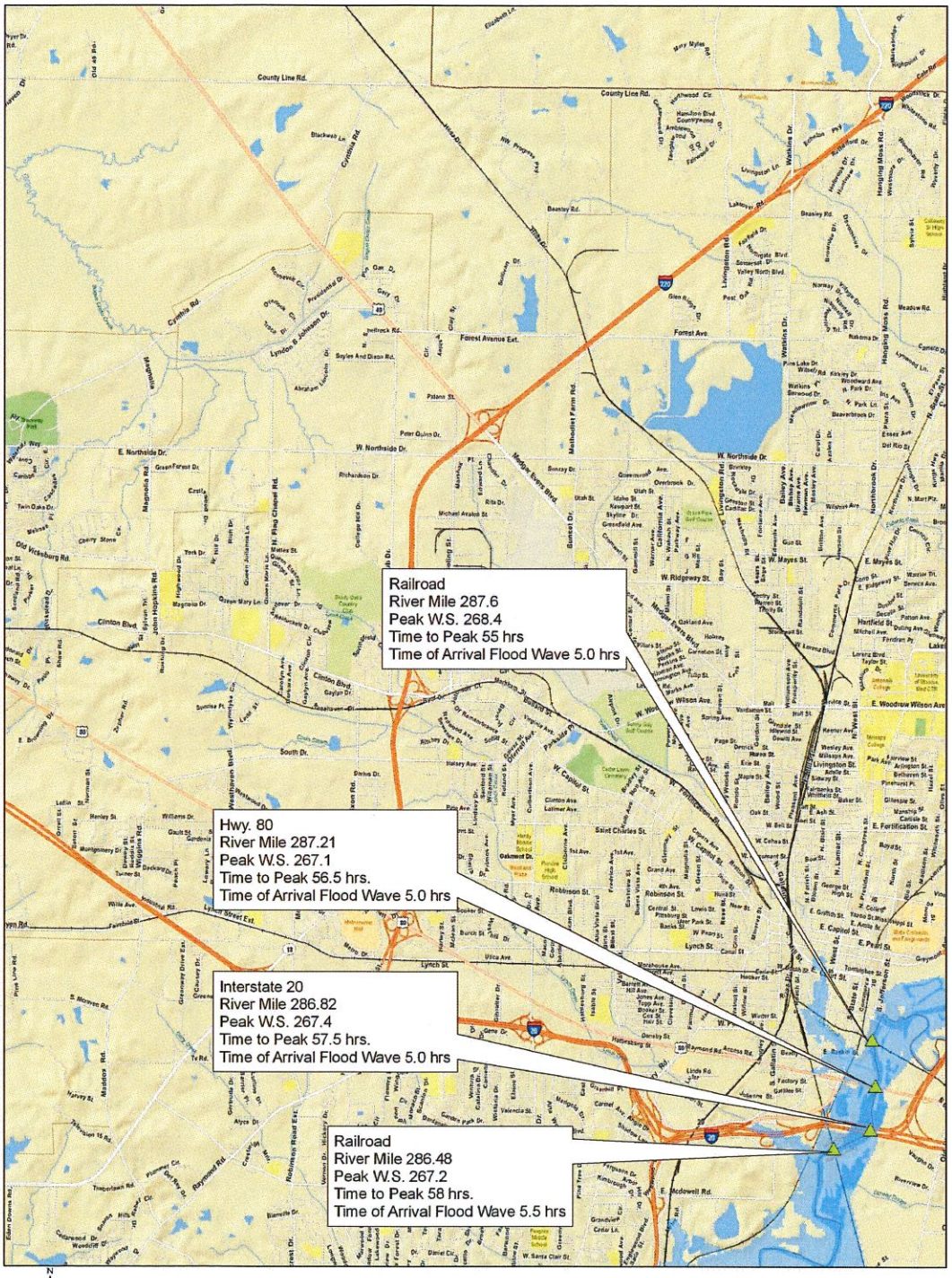


PLATE 2

1" = 4000 feet

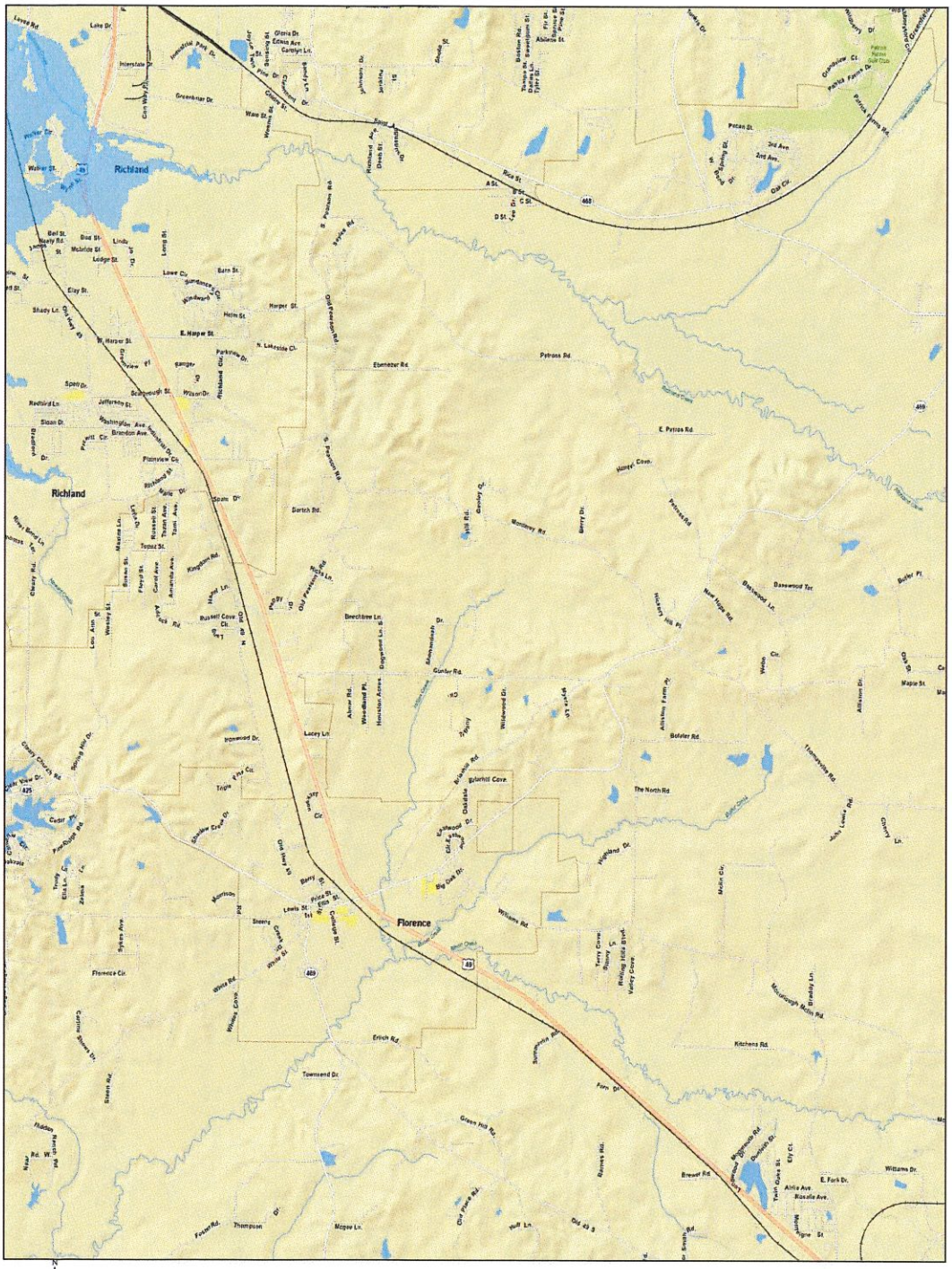
Ross Barnett Dam & Reservoir
Failure Bank Full Stage



