

# Emergency Action Plan (EAP)

## Rock Creek Watershed, Dam No. 23

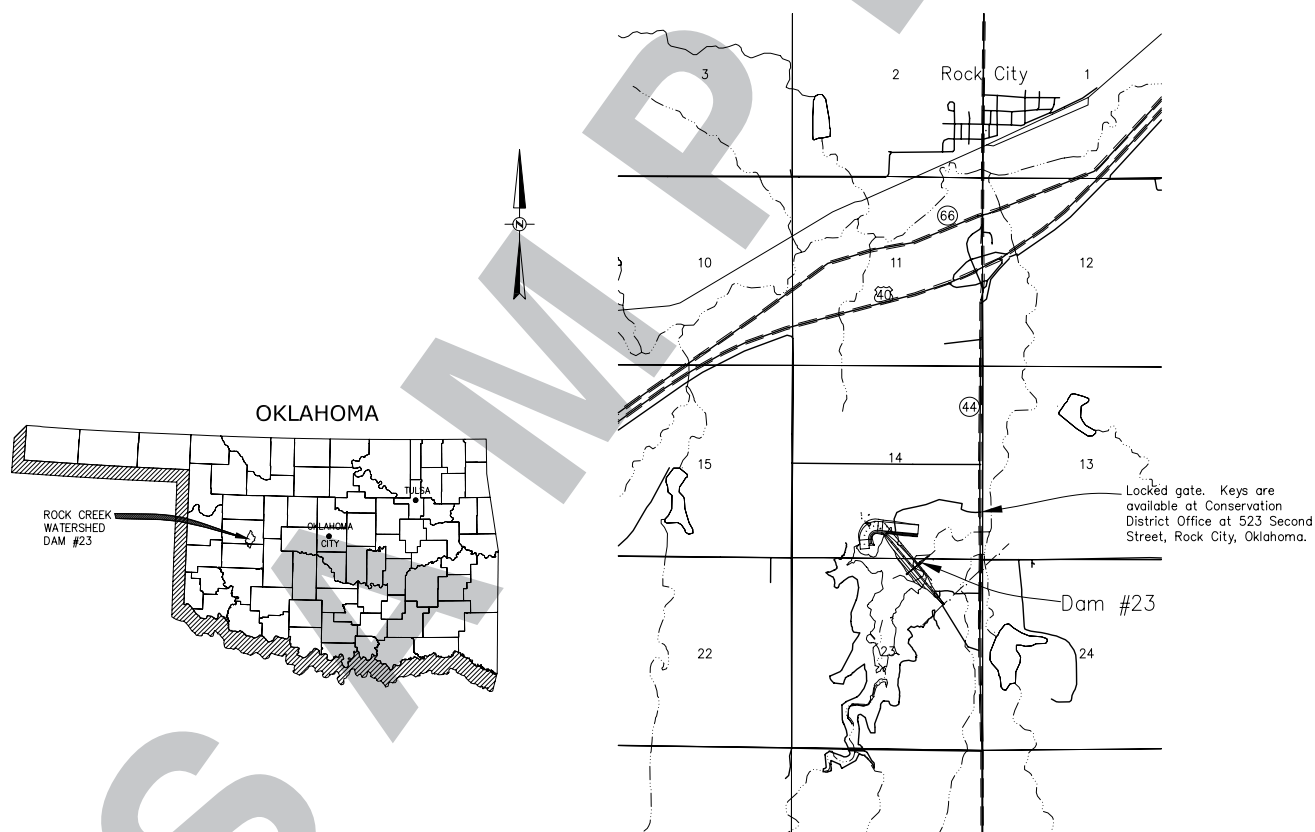
### (Rock City Lake)

## National Inventory of Dams (NID) No. OK11111

### Coal County, Oklahoma

### Coal County Conservation District

With assistance from the  
U.S. Department of Agriculture  
Natural Resources Conservation Service



Reviewed and Updated:

\_\_\_\_\_  
*Chair, Coal County Conservation District*

\_\_\_\_\_  
*Sheriff, Coal County, OK*

\_\_\_\_\_  
*Date*

\_\_\_\_\_  
*Date*

Copy 3 of 8

# Contents

Basic EAP Data .....	2
EAP Overview .....	3
Roles and Responsibilities .....	4
The Five-step EAP Process	
Step 1    Event Detection .....	5
Step 2    Emergency Level Determination .....	6
Guidance for Determining the Emergency Level .....	7
Examples of Emergency Situations .....	8
Step 3    Notification and Communication .....	10
Notification Charts .....	12
Other Emergency Services Contacts .....	15
Step 4    Expected Actions .....	16
Step 5    Termination .....	19
Maintenance—EAP Review and Revision .....	20
Record of Holders of Control Copies of this EAP .....	21
Record of Revisions and Updates Made to EAP .....	23
Concurrences   23	
Appendices—Forms, Glossary, Maps, and Supporting Data .....	24
Appendix A	
Appendix A–1    Contact Checklist .....	25
Appendix A–2    Unusual or Emergency Event Log Form .....	26
Appendix A–3    Dam Emergency Situation Report Form .....	27
Appendix A–4    Glossary of Terms .....	28
Appendix B	
Appendix B–1    Resources Available .....	31
Appendix B–2    Location and Vicinity Maps .....	32
Appendix B–3    Watershed Project Map .....	33
Appendix B–4    Evacuation Map .....	34
Appendix B–5    Residents/Businesses/Highways at Risk .....	35
Appendix B–6    Plan View of Dam .....	36
Appendix B–7    Profile of Principal Spillway .....	37
Appendix B–8    Reservoir Elevation-area-volume and Spillway Capacity Data .....	38
Appendix B–9    National Inventory of Dams (NID) Data .....	39

# Basic EAP Data

## Purpose

The purpose of this EAP is to reduce the risk of human life loss and injury and minimize property damage during an unusual or emergency event at Rock Creek Watershed, Dam No. 23.

## Potential Impacted Area

See *Evacuation Map* tab (Appendix B–4) and *People at Risk* tab (Appendix B–5) for the locations and contact information of the following residents and businesses that may be flooded if the dam should fail and the estimated time for the floodwave to travel from the dam to these locations:

- 6 houses:
  - 4 on the south side of the Elmwood Heights subdivision in southeast Rock City
  - 2 outside city limits:
    - 1 on south side of Rock Creek, south of Rock City
    - 1 on east side of Highway 44 approximately 1 mile south of Rock City
- 3 businesses on east side of Highway 44 south of Rock City:
  - Lori’s Music Shop, Larry’s Hardware, and Bill’s Coffee Shop
- 3 highways:
  - Interstate 40 and OK Highways 44 and 66

## Dam Description

Height: 40 ft

Built: 1960

Legal Description: Sects. 14 and 23, T13N, R21W

Latitude: 35.42875 Longitude: -99.19802

National Inventory of Dams No.: OK11111

Drainage Area: 7.7 mi

Hazard Classification: High

Dam Operator: Coal Co. Cons. District

Major Property Owner: Bryan Babcock

Dam Designer: NRCS

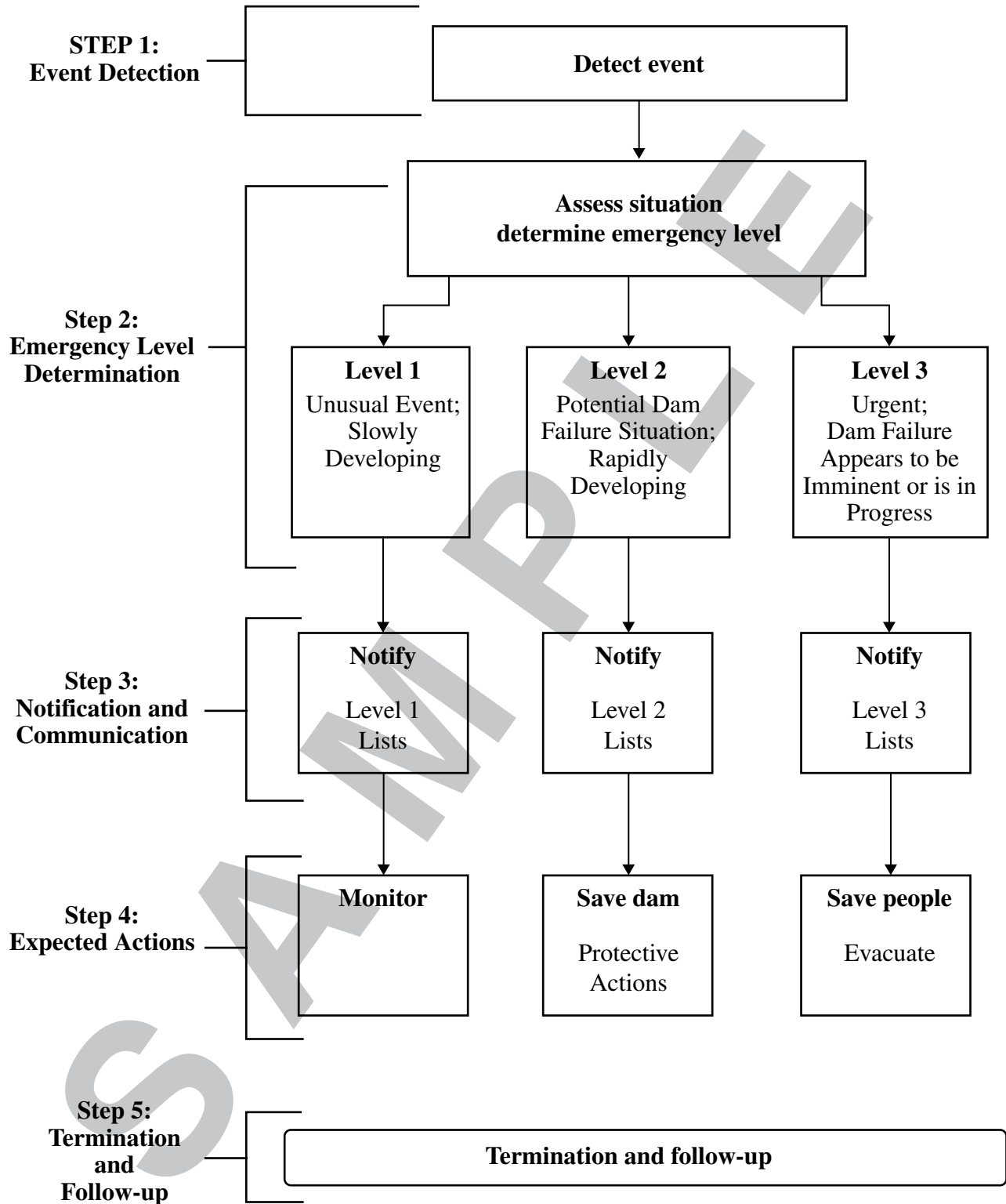
See detailed design data in *Appendix B* tab.

## Directions to dam (See *Location and Vicinity Map*—Appendix B–2.)

Rock Creek Watershed, Dam No. 23, can be accessed by traveling south 1.2 miles on OK Highway 44 from the Interstate 40 interchange south of Rock City; turn right (west) on a gated dirt road that goes directly to the left abutment of the dam. Keys for the lock on the gate are available from the Conservation District Manager at 523 Second Street, Rock City, OK. Note that a portion of this road is within the dam breach inundation area, and the valley below the dam may be flooded.

An alternate route to the dam is available approximately 0.5 miles south of Rock Creek on Highway 44; turn right on an ungated dirt road that goes to the right abutment of the dam. Note that Highway 44 may be inundated or the bridge may be damaged, so access to this alternate route may have to be gained from Highway 44 south of the dam.

## EAP Overview



# Roles and Responsibilities

## **Dam Operator's Representative (Conservation District Manager)**

- As soon as an emergency event is observed or reported, immediately determine the emergency level (see *Emergency Levels* tab).
  - Level 1: unusual event, slowly developing
  - Level 2: potential dam failure situation, rapidly developing
  - Level 3: dam failure appears imminent or is in progress
- Immediately notify the personnel in the order shown on the notification chart for the appropriate level (see *Notification Charts* tab).
- Provide updates of the situation to the police/sheriff dispatcher to assist them in making timely and accurate decisions regarding warnings and evacuations.
- Provide leadership to assure the EAP is reviewed and updated annually and copies of the revised EAP are distributed to all who received copies of the original EAP.

## **Incident Commander (County Sheriff)**

- Serve as the primary contact person responsible for coordination of all emergency actions.
- When a Level 2 situation occurs: Prepare emergency management personnel for possible evacuations that may be needed if a Level 3 situation occurs.
- When a Level 3 situation occurs:
  - Initiate warnings and order evacuation of people at risk downstream of the dam.
  - Notify local emergency management services to carry out the evacuation of people and close roads within the evacuation area (see *Evacuation Map* tab).
- Decide when to terminate the emergency.
- Participate in an annual review and update of the EAP.

## **Emergency Management Services (Rock City)**

- Maintain communication with media.
- When a Level 2 situation occurs:
  - Prepare emergency management personnel for possible evacuations that may be needed if a Level 3 situation occurs.
  - Alert the public.
- When a Level 3 situation occurs:
  - Alert the public.
  - Immediately close roads and evacuate people within the evacuation area (see *Evacuation Map* tab).
- Participate in an annual review and update of the EAP.

## **Dam Operator's Technical Representatives (NRCS)**

- Advise the dam operator of the emergency level determination, if time permits.
- Advise the dam operator of remedial actions to take if a Level 2 event occurs, if time permits.

## **State Dam Safety Agency (Oklahoma Water Resources Board)**

- Advise the dam operator of the emergency level determination, if time permits.
- Advise the dam operator of remedial actions to take if a Level 2 event occurs, if time permits.

# The Five-step EAP Process

## *Step 1 Event Detection*

This step describes the detection of an unusual or emergency event and provides information to assist the dam operator in determining the appropriate emergency level for the event.

Unusual or emergency events may be detected by:

- Observations at or near the dam by government personnel (local, state, or Federal), landowners, visitors to the dam, or the public
- Evaluation of instrumentation data
- Earthquakes felt or reported in the vicinity of the dam
- Forewarning of conditions that may cause an unusual event or emergency event at the dam (for example, a severe weather or flash flood forecast)

See *Guidance for Determining the Emergency Level* table for assistance in evaluating specific events to determine if they are unusual or potential emergency situations.

## **Step 2      *Emergency Level Determination***

After an unusual or emergency event is detected or reported, the Conservation District Manager or his alternate is responsible for classifying the event into one of the following three emergency levels:

### **Emergency Level 1—Nonemergency, unusual event, slowly developing:**

This situation is not normal but has not yet threatened the operation or structural integrity of the dam but possibly could if it continues to develop. NRCS technical representatives or state dam safety officials should be contacted to investigate the situation and recommend actions to be taken. The condition of the dam should be closely monitored, especially during storm events, to detect any development of a potential or imminent dam failure situation. The Sheriff should be informed if it is determined that the conditions may possibly develop into a worse condition that may require emergency actions.

### **Emergency Level 2—Potential dam failure situation, rapidly developing:**

This situation may eventually lead to dam failure and flash flooding downstream, but there is not an immediate threat of dam failure. The sheriff should be notified of this emergency situation and placed on alert. The dam operator should closely monitor the condition of the dam and periodically report the status of the situation to the Sheriff. If the dam condition worsens and failure becomes imminent, the sheriff must be notified immediately of the change in the emergency level to evacuate the people at risk downstream.

If time permits, NRCS and state dam safety officials should be contacted to evaluate the situation and recommend remedial actions to prevent failure of the dam. The dam operator should initiate remedial repairs (local resources that may be available—see Appendix B-1). Time available to employ remedial actions may be hours or days.

This emergency level is also applicable when flow through the earth spillway has or is expected to result in flooding of downstream areas and people near the channel could be endangered. Emergency services should be on alert to initiate evacuations or road closures if the flooding increases.

### **Emergency Level 3—Urgent; dam failure appears imminent or is in progress:**

This is an extremely urgent situation when a dam failure is occurring or obviously is about to occur and cannot be prevented. Flash flooding will occur downstream of the dam. This situation is also applicable when flow through the earth spillway is causing downstream flooding of people and roads. The Sheriff should be contacted immediately so emergency services can begin evacuations of all at-risk people and close roads as needed (see *Evacuation Map* tab).

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

# Guidance for Determining the Emergency Level

Event	Situation	Emergency level*
Earth spillway flow	Reservoir water surface elevation at auxiliary spillway crest or spillway is flowing with no active erosion	1
	Spillway flowing with active gully erosion	2
	Spillway flow that could result in flooding of people downstream if the reservoir level continues to rise	2
	Spillway flowing with an advancing headcut that is threatening the control section	3
	Spillway flow that is flooding people downstream	3
Embankment overtopping	Reservoir level is 1 foot below the top of the dam	2
	Water from the reservoir is flowing over the top of the dam	3
Seepage	New seepage areas in or near the dam	1
	New seepage areas with cloudy discharge or increasing flow rate	2
	Seepage with discharge greater than 10 gallons per minute	3
Sinkholes	Observation of new sinkhole in reservoir area or on embankment	2
	Rapidly enlarging sinkhole	3
Embankment cracking	New cracks in the embankment greater than 1/4-inch wide without seepage	1
	Cracks in the embankment with seepage	2
Embankment movement	Visual movement/slippage of the embankment slope	1
	Sudden or rapidly proceeding slides of the embankment slopes	3
Instruments	Instrumentation readings beyond predetermined values	1
Earthquake	Measurable earthquake felt or reported on or within 50 miles of the dam	1
	Earthquake resulting in visible damage to the dam or appurtenances	2
	Earthquake resulting in uncontrolled release of water from the dam	3
Security threat	Verified bomb threat that, if carried out, could result in damage to the dam	2
	Detonated bomb that has resulted in damage to the dam or appurtenances	3
Sabotage/ vandalism	Damage to dam or appurtenances with no impacts to the functioning of the dam	1
	Modification to the dam or appurtenances that could adversely impact the functioning of the dam	1
	Damage to dam or appurtenances that has resulted in seepage flow	2
	Damage to dam or appurtenances that has resulted in uncontrolled water release	3

\* Emergency Level 1: Nonemergency, unusual event, slowly developing

\* Emergency Level 2: Potential dam failure situation, rapidly developing

\* Emergency Level 3: Urgent; dam failure appears imminent or is in progress



## Examples of Emergency Situations

The following are examples of conditions that usually constitute an emergency situation that may occur at a dam. Adverse or unusual conditions that can cause the failure of a dam are typically related to aging or design and construction oversights. Extreme weather events that exceed the original designed conditions can cause significant flow through the auxiliary spillway or overtopping of the embankment. However, accidental or intentional damage to the dam may also result in emergency conditions. The conditions have been grouped to identify the most likely emergency-level condition. The groupings are provided as guidance only. Not all emergency conditions may be listed, and the dam operator is urged to use conservative judgment in determining whether a specific condition should be defined as an emergency situation at the dam.

**Pre-existing conditions on this dam:** There has been a small seepage area near the downstream toe on the north side of the release channel. This was first noticed in the 1990s, but has not changed since that time.

### Earth Spillway Flows

#### **Emergency Level 2—Potential dam failure situation; rapidly developing:**

1. Significant erosion or headcutting of the spillway is occurring, but the rate does not appear to threaten an imminent breach of the spillway crest that would result in an uncontrolled release of the reservoir.
2. Flow through the earth auxiliary spillway is or is expected to cause flooding that could threaten people, homes, and/or roads downstream from the dam.

#### **Emergency Level 3—Urgent; dam failure appears imminent or is in progress:**

1. Significant erosion or headcutting of the spillway is occurring at a rapid rate, and a breach of the control section appears imminent.
2. Flow through the earth auxiliary spillway is causing flooding that is threatening people, homes, and/or roads downstream from the dam.

### Embankment Overtopping

#### **Emergency Level 2—Potential dam failure situation; rapidly developing:**

1. The reservoir level is within 1 foot from the top of the dam.

#### **Emergency Level 3—Urgent; dam failure appears imminent or is in progress:**

1. The reservoir level has exceeded the top of the dam, and flow is occurring over the embankment.

## Seepage and Sinkholes

### Emergency Level 2—Potential dam failure situation; rapidly developing:

1. Cloudy seepage or soil deposits are observed at seepage exit points or from internal drain outlet pipes.
2. New or increased areas of wet or muddy soils are present on the downstream slope, abutment, and/or foundation of the dam, and there is an easily detectable and unusual increase in volume of downstream seepage.
3. Significant new or enlarging sinkhole(s) near the dam or settlement of the dam is observed.
4. Reservoir level is falling without apparent cause.
5. The following known dam defects are or will soon be inundated by a rise in the reservoir:
  - Sinkhole(s) located on the upstream slope, crest, abutment, and/or foundation of the dam; or
  - Transverse cracks extending through the dam, abutments, or foundation.

### Emergency Level 3—Urgent; dam failure appears imminent or is in progress:

1. Rapidly increasing cloudy seepage or soil deposits at seepage exit points to the extent that failure appears imminent or is in progress.
2. Rapid increase in volume of downstream seepage to the extent that failure appears imminent or is in progress.
3. Water flowing out of holes in the downstream slope, abutment, and/or foundation of the dam to the extent that failure appears imminent or is in progress.
4. Whirlpools or other evidence exists indicating that the reservoir is draining rapidly through the dam or foundation.
5. Rapidly enlarging sinkhole(s) are forming on the dam or abutments to the extent that failure appears imminent or is in progress.
6. Rapidly increasing flow through crack(s) eroding materials to the extent that failure appears imminent or is in progress.