1" = 4000 feet

PLATE 3

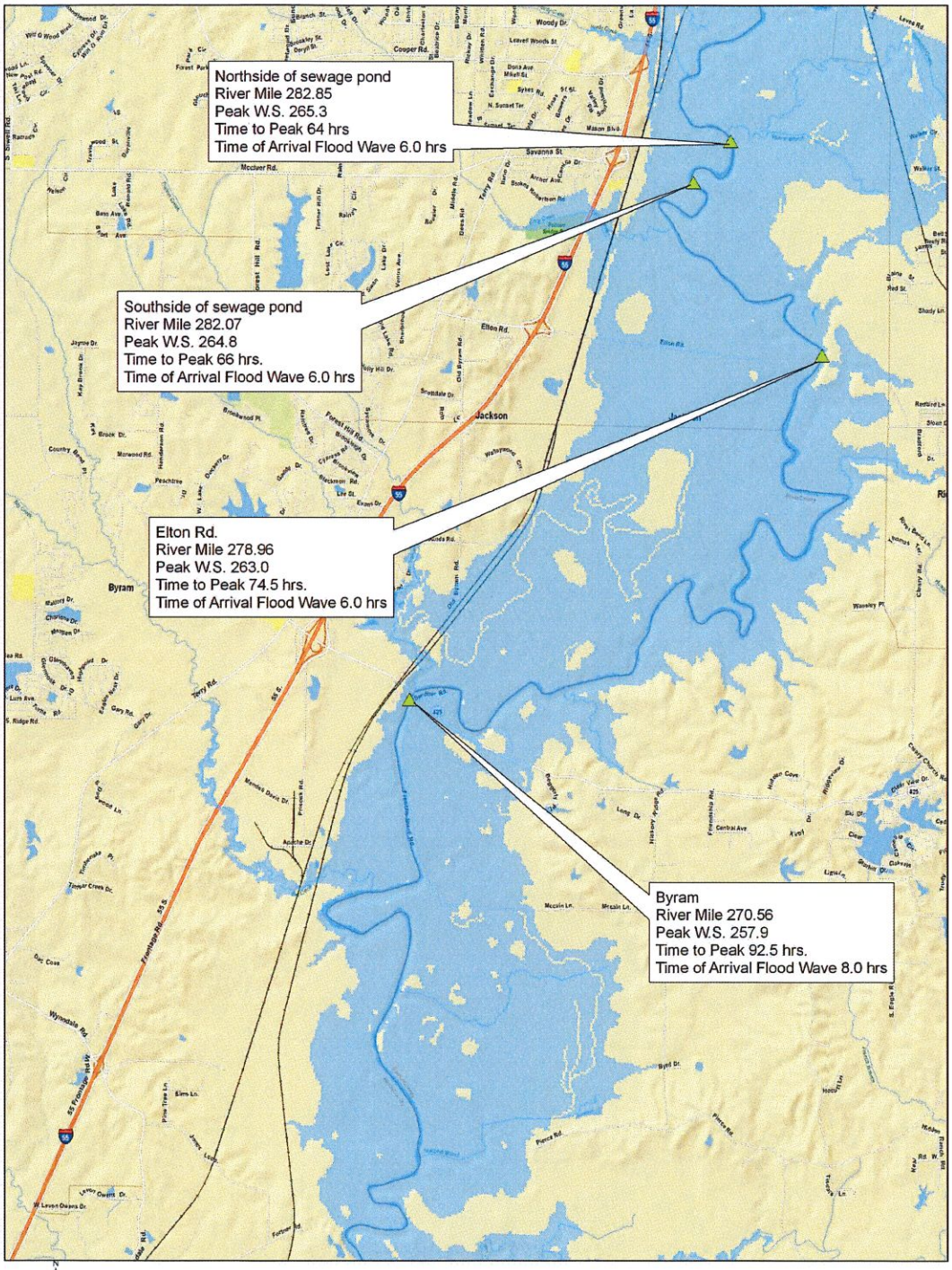
Ross Barnett Dam & Reservoir
Failure Bank Full Stage