## Embankment Movement and Cracking

### Emergency Level 2—Potential dam failure situation; rapidly developing:

1. Settlement of the crest, slopes, abutments and/or foundation of the dam that may eventually result in breaching of the dam.
2. Significant increase in length, width, or offset of cracks in the crest, slopes, abutments, and/or foundation of the dam that may eventually result in breaching of the dam.

### Emergency Level 3—Urgent; dam failure appears imminent or is in progress:

1. Sudden or rapidly proceeding slides, settlement, or cracking of the embankment crest, slopes, abutments, and/or foundation, and breaching of the dam appears imminent or is in progress.

### Step 3 Notification and Communication

#### Notification:

After the emergency level has been determined, the people on the following notification charts for the appropriate emergency level shall be notified immediately.

#### Communication:

##### Emergency Level 1—Nonemergency, unusual event; slowly developing:

The Conservation District Manager and NRCS District Conservationist should contact the NRCS State Conservation Engineer and Oklahoma Water Resources Board. Describe the situation, and request technical assistance on next steps to take.

##### Emergency Level 2—Potential dam failure situation; rapidly developing:

The following message may be used to help describe the emergency situation to the Sheriff or Rock City emergency management personnel:

*“This is \_\_\_\_\_ (Identify yourself: name, position) \_\_\_\_\_.*

*We have an emergency condition at Rock Creek Watershed, Dam No. 23, located 2 miles south of Rock City.*

*We have activated the Emergency Action Plan for this dam and are currently under Emergency Level 2.*

*We are implementing predetermined actions to respond to a rapidly developing situation that could result in dam failure.*

*Please prepare to evacuate the area along low-lying portions of Rock Creek.*

*Reference the evacuation map in your copy of the Emergency Action Plan.*

*We will advise you when the situation is resolved or if the situation gets worse.*

*I can be contacted at the following number \_\_\_\_\_. If you cannot reach me, please call the following alternative number \_\_\_\_\_.”*

**Emergency Level 3—Urgent; dam failure appears imminent or is in progress:**

The Sheriff should be contacted immediately and the area evacuated (see *Evacuation Map* tab). The following actions should be taken:

1. Call the Sheriff's dispatch center. Be sure to say, "This is an emergency." They will call other authorities and the media and begin the evacuation. The following message may be used to help describe the emergency situation to the Sheriff or Rock City emergency management personnel:

*"This is an emergency. This is \_\_\_\_\_ Identify yourself; name, position) \_\_\_\_\_."*

*Rock Creek Watershed, Dam No. 23, located 2 miles south of Rock City, is failing. The downstream area must be evacuated immediately. Repeat, Rock Creek Watershed, Dam No. 23, is failing; evacuate the area along low-lying portions of Rock Creek.*

*We have activated the Emergency Action Plan for this dam and are currently under Emergency Level 3. Reference the evacuation map in your copy of the Emergency Action Plan.*

*I can be contacted at the following number \_\_\_\_\_. If you cannot reach me, please call the following alternative number \_\_\_\_\_."*

2. Do whatever is necessary to bring people in immediate danger (anyone on the dam, downstream from the dam, boating on the reservoir, or evacuees) to safety if directed by the Sheriff.
3. Keep in frequent contact with the Sheriff and emergency services to keep them up-to-date on the condition of the dam. They will tell you how you can help handle the emergency.
4. If all means of communication are lost: (1) try to find out why, (2) try to get to another radio or telephone that works, or (3) get someone else to try to re-establish communications. If these means fail, handle the immediate problems as well as you can, and periodically try to re-establish contact with the Sheriff and emergency services.

The following prescribed message may be used as a guide for the Sheriff or Rock City emergency services personnel to communicate the status of the emergency with the public:

*Attention: This is an emergency message from the Sheriff. Listen carefully. Your life may depend on immediate action.*

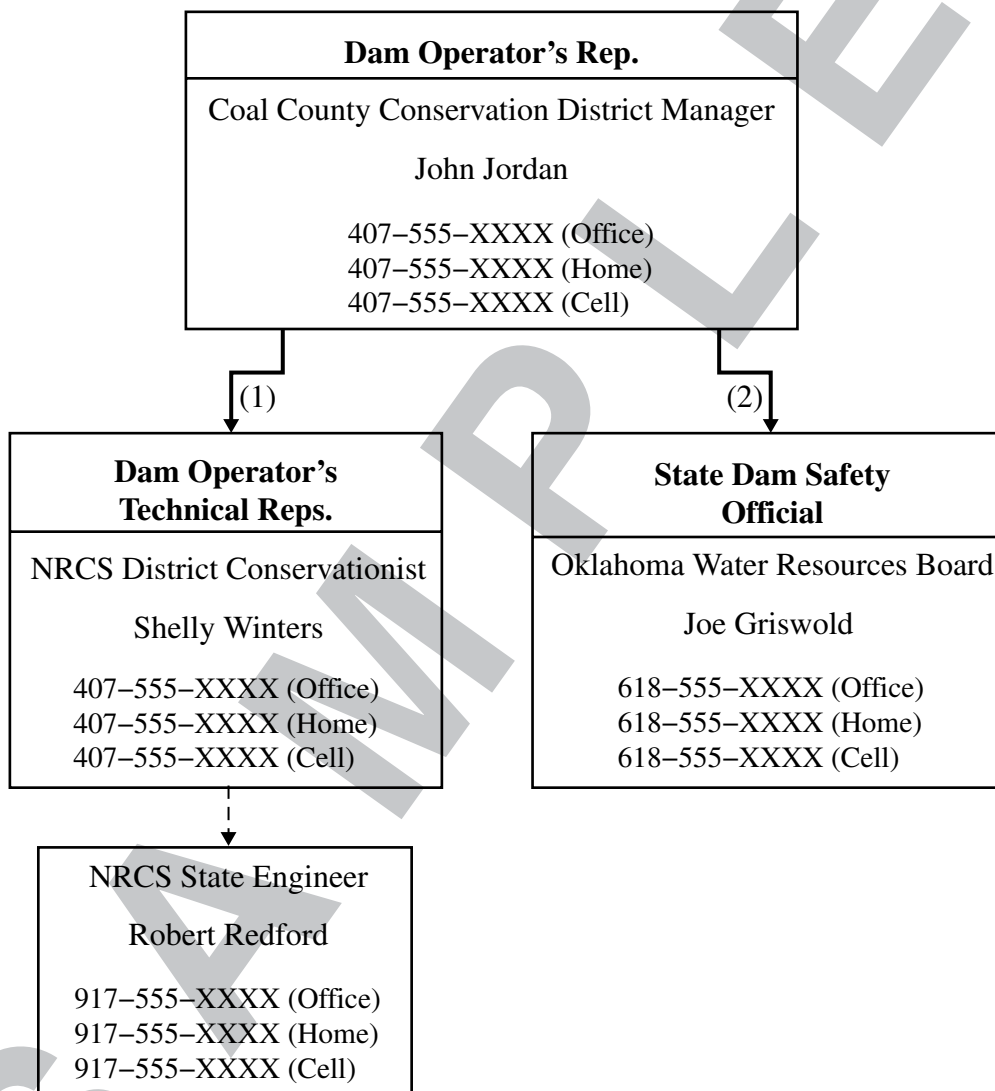
*Rock Creek Watershed, Dam No. 23, located 2 miles south of Rock City is failing. Repeat. Rock Creek Watershed, Dam No. 23, located 2 miles south of Rock City is failing.*

*If you are in or near this area, proceed immediately to high ground away from the valley. Do not travel on Highway 44 south of Rock City or return to your home to recover your possessions. You cannot outrun or drive away from the floodwave. Proceed immediately to high ground away from the valley.*

Repeat message.

# Emergency Level 1 Notifications

**Nonemergency  
unusual event, slowly developing**



**Note:**

1,2, etc., denotes call sequence

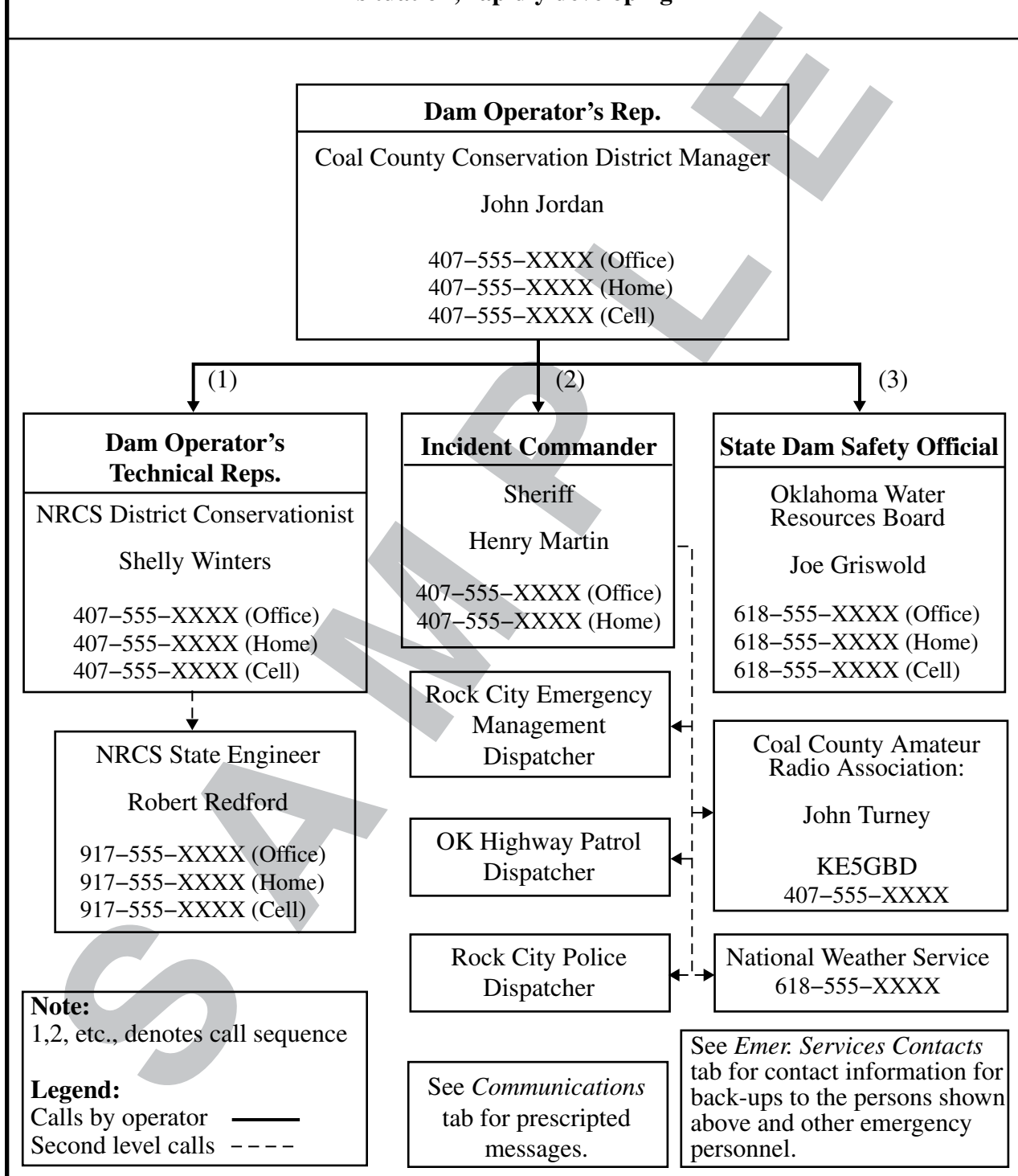
**Legend:**

Calls by operator ———  
Second level calls - - - -

See *Emer. Services Contacts* tab for contact information for back-ups to the persons shown above and other emergency personnel.