1" = 4000 feet

PLATE 4

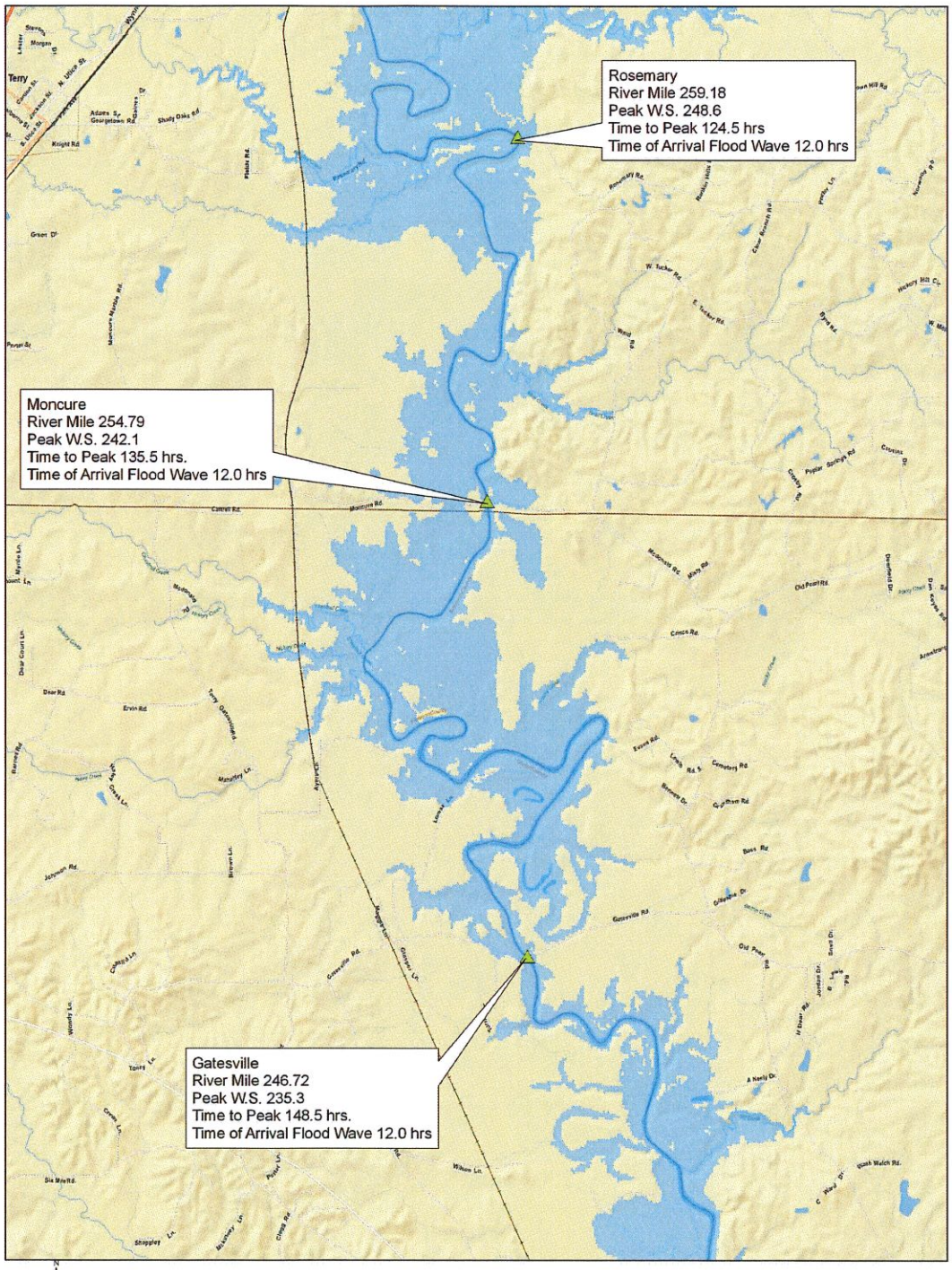
Ross Barnett Dam & Reservoir
Failure Bank Full Stage



1" = 4000 feet

PLATE 5

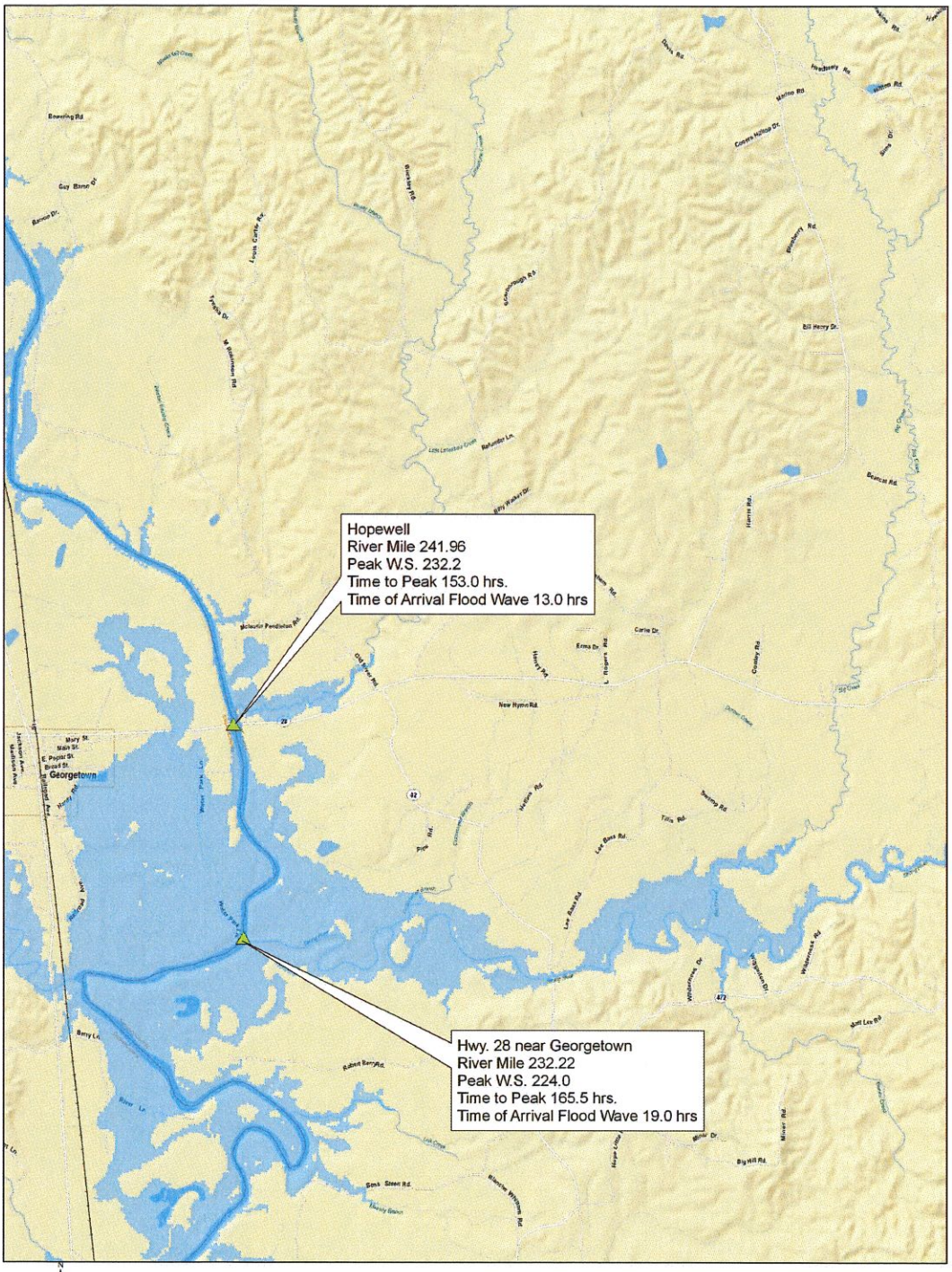
Ross Barnett Dam & Reservoir
Failure Bank Full Stage