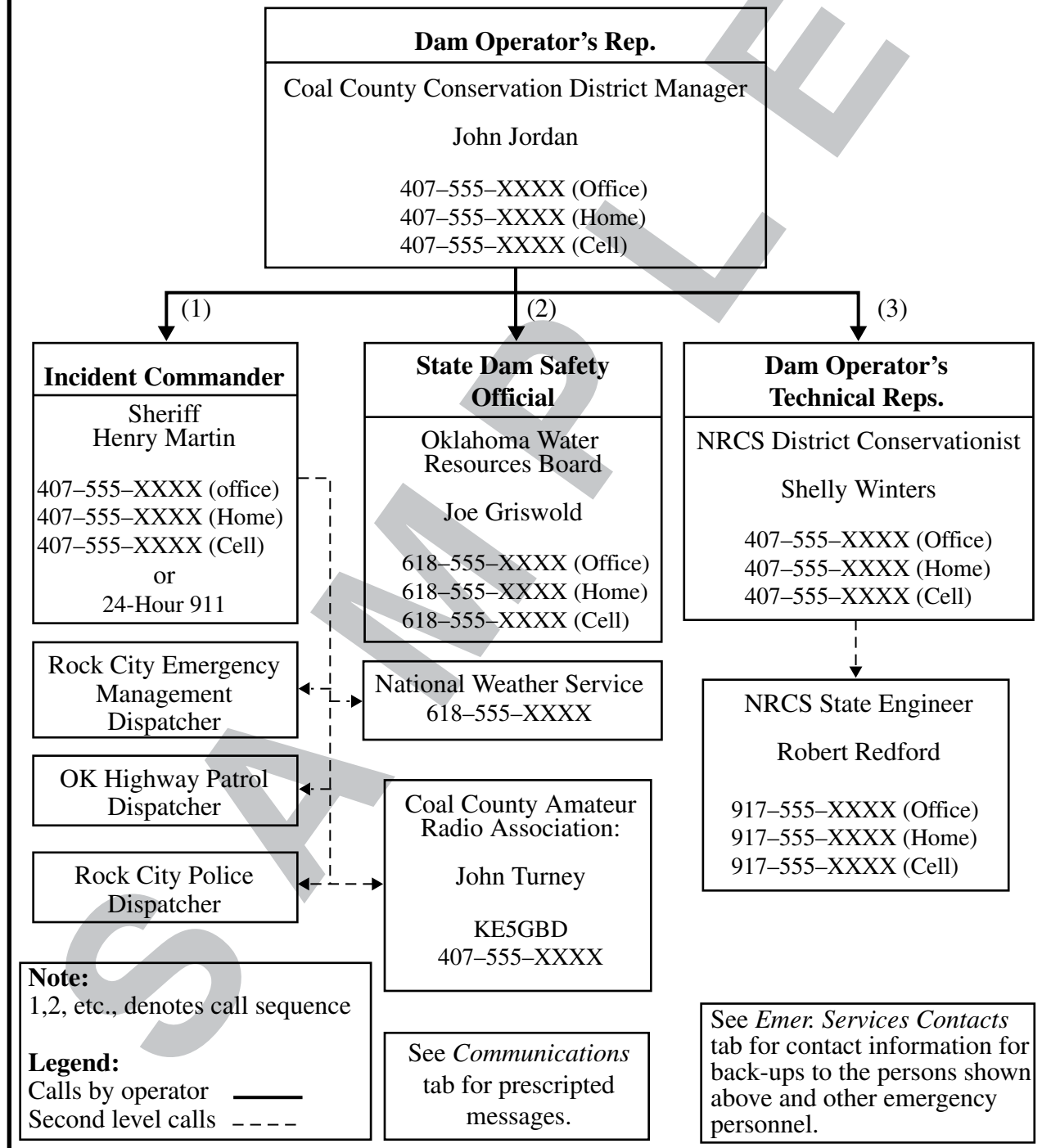
## Emergency Level 2 Notifications

**Emergency event, potential dam failure situation; rapidly developing**



## Emergency Level 3 Notifications

**Urgent event, dam failure appears imminent or is in progress**





## Emergency Services Contacts

Agency/organization	Principal contact	Address	Office telephone number	Alternate telephone numbers
Coal County Board of Supervisors	Gloria Brown Chair	336 Highway 66 Rock City, OK	407-555-XXXX	407-555-XXXX
Coal County Road Department	Max Gray Supervisor	973 Ninth Street Rock City, OK	407-555-XXXX	407-555-XXXX
Coal County Conservation District	John Jordon * District Manager	523 Second Street Rock City, OK	407-555-XXXX	407-555-XXXX (H) 405-555-XXXX (C)
Coal County Conservation District	Mary James * District Secretary	523 Second Street Rock City, OK	407-555-XXXX	407-555-XXXX (H) 405-555-XXXX (C)
Coal County Conservation District	Mike Blain * Board Chair	523 Second Street Rock City, OK	407-555-XXXX	407-555-XXXX (H) 405-555-XXXX (C)
Coal County Sheriff	Henry Martin	336 Highway 66 Rock City, OK	407-555-XXXX	407-555-XXXX (H) 407-555-XXXX (C)
Dry Gulch Television Station KJMT	Chris Klinger Manager	5632 Main Street Dry Gulch, OK	407-555-XXXX	407-555-XXXX
Landowner of Dam No. 23	Bryon Babcock	R.R. #2 Rock City, OK		407-555-XXXX (H) 407-555-XXXX (C)
National Weather Service	Danny Lee Climatologist	66374 Elm Street Norman, OK	618-555-XXXX	407-555-XXXX
Natural Resources Conservation Service	Shelly Winters District Conservationist	523 Second Street Rock City, OK	407-555-XXXX	407-555-XXXX (H) 405-555-XXXX (C)
Natural Resources Conservation Service	John Blake * Technician	523 Second Street Rock City, OK	407-555-XXXX	407-555-XXXX (H)
Natural Resources Conservation Service	Robert Redford State Engineer	3458 Farm Road Strong City, OK	917-555-XXXX	917-555-XXXX (H) 917-555-XXXX (C)
Oklahoma Department of Transportation	Bill Dobson District Engineer	539 Center Street Dry Gulch, OK	407-555-XXXX	
Oklahoma Highway Patrol	Richard Barnell	299 First Avenue Dry Gulch, OK	407-555-XXXX	
Oklahoma Water Resources Board	Joe Griswold Dam Safety Officer	1522 Maple Avenue Strong City, OK	618-555-XXXX	618-555-XXXX (H) 618-555-XXXX (C)
Rock City Emergency Management Coordinator	Jeff Powers	121 Main Street Rock City, OK	407-555-XXXX	
Rock City Fire Department	Harry James	336 Maple Street Rock City, OK	407-555-XXXX	
Rock City Police	Red Jones	336 Maple Street Rock City, OK	407-555-XXXX	
Rock City Radio Station 1040 AM	Scott Fagen Manager	667 Eighth Street Rock City, OK	407-555-XXXX	

\* Back-up to primary contact



## Step 4 Expected Actions

If the police or sheriff receives a 911 call regarding observations of an unusual or emergency event at the dam, they should immediately contact the Conservation District office. After the Conservation District Manager determines the emergency level, the following actions should be taken. If time permits, NRCS and the Oklahoma Water Resources Board should be contacted for technical consultation.

### Emergency Level 1—Nonemergency, unusual event; slowly developing:

- A. The Conservation District Manager should inspect the dam. At a minimum, inspect the full length of the upstream slope, crest, downstream toe, and downstream slope. Also check the reservoir area, abutments, and downstream channel for signs of changing conditions. **If increased seepage, erosion, cracking, or settlement are observed, immediately report the observed conditions to the NRCS or the Oklahoma Water Resources Board; refer to the emergency level table for guidance in determining the appropriate event level for the new condition and recommended actions.**
- B. Record all contacts that were made on the *Contact Checklist* (Appendix A–1) Record all information, observations, and actions taken on the *Event Log Form* (Appendix A–2). Note the time of changing conditions. Document the situation with photographs and video, if possible.
- C. The Conservation District Manager should contact NRCS and request technical staff to investigate the situation and recommend corrective actions.

### Emergency Level 2—Potential dam failure situation; rapidly developing:

- A. The Conservation District Manager should contact the NRCS and the Oklahoma Water Resources Board to report the situation and, if time permits, request technical staff to investigate the situation and recommend corrective actions.
- B. The Conservation District Manager should contact the Sheriff to inform him/her that the EAP has been activated and if current conditions get worse, an emergency situation may require evacuation. Preparations should be made for possible road closures and evacuations.
- C. Provide updates to the Sheriff and emergency services personnel to assist them in making timely decisions concerning the need for warnings, road closures, and evacuations.
- D. If time permits, the Conservation District Manager should inspect the dam. At a minimum, inspect the full length of the upstream slope, crest, downstream toe, and downstream slope. Also check the reservoir area, abutments, and downstream channel for signs of changing conditions. **If piping, increased seepage, erosion, cracking, or settlement are observed, immediately report the observed conditions to the NRCS and the Oklahoma Water Resources Board; refer to the emergency level table for guidance in determining the appropriate event level for the new condition and recommended actions.**
- E. Record all contacts that were made on the *Contact Checklist* (Appendix A–1). Record all information, observations, and actions taken on the *Event Log Form* (Appendix A–2). Note the time of changing conditions. Document the situation with photographs and video, if possible.
- F. If time permits, the following emergency remedial actions should be taken as appropriate.

**Emergency Level 2—Potential dam failure situation; rapidly developing—continued:*****Emergency remedial actions***

If time permits, the following emergency remedial actions should be considered for Emergency Level 2 conditions. Immediate implementation of these remedial actions may delay, moderate, or prevent the failure of the dam. Several of the listed adverse or unusual conditions may be apparent at the dam at the same time, requiring implementation of several modes of remedial actions. Close monitoring of the dam must be maintained to confirm the success of any remedial action taken at the dam. Time permitting, any remedial action should be developed through consultation with NRCS and the Oklahoma Water Resources Board. See *Resources Available* (Appendix B–1) for sources of equipment and materials to assist with remedial actions.

***Embankment overtopping***

1. If the water level in the reservoir is no longer rising, place sandbags along the low areas of the top of the dam to control wave action, reduce the likelihood of flow concentration during minor overtopping, and to safely direct more water through the spillway.
2. Cover the weak areas of the top of the dam and downstream slope with riprap, sandbags, plastic sheets, or other materials to provide erosion-resistant protection.

***Seepage and sinkholes***

1. Open the principal spillway gate to lower the reservoir level as rapidly as possible to a level that stops or decreases the seepage to a nonerosive velocity. If the gate is damaged or blocked, pumping or siphoning may be required.

Continue lowering the water level until the seepage stops.

2. If the entrance to the seepage origination point is observed in the reservoir (possible whirlpool) and is accessible, attempt to reduce the flow by plugging the entrance with readily available materials such as hay bales, bentonite, soil or rockfill, or plastic sheeting.
3. Cover the seepage exit area(s) with several feet of sand/gravel to hold fine-grained embankment or foundation materials in place. Alternatively, construct sandbag or other types of ring dikes around seepage exit areas to retain a pool of water, providing backpressure and reducing the erosive nature of the seepage.
4. Prevent vehicles and equipment from driving between the seepage exit points and the embankment to avoid potential loss from the collapse of an underground void.

***Embankment movement***

1. Open outlet(s) and lower the reservoir to a safe level at a rate commensurate with the urgency and severity of the condition of the slide or slump. If the gate is damaged or blocked, pumping or siphoning may be required.
2. Repair settlement of the crest by placing sandbags or earth and rockfill materials in the damaged area to restore freeboard.
3. Stabilize slides by placing a soil or rockfill buttress against the toe of the slide.

***Earthquake***

1. Immediately conduct a general overall visual inspection of the dam.
2. Perform a field survey to determine if there has been any settlement and movement of the dam embankment, spillway, and low-level outlet works.
3. Drain the reservoir if required.

**Emergency Level 3—Urgent; dam failure appears imminent or is in progress:**

- A. The Conservation District Manager shall immediately contact the Sheriff and others shown on the notification chart.
- B. The Sheriff shall lead the efforts to carry out warnings, close roads, and evacuate people at risk downstream from the dam (see *Evacuation Map* tab).
- C. Emergency management services personnel shall alert the public and immediately evacuate at-risk people and close roads, as necessary.
- D. The Conservation District Manager shall maintain continuous communication and provide the Sheriff with updates of the situation to assist him/her in making timely decisions concerning warnings and evacuations.
- E. The Conservation District Manager should record all contacts that were made on the *Contact Checklist* (Appendix A–1). Record all information, observations, and actions taken on the *Event Log Form* (Appendix A–2). Note the time of changing conditions. Document the situation with photographs and video, if possible.
- F. Advise people monitoring the dam to follow safe procedures. Everyone should stay away from any of the failing structures or slopes and out of the potential breach inundation areas.

## ***Step 5 Termination***

Whenever the EAP has been activated, an emergency level has been declared, all EAP actions have been completed, and the emergency is over, the EAP operations must eventually be terminated and follow-up procedures completed.

### ***Termination responsibilities***

The Sheriff is responsible for terminating EAP operations and relaying this decision to the Conservation District Manager. It is then the responsibility of each person to notify the same group of contacts that were notified during the original event notification process to inform those people that the event has been terminated.

Prior to termination of an Emergency Level 3 event that has not caused actual dam failure, the NRCS technical representative or the State Dam Safety Officer will inspect the dam or require the inspection of the dam to determine whether any damage has occurred that could potentially result in loss of life, injury, or property damage. If it is determined that conditions do not pose a threat to people or property, the Sheriff will be advised to terminate EAP operations as described above.

The Conservation District Manager shall assure that the *Dam Safety Emergency Situation Report* (Appendix A-3) is completed to document the emergency event and all actions that were taken. The Conservation District shall distribute copies of the completed report to the Oklahoma Water Resources Board and the NRCS State Conservation Engineer.

# Maintenance—EAP Review and Revision

## EAP annual review

The Conservation District Manager will review and, if needed, update the EAP at least once each year. The EAP annual review will include the following:

- Calling all contacts on the three notification charts in the EAP to verify that the phone numbers and persons in the specified positions are current. The EAP will be revised if any of the contacts have changed.
- Contacting the local law enforcement agency to verify the phone numbers and persons in the specified positions. In addition, the Conservation District Manager will ask if the person contacted knows where the EAP is kept and if responsibilities described in the EAP are understood.
- Calling the locally available resources to verify that the phone numbers, addresses, and services are current.

## Revisions

The Conservation District is responsible for updating the EAP document. The EAP document held by the Conservation District is the master document. When revisions occur, the Conservation District will provide the revised pages and a revised revision summary page to all the EAP document holders. The document holders are responsible for revising outdated copy of the respective document(s) whenever revisions are received. Outdated pages shall be immediately discarded to avoid any confusion with the revisions.

## EAP periodic test

The Conservation District will host and facilitate a periodic test of the EAP at least once every 5 years.

The periodic test will consist of a meeting, including a tabletop exercise, conducted at the Coal County Conservation District office. Attendance should include the Conservation District Manager, key conservation district staff members, NRCS staff, at least one representative of the local law enforcement agency, and others with key responsibilities listed in the EAP. At the discretion of the Conservation District, other organizations that may be involved with an unusual or emergency event at the dam are encouraged to participate. Before the tabletop exercise begins, meeting participants will visit the dam during the periodic test to familiarize themselves with the dam site.

The tabletop exercise will begin with the facilitator presenting a scenario of an unusual or emergency event at the dam. The scenario will be developed prior to the exercise. Once the scenario has been presented, the participants will discuss the responses and actions that they would take to address and resolve the scenario. The narrator will control the discussion, ensuring realistic responses and developing the scenario throughout the exercise. The Conservation District Manager should complete an event log as they would during an actual event.

After the tabletop exercise, the five sections of the EAP will be reviewed and discussed. Mutual aid agreements and other emergency procedures can be discussed. The Conservation District will prepare a written summary of the periodic test and revise the EAP, as necessary.

## Record of Holders of Control Copies of this EAP

Copy number	Organization	Person receiving copy
1	Coal County Conservation District 523 Second Street Rock City, OK 50010	John Jordan
2	Coal County Conservation District 523 Second Street Rock City, OK 50010	Mike Blain
3	NRCS Field Office 523 Second Street Rock City, OK 50010	Shelly Winters
4	NRCS State Office 3458 Farm Road Strong City, OK 51020	Robert Redford
5	Coal County Sheriff's Department 336 Highway 66 Rock City, OK 50010	Henry Martin
6	Rock City Emergency Management 121 Main Street Rock City, OK 50010	Jeff Powers
7	Rock City Police Department 336 Maple Street Rock City, OK 50010	Red Jones
8	Oklahoma Water Resources Board 1522 Maple Street Strong City, OK 51020	Joe Griswold

## Record of Revisions and Updates Made to EAP

Revision number	Date	Revisions made	By whom
1	6-25-07	Updated 6-25-07 EAP with current contact information for Conservation District personnel and names of new residents in evacuation area	John Jordon

# Concurrences

By my signature, I acknowledge that I, or my representative, have reviewed this plan and concur with the tasks and responsibilities assigned herein for me and my organization.

1. \_\_\_\_\_  
*Signature* *Organization* *Date*

Printed name and title: Mike Blain, Chair, Coal County Conservation District

2. \_\_\_\_\_  
*Signature* *Organization* *Date*

Printed name and title: Henry Martin, Sheriff, Coal County

3. \_\_\_\_\_  
*Signature* *Organization* *Date*

Printed name and title: Jeff Powers, Emergency Management Coordinator, Rock City

4. \_\_\_\_\_  
*Signature* *Organization* *Date*

Printed name and title: Red Jones, Chief of Police, Rock City

5. \_\_\_\_\_  
*Signature* *Organization* *Date*

Printed name and title: Shelley Winters, District Conservationist, NRCS, Rock City

6. \_\_\_\_\_  
*Signature* *Organization* *Date*

Printed name and title: \_\_\_\_\_

7. \_\_\_\_\_  
*Signature* *Organization* *Date*

Printed name and title: \_\_\_\_\_



# Appendices—Forms, Glossary, Maps, and Supporting Data

## Appendix A

- A-1 Contact Checklist
- A-2 Unusual or Emergency Event Log Form
- A-3 Dam Emergency Situation Report Form
- A-4 Glossary of Terms

## Appendix B

- B-1 Resources Available
- B-2 Location and Vicinity Maps
- B-3 Watershed Project Map
- B-4 Evacuation Map
- B-5 Residents/Businesses/Highways at Risk
- B-6 Plan View of Dam
- B-7 Profile of Principal Spillway
- B-8 Reservoir Elevation-Area-Volume and Spillway Capacity Data
- B-9 National Inventory of Dams (NID) Data

# Appendix A–1

## Contact Checklist

Rock Creek Watershed, Dam No. 23

Coal County, Oklahoma

Date \_\_\_\_\_

The following contacts should be made immediately after the emergency level is determined (see pages 7–10 for guidance to determine the appropriate emergency level for a specific situation). The person making the contacts should initial and record the time of the call and who was notified for each contact made. See the *Notification Charts* tab for critical contact information and *Emer. Services Contacts* tab for contact information for other possible emergency services.