1" = 4000 feet

PLATE 6

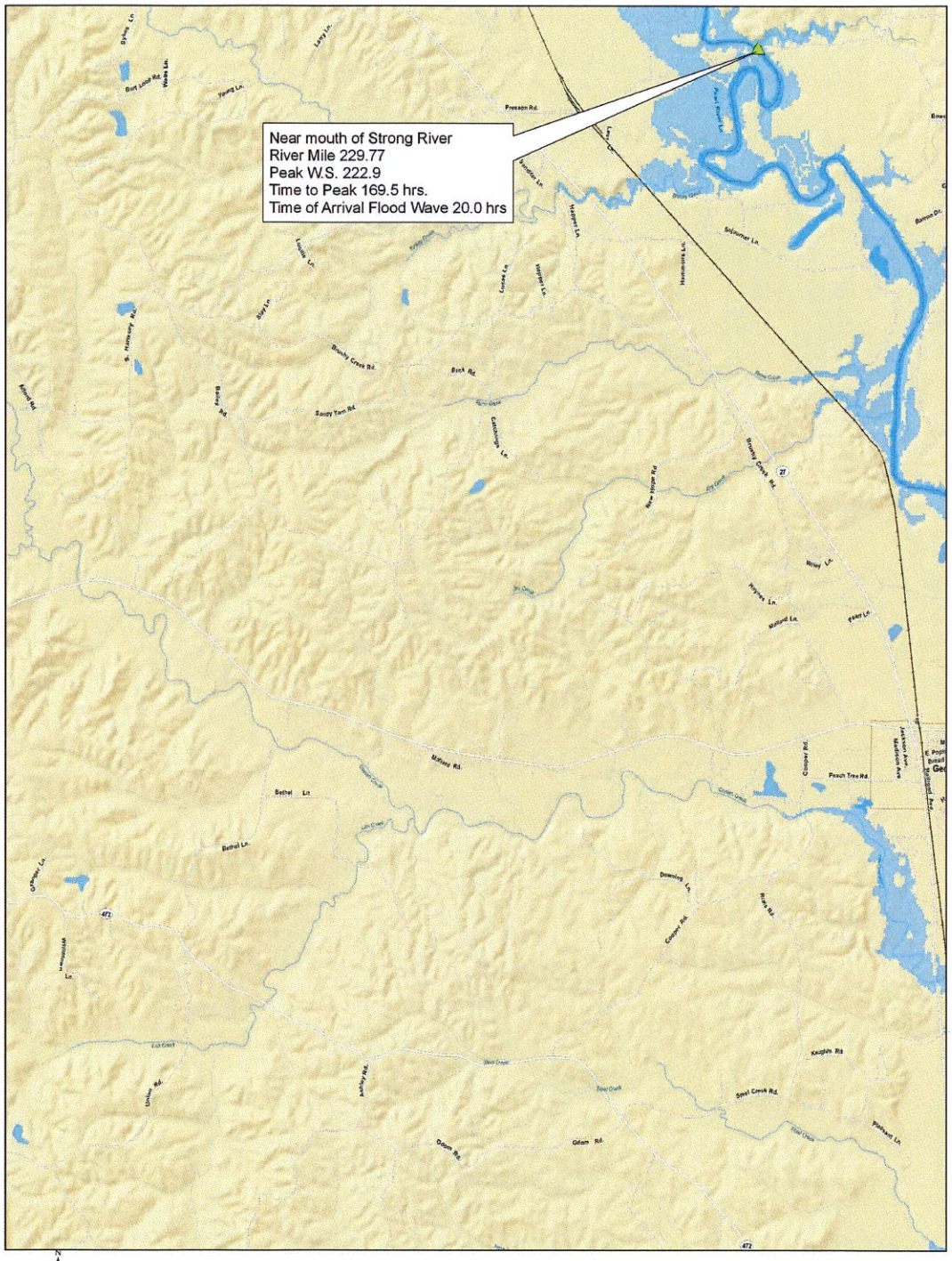
Ross Barnett Dam & Reservoir
Failure Bank Full Stage



1" = 4000 feet

PLATE 7

Ross Barnett Dam & Reservoir
Failure Bank Full Stage



1" = 4000 feet

PLATE 8

Ross Barnett Dam & Reservoir
Failure Bank Full Stage

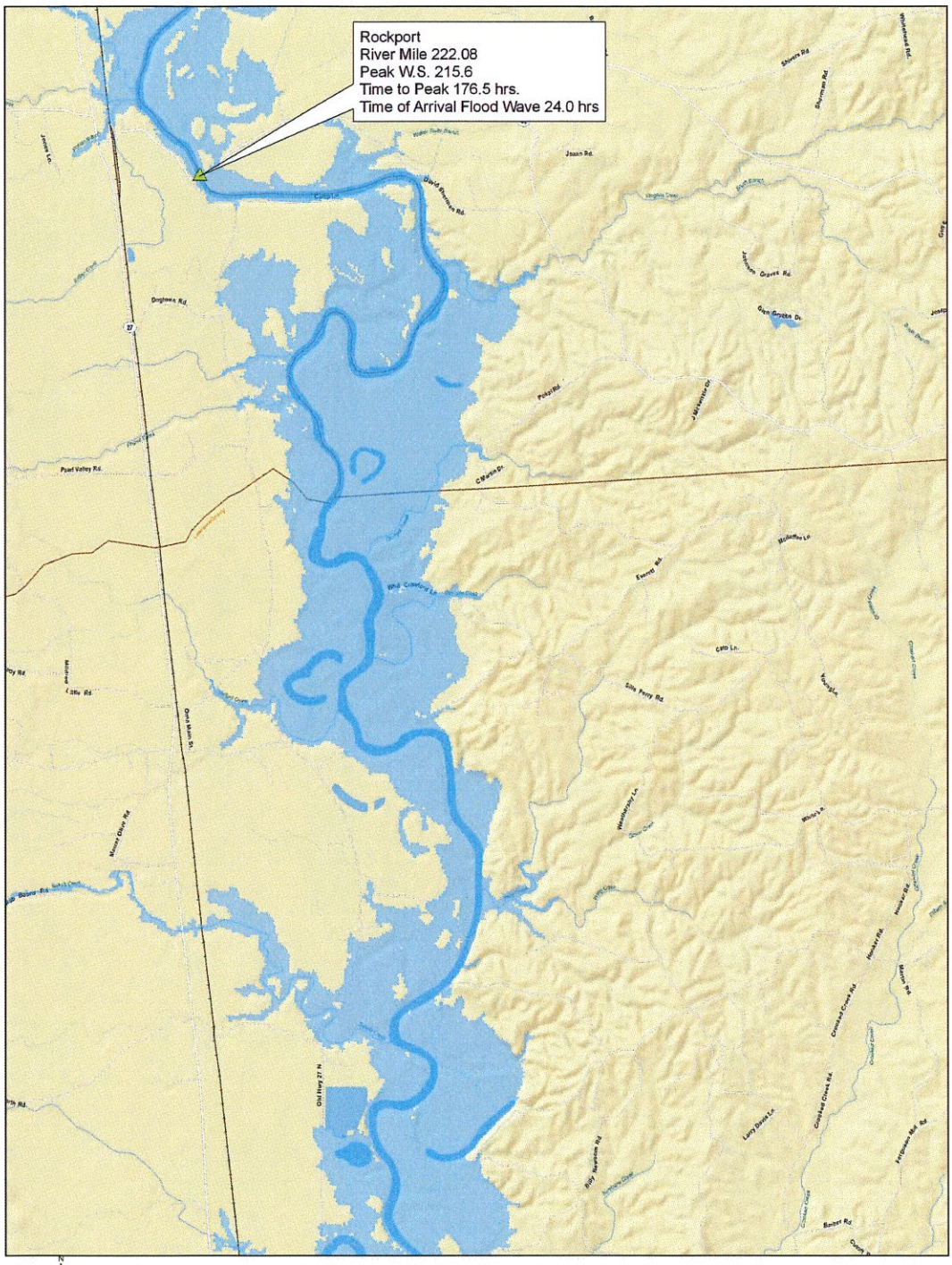
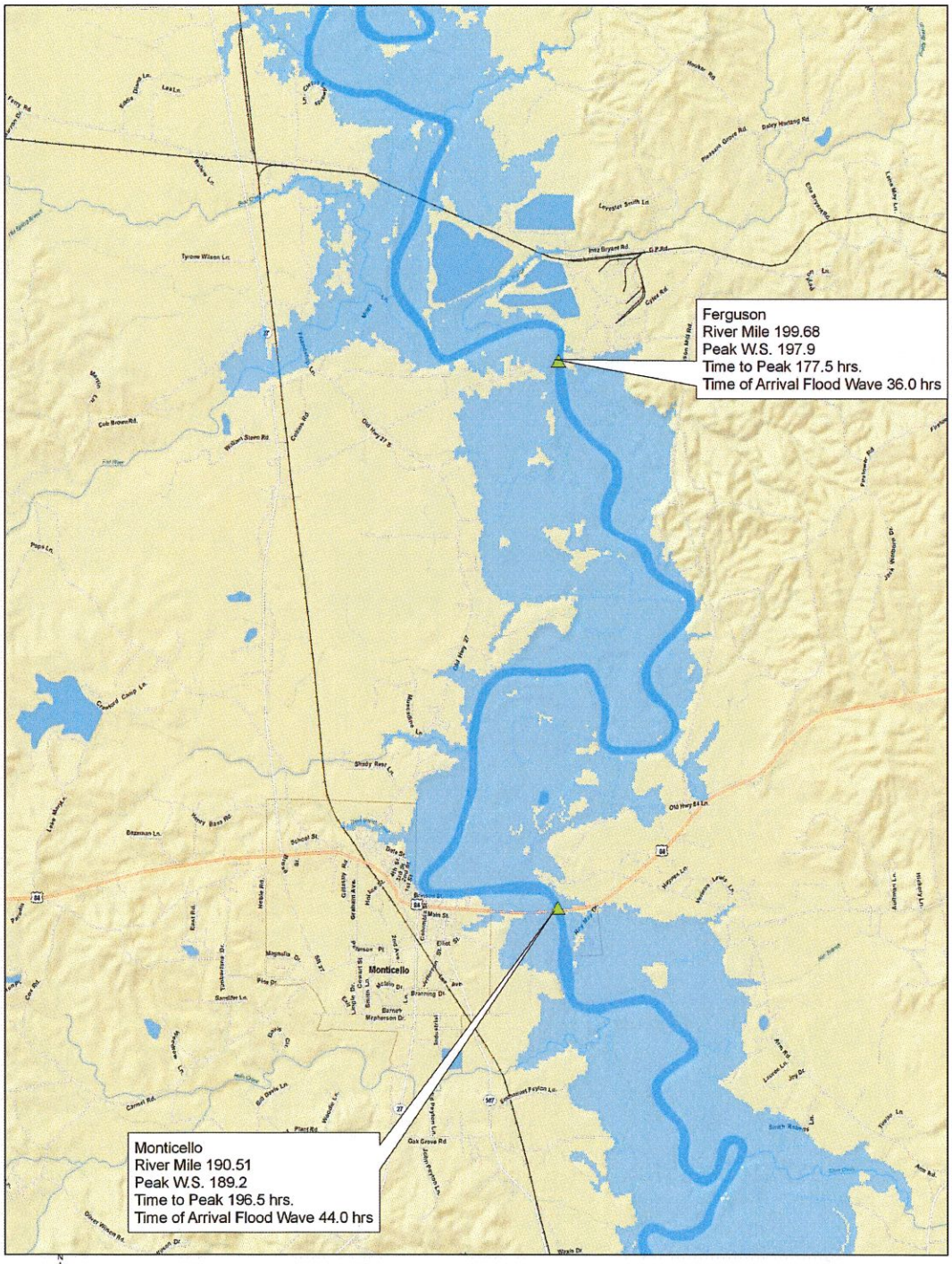