Emergency Level 1 (see page 12)	Person Contacted	Time Contacted	Contacted by
____ NRCS District Conservationist	_____	_____	_____
____ NRCS State Conservation Engineer	_____	_____	_____
____ Oklahoma Water Resources Board	_____	_____	_____

Emergency Level 2 (see page 13)	Person Contacted	Time Contacted	Contacted by
____ NRCS District Conservationist	_____	_____	_____
____ NRCS State Conservation Engineer	_____	_____	_____
____ Oklahoma Water Resources Board	_____	_____	_____
____ Sheriff	_____	_____	_____

Emergency Level 3 (see page 14)	Person Contacted	Time Contacted	Contacted by
____ Sheriff	_____	_____	_____
____ Oklahoma Water Resources Board	_____	_____	_____
____ NRCS District Conservationist	_____	_____	_____
____ NRCS State Conservation Engineer	_____	_____	_____

## Appendix A–2

### Unusual or Emergency Event Log (to be completed during the emergency)

Dam name: Rock Creek Watershed, Dam No. 23County: Coal County

When and how was the event detected? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Weather conditions: \_\_\_\_\_  
\_\_\_\_\_

General description of the emergency situation: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Emergency level determination: \_\_\_\_\_ Made by: \_\_\_\_\_

### Actions and Event Progression

Date	Time	Action/event progression	Taken by

Report prepared by: \_\_\_\_\_ Date: \_\_\_\_\_

## Appendix A–3

### Dam Emergency Situation Report

(to be completed following the termination of the emergency)

Dam name: Rock Creek Watershed, Dam No. 23

National Inventory of Dams (NID) No.: OK11111

Dam location: 2 miles South of Rock City  
(City)

Coal County  
(County)

Rock Creek  
(Stream/River)

Date: \_\_\_\_\_

Time: \_\_\_\_\_

Weather conditions: \_\_\_\_\_

General description of emergency situation: \_\_\_\_\_

Area(s) of dam affected: \_\_\_\_\_

Extent of dam damage: \_\_\_\_\_

Possible cause(s): \_\_\_\_\_

Effect on dam's operation: \_\_\_\_\_

Initial reservoir elevation: \_\_\_\_\_ Time: \_\_\_\_\_

Maximum reservoir elevation: \_\_\_\_\_ Time: \_\_\_\_\_

Final reservoir elevation: \_\_\_\_\_ Time: \_\_\_\_\_

Description of area flooded downstream/damages/injuries/loss of life: \_\_\_\_\_

Other data and comments: \_\_\_\_\_

Observer's name and telephone number: \_\_\_\_\_

Report prepared by: \_\_\_\_\_ Date: \_\_\_\_\_

## Appendix A–4: Glossary of Terms

<b>Abutment</b>	That part of the valley side against which the dam is constructed. The left and right abutments of dams are defined with the observer looking downstream from the dam.
<b>Acre-foot</b>	A unit of volumetric measure that would cover 1 acre to a depth of 1 foot. One acre-foot is equal to 43,560 cubic feet or 325,850 gallons.
<b>Berm</b>	A nearly horizontal step (bench) in the upstream or downstream sloping face of the dam.
<b>Boil</b>	A disruption of the soil surface due to water discharging from below the surface. Eroded soil may be deposited in the form of a ring (miniature volcano) around the disruption.
<b>Breach</b>	An opening through the dam that allows draining of the reservoir. A controlled breach is an intentionally constructed opening. An uncontrolled breach is an unintended failure of the dam.
<b>Conduit</b>	A closed channel (round pipe or rectangular box) that conveys water through, around, or under the dam.
<b>Control section</b>	A usually level segment in the profile of an open channel spillway above which water in the reservoir discharges through the spillway.
<b>Cross section</b>	A slice through the dam showing elevation vertically and direction of natural water flow horizontally from left to right. Also, a slice through a spillway showing elevation vertically and left and right sides of the spillway looking downstream.
<b>Dam</b>	An artificial barrier generally constructed across a watercourse for the purpose of impounding or diverting water.
<b>Dam failure</b>	The uncontrolled release of a dam's impounded water.
<b>Dam Operator</b>	The person(s) or unit(s) of government with responsibility for the operation and maintenance of dam.
<b>Drain, toe or foundation, or blanket</b>	A water collection system of sand and gravel and typically pipes along the downstream portion of the dam to collect seepage and convey it to a safe outlet.
<b>Drainage area (watershed)</b>	The geographic area on which rainfall flows into the dam.
<b>Drawdown</b>	The lowering or releasing of the water level in a reservoir over time or the volume lowered or released over a particular period of time.
<b>Emergency</b>	A condition that develops unexpectedly, endangers the structural integrity of the dam and/or downstream human life and property, and requires immediate action.

<b>Emergency Action Plan (EAP)</b>	A formal document identifying potential emergency conditions that may occur at the dam and specifying preplanned actions to minimize potential failure of the dam or minimize failure consequences including loss of life, property damage, and environmental impacts.
<b>Evacuation map</b>	A map showing the geographic area downstream of a dam that should be evacuated if it is threatened to be flooded by a breach of the dam or other large discharge.
<b>Filter</b>	The layers of sand and gravel in a drain that allow seepage through an embankment to discharge into the drain without eroding the embankment soil.
<b>Freeboard</b>	Vertical distance between a stated water level in the reservoir and the top of dam.
<b>Gate, slide or sluice, or regulating</b>	An operable, watertight valve to manage the discharge of water from the dam.
<b>Groin</b>	The area along the intersection of the face of a dam and the abutment.
<b>Hazard classification</b>	A system that categorizes dams (high, significant, or low) according to the degree of their potential to create adverse incremental consequences such as loss of life, property damage, or environmental impacts of a failure or misoperation of a dam.
<b>Height, dam</b>	The vertical distance between the lowest point along the top of the dam and the lowest point at the downstream toe which usually occurs in the bed of the outlet channel.
<b>Hydrograph, inflow or outflow, or breach</b>	A graphical representation of either the flow rate or flow depth at a specific point above or below the dam over time for a specific flood occurrence.
<b>Incident Commander</b>	The highest predetermined official available at the scene of an emergency situation.
<b>Instrumentation</b>	An arrangement of devices installed into or near dams that provide measurements to evaluate the structural behavior and other performance parameters of the dam and appurtenant structures.
<b>Inundation area or map</b>	The geographic area downstream of the dam that would be flooded by a breach of the dam or other large discharge.
<b>Notification</b>	To immediately inform appropriate individuals, organizations, or agencies about a potentially emergency situation so they can initiate appropriate actions.
<b>Outlet works (principal spillway)</b>	An appurtenant structure that provides for controlled passage of normal water flows through the dam.
<b>Piping</b>	The progressive destruction of an embankment or embankment foundation by internal erosion of the soil by seepage flows.

<b>Probable Maximum Precipitation (PMP) or Flood (PMF)</b>	The theoretically greatest precipitation or resulting flood that is meteorologically feasible for a given duration over a specific drainage area at a particular geographical location.
<b>Reservoir</b>	The body of water impounded or potentially impounded by the dam.
<b>Riprap</b>	A layer of large rock, precast blocks, bags of cement, or other suitable material, generally placed on an embankment or along a watercourse as protection against wave action, erosion, or scour.
<b>Risk</b>	A measure of the likelihood and severity of an adverse consequence.
<b>Seepage</b>	The natural movement of water through the embankment, foundation, or abutments of the dam.
<b>Slide</b>	The movement of a mass of earth down a slope on the embankment or abutment of the dam.
<b>Spillway (auxiliary or emergency)</b>	The appurtenant structure that provides the controlled conveyance of excess water through, over, or around the dam.
<b>Spillway capacity</b>	The maximum discharge the spillway can safely convey with the reservoir at the maximum design elevation.
<b>Spillway crest</b>	The lowest level at which reservoir water can flow into the spillway.
<b>Tailwater</b>	The body of water immediately downstream of the embankment at a specific point in time.
<b>Toe of dam</b>	The junction of the upstream or downstream face of an embankment with the ground surface.
<b>Top of dam (crest of dam)</b>	The elevation of the uppermost surface of an embankment which can safely impound water behind the dam.

## Appendix B–1: Resources Available

Locally available equipment, labor, and materials:

The County Commissioners have the following resources that can be utilized in the event of an emergency:

- two front-end loaders
- two backhoes
- one track hoe
- two graders
- two dump trucks
- a sand borrow pit
- a clay borrow pit

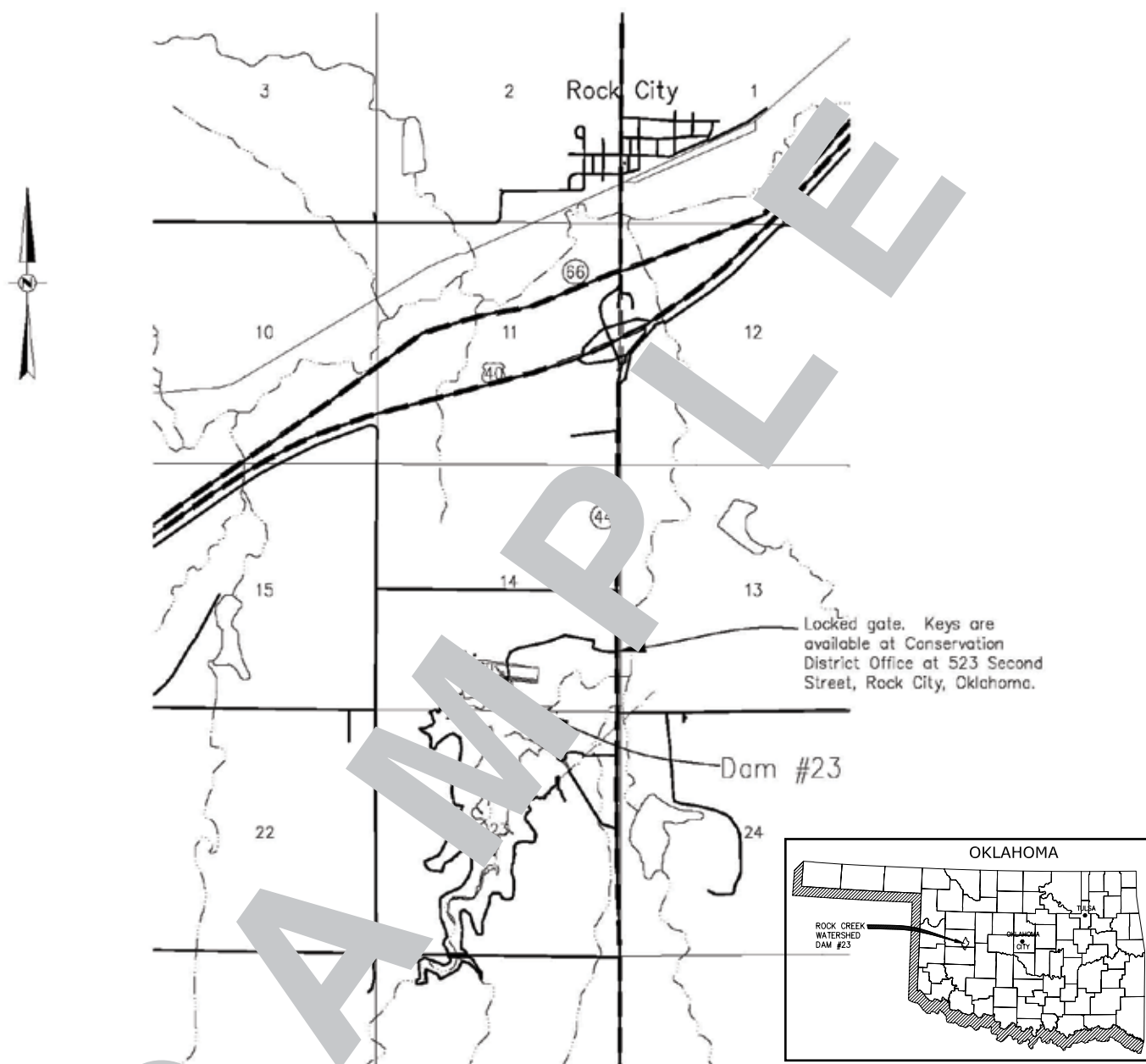
Contact the Coal County Road Department—see *Emergency Services Contacts*, page 16.

Other locally available resources include:

<b>Heavy equipment service and rental</b>	<b>Sand and gravel supply</b>	<b>Ready-mix concrete supply</b>
Bob's Dozer Service	Kern's Sand and Gravel	Burnett Concrete Co.
134 Elm Street Rock City, OK	R.R. 2 Rock City, OK	231 Sixth Street Dry Gulch, OK
407-555-XXXX	407-555-XXXX	407-555-XXXX
Tiller Construction Co.	Renfro Sand Products	
405 Second Street Dry Gulch, OK	334 Aston Avenue Spring Lake, OK	
407-555-XXXX	407-555-XXXX	
<b>Pumps</b>	<b>Diving contractor</b>	<b>Sand bags</b>
A to Z Rental	Steve White	A to Z Rental
569 Seventh Street Rock City, OK	2201 56th Street Johnstown, OK	5643 Water Street Johnstown, OK
407-555-XXXX	917-555-XXXX	917-555-XXXX



## Appendix B–2: Location and Vicinity Maps

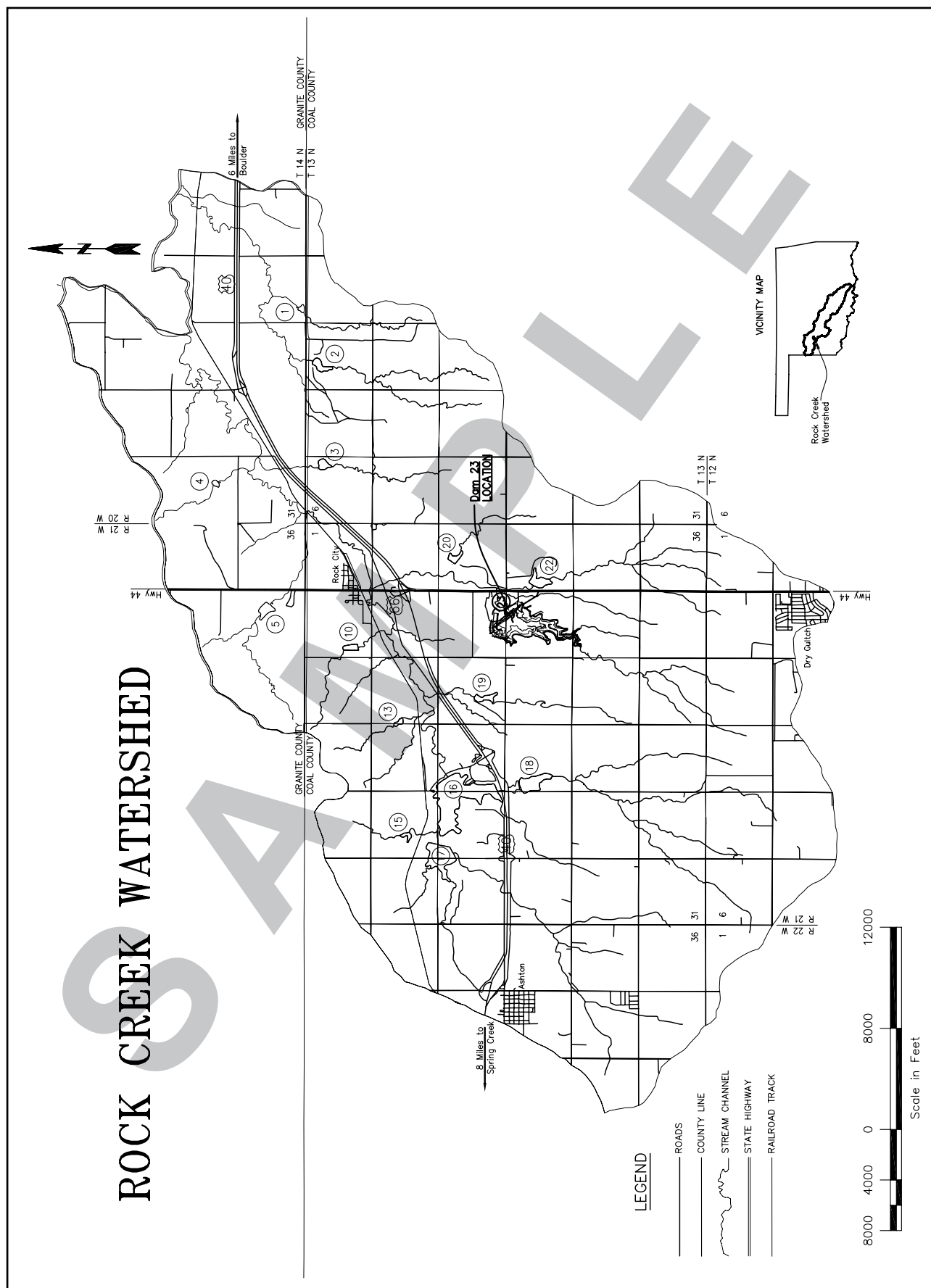


### VICINITY MAP

Dam #23 is located approximately 2 miles South and 1/2 mile West of Rock City, Coal County, Oklahoma, in Sections 14 & 23, Township 13 North, Range 21 West.

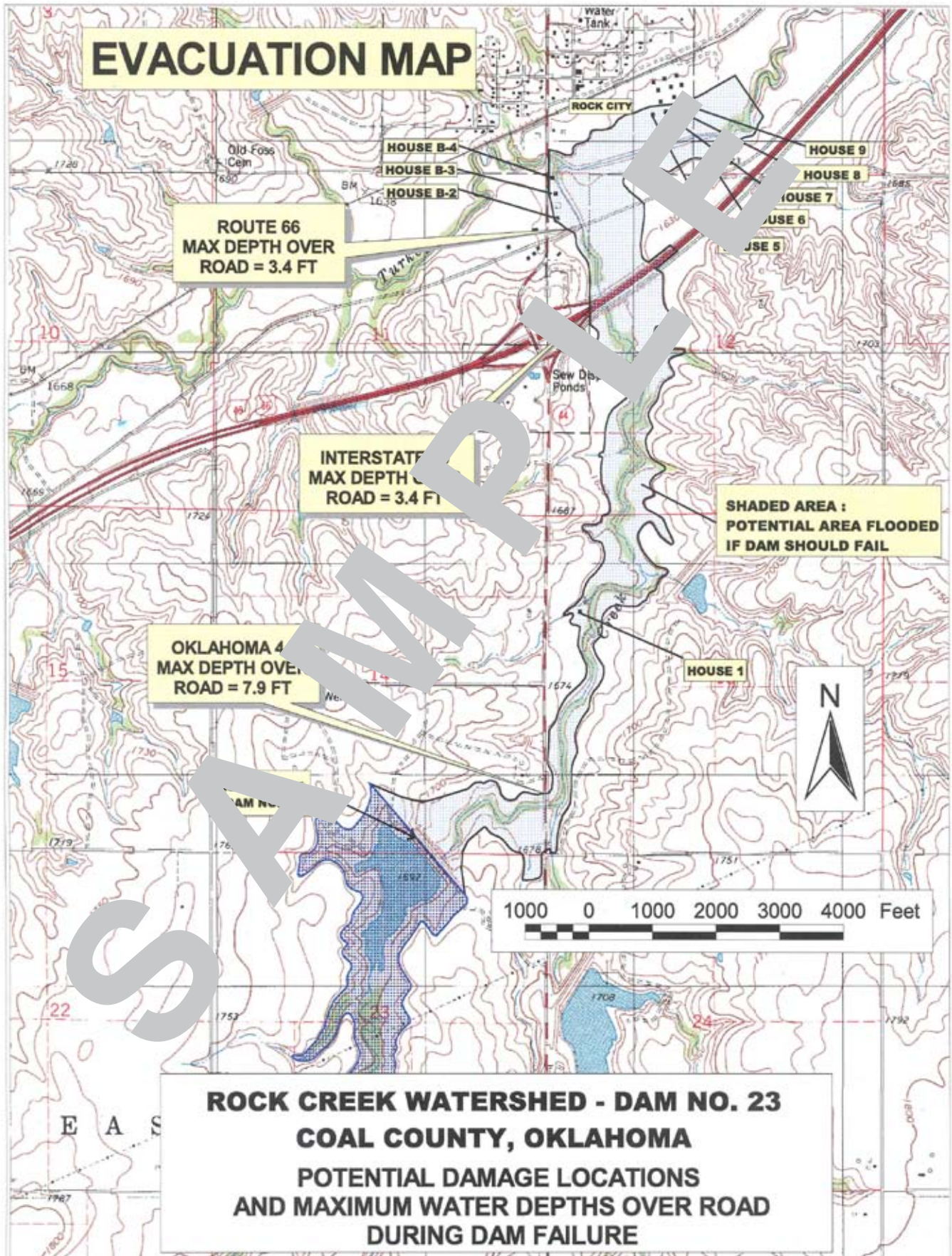


# Appendix B–3: Watershed Project Map





## Appendix B–4: Evacuation Map



## Appendix B–5: Residents/Businesses/Highways at Risk

A major flood caused by a sudden breach of the dam is estimated to inundate six homes, three businesses, and three highways. These homes and businesses (marked on the evacuation map) are located east of OK Highway 44 and south of Chestnut Street in Rock City.

House/ business no.*	Resident/ business	Address	Phone no.	Distance downstream from dam (ft)	Travel time ** (hr)	Max water depth above first floor (ft)
1	Fred and Ethel James	10300 132nd Street	555–XXXX	5,000	0.3	5.4
B-2	Larry's Hardware	3214 Chestnut Street	555–XXXX	11,400	0.9	0.8
B-3	Lori's Music Shop	2288 Farm Road	555–XXXX	11,600	0.9	2.6
B-4	Bill's Coffee Shop	1455 Sugar Street	555–XXXX	11,800	1.0	4.8
5	Terry and Ann Smith	4812 Chestnut Street	555–XXXX	13,600	1.1	3.0
6	Amos Hill	5500 Apple Road	555–XXXX	14,000	1.1	3.2
7	Allen and Ruth Jones	4814 Chestnut Street	555–XXXX	13,800	1.1	1.2
8	Mike and Carol Green	4902 Chestnut Street	555–XXXX	14,000	1.1	2.4
9	Stephanie Evans	4910 Chestnut Street	555–XXXX	14,200	1.1	0.5
	OK Highway 44			2,000	0.2	7.9
	Interstate 40			10,000	0.8	3.4
	OK Route 66			11,200	0.9	3.4

\* See appendix B–4.