PLATE 9

1" = 4000 feet

Ross Barnett Dam & Reservoir
Failure Bank Full Stage



1" = 4000 feet

PLATE 10

Ross Barnett Dam & Reservoir
Failure Sunny Day East
Pool Elevation = 297 Feet

Plate 11a

Ross Barnett Dam & Reservoir
Failure Sunny Day East
Pool Elevation = 300 Feet

Plate 11b

Ross Barnett Dam & Reservoir
Failure Sunny Day West

Plate 12

LIST OF EAP HOLDERS

Date: July 24, 2018

1. EAP Coordinator
2. PRVWSD Board of Directors
3. Rankin County EMA
4. Madison County EMA
5. Hinds County EMA
6. Rankin/Hinds Pearl River Drainage Control District
7. City of Ridgeland
8. City of Flowood
9. Office of Homeland Security
10. Mississippi Emergency Management Agency
11. MDEQ, OLWR, Dam Safety Division
12. NWS/Lower MS River Forecast Center – Slidell, LA
13. NWS – Jackson, MS office
14. USACE – Vicksburg District
15. USGS
16. City of Columbia
17. City of Jackson
18. City of Monticello
19. City of Richland
20. Copiah County EMA
21. Hancock County EMA
22. Lawrence County EMA
23. Marion County EMA
24. Pearl River County EMA
25. Simpson County EMA
26. St. Tammany Parish Engineering Department
27. St. Tammany Parish Emergency Preparedness
28. Washington Parish Emergency Preparedness
29. Burns, Cooley, Dennis, Inc.

STATE OF MISSISSIPPI
PHIL BRYANT
GOVERNOR
MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
GARY C. RIKARD, EXECUTIVE DIRECTOR

November 18, 2016

Greg Burgess, P.E.
Chief Engineer, PRVWSD
P.O. Box 2180
Ridgeland, Mississippi 39157

Re: MS02716 - Ross Barnett Reservoir Dam Approval of Revised Emergency Action Plan (EAP)

Dear Mr. Burgess:

The revised EAP for the above referenced dam is hereby approved. Please make any necessary corrections to contact information, etc. and distribute the plan to the agreed upon List of EAP Holders.

If you have any questions, please e-mail me at DMyers@mdeq.ms.gov or call me at 601-961-5207.

Sincerely;

Dusty Myers, P.E.
Chief, Dam Safety Division