\*\* Estimated time for breach wave (peak) to travel from dam to downstream locations

### Basis for computation of evacuation area and flooding depths

Breach inundation study completed by NRCS–August 2004

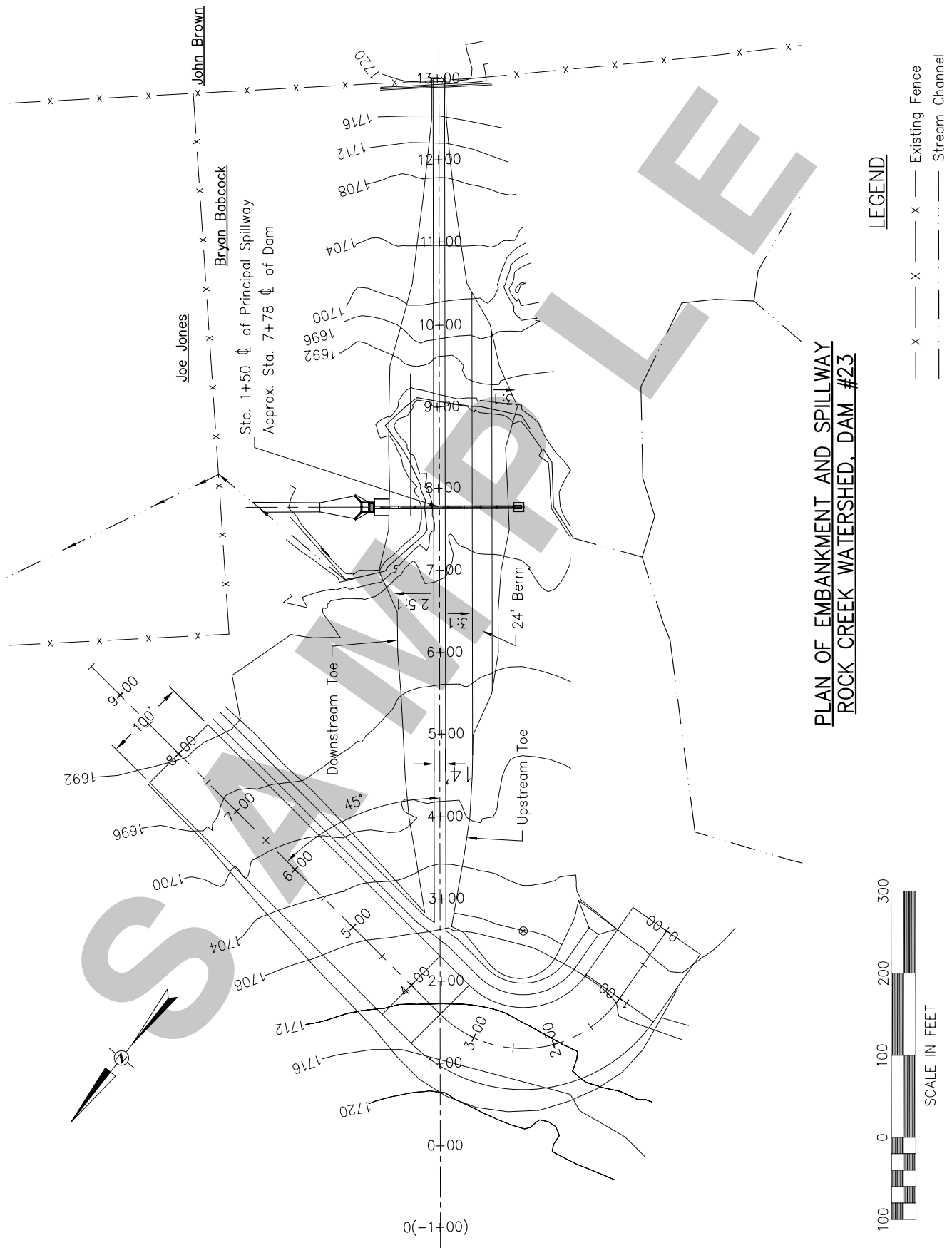
Hydraulic model used: NRCS TR–20 (routing); TR–60 (peak discharge); TR–66 (hydrograph)

Model assumptions:

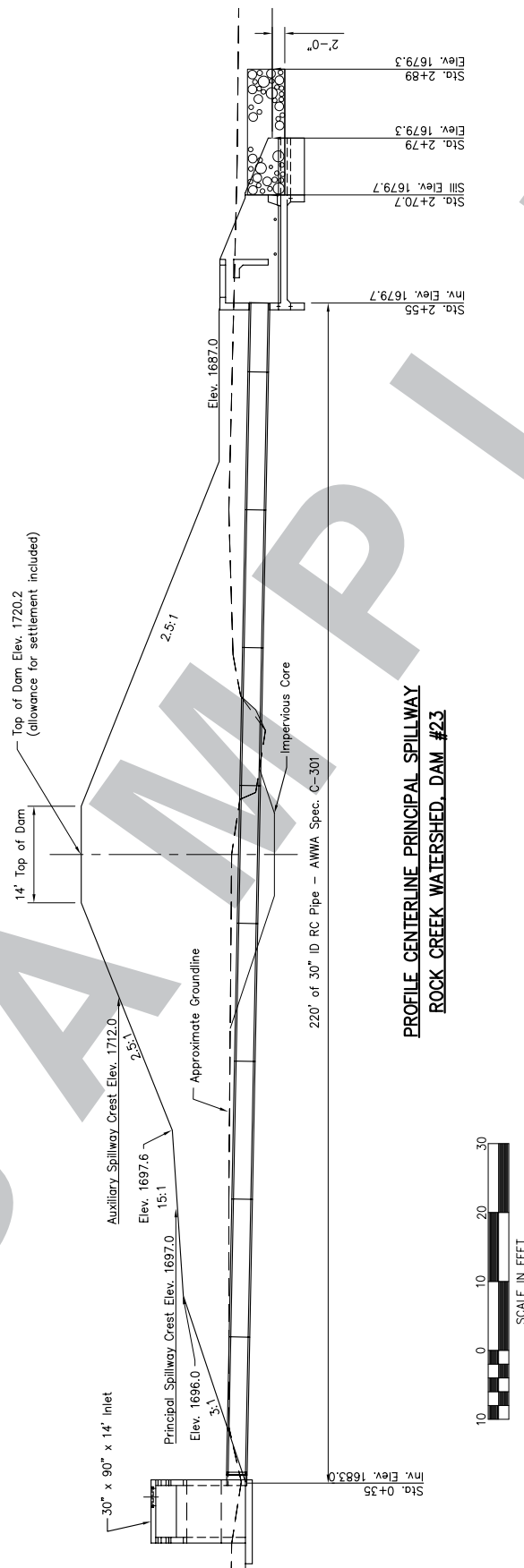
- “Sunny Day” Breach (no inflow into the reservoir)
- Water surface in reservoir prior to breach = 1,770.2 (top of dam)
- Total volume of breach hydrograph = 2,340 acre-ft
- Height of water at time of breach = 36 ft
- Peak breach discharge = 49,700 ft<sup>3</sup>/s
- Downstream area defined by field surveys consisting of 10 cross sections and 3 bridge openings



# Appendix B-6: Plan View of Dam



# Appendix B–7: Profile of Principal Spillway



# Appendix B–8: Reservoir Elevation-area-volume and Spillway Capacity Data

## ROCK CREEK WATERSHED DAM NO. 23

Elevation	Reservoir Surface acres	Reservoir Storage acre-ft	Spillway Discharge ft <sup>3</sup> /s
1682.0	0.0	0.0	0
1684.0	0.3	0.3	0
1686.0	2.0	2.5	0
1688.0	3.7	8.2	0
1690.0	8.6	20.5	0
1692.0	15.9	45.0	0
1694.0	18.7	79.6	9
1696.0	23.5	121.8	0
Principal Spillway Crest			
1697.0	26.2	146.7	0
1698.0	31.1	175.4	45
1700.0	40.8	247.3	76
1702.0	49.3	337.4	82
1704.0	62.0	448.7	87
1706.0	71.4	582.1	92
1708.0	86.7	740.2	97
1710.0	98.6	925.5	102
Auxiliary Spillway Crest			
1712.0	115.0	1139.1	108
1714.0	129.9	1384.0	516
1716.0	145.3	1659.2	2090
1718.0	160.7	1965.2	4437
1720.0	178.8	2304.7	7763
1720.2	180.6	2340.6	7937

## Appendix B–9: National Inventory of Dams (NID) Data

Dam name: **Rock Creek 23**

State: **OK**

NID ID: **OK11111**

Longitude: **–99.19802**

Latitude: **35.42875**

Geodetic location: **S23 T13N R21W**

County: **Coal**

Stream: **Rock Creek**

Nearest town: **Rock City**

Distance to nearest town: **2 mi**

Operator: **Coal County Cons. Distr.**

Year constructed: **1960**

Max. discharge: **2,090 ft<sup>3</sup>/s**

Max. storage: **2,340 acre-ft**

Normal storage: **147 acre-ft**

Surface area: **26 acre**

Drainage area: **7.7 mi<sup>2</sup>**

Inspection frequency: **1 yr**

State regulated?: **Yes**

State reg. agency: **Oklahoma Water Resources Board**

Federal funding: **USDA NRCS**

Federal design: **USDA NRCS**

Federal constructed: **USDA NRCS**

Program authority: **Flood prevention**

Watershed No.: **3015**

Watershed name: **Rock Creek**

Service life: **50 yr**

O&M insp. resp.: **Coal Co. Cons. Distr.**

O&M insp. current?: **Yes**

Population at risk: **45**

Dam height: **40.7 ft**

Dam length: **1,030 ft**

Dam volume: **62,367 yd<sup>3</sup>**

Design hazard potential: **High**

Current hazard potential: **High**

Hazard potential class. year: **2006**

Sediment storage: **152 acre-ft**

Flood storage: **987 acre-ft**

Surcharge storage: **1,201 acre-ft**

Other storage: **0 acre-ft**

Principal spillway type: **Concrete pipe**

Principal spillway conduit diameter: **30 in**

Auxiliary spillway type: **Vegetated earth**

Auxiliary spillway width: **100 ft**