



BURGESS & NIPLE

Emergency Action Plan

Roaming Rock Shores Lake Dam

Village of Roaming Shores

October 2008



**EMERGENCY ACTION PLAN
ROAMING ROCK SHORES LAKE DAM**

**PREPARED FOR
VILLAGE OF ROAMING SHORES
ASHTABULA COUNTY, OHIO**

OCTOBER 2008

**BURGESS & NIPLE, INC.
Engineers and Architects
5085 Reed Road
Columbus, Ohio 43220**

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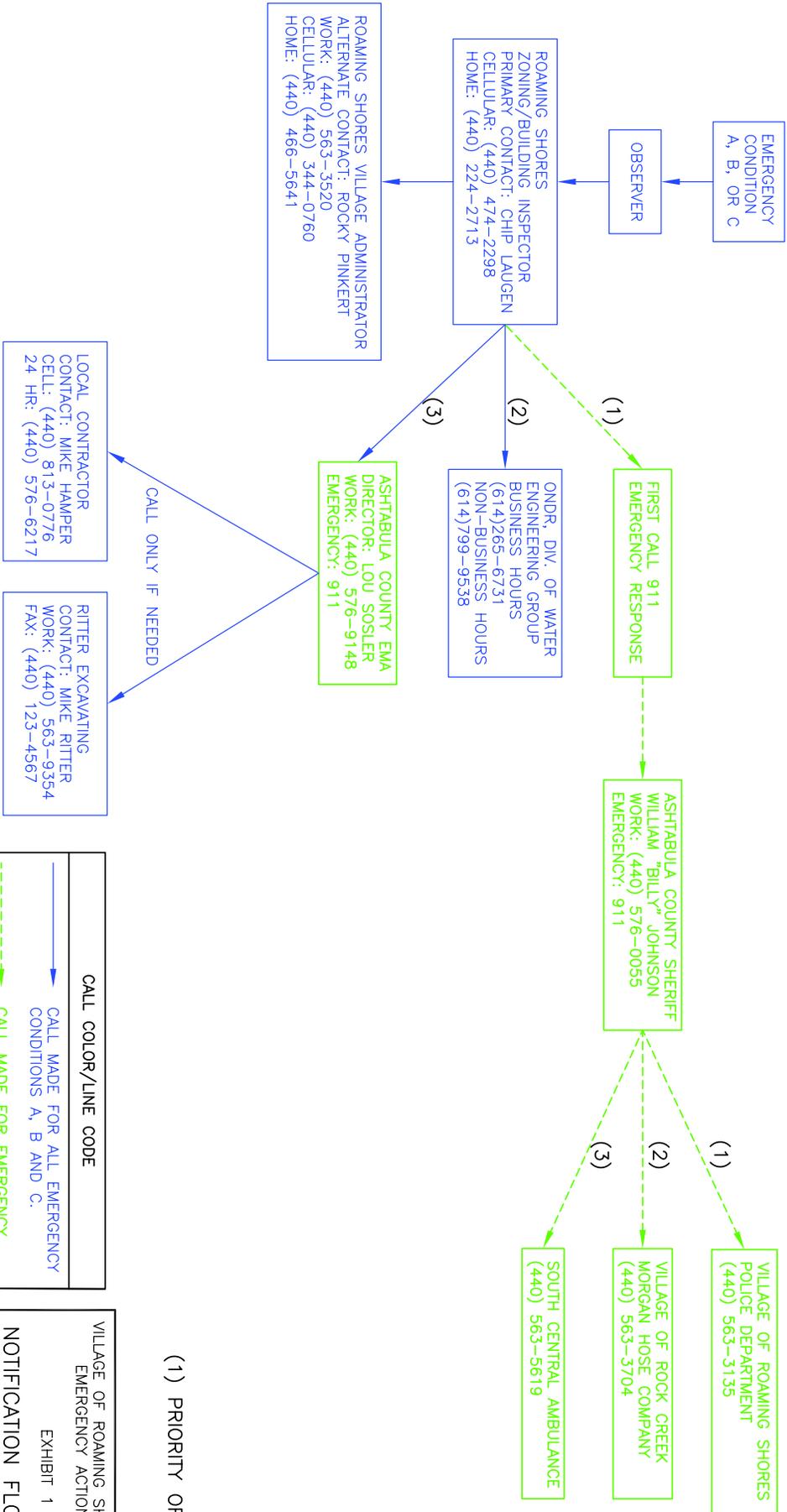
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EMERGENCY CONDITIONS A, B OR C

CONDITION A: NONFAILURE EMERGENCY
 CONDITION B: POTENTIAL FAILURE EMERGENCY
 CONDITION C: IMMINENT FAILURE OR FAILURE HAS OCCURRED EMERGENCY



CALL COLOR/LINE CODE
CALL MADE FOR ALL EMERGENCY CONDITIONS A, B AND C. CALL MADE FOR EMERGENCY CONDITIONS B AND C ONLY.

VILLAGE OF ROAMING SHORES, OHIO EMERGENCY ACTION PLAN EXHIBIT 1 NOTIFICATION FLOWCHART BURGESS AND NIPL, INC. DATE: OCT. 2008
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(1) PRIORITY OF CALL

I. NOTIFICATION FLOWCHART

A. General

Exhibit 1 is the Notification Flowchart for potential emergency conditions at the Roaming Rock Shores Lake Dam at the Village of Roaming Shores, Ashtabula County, Ohio. The Notification Flowchart provides the hierarchy for notification in the event of an emergency for the following conditions:

- Condition A: Nonfailure Emergency Condition.
- Condition B: Potential Failure Condition.
- Condition C: Imminent Failure or Failure Has Occurred Condition.

Section IV of this Emergency Action Plan (EAP) provides further descriptions of these conditions.

B. Sample Messages

In the event of an emergency condition at the dam, the following notifications shall be made. Sample messages are provided below to expedite transfer of accurate and timely information in the event of such a situation. Underlined items are provided to indicate where information specific to the caller or call must be given.

1. Emergency Condition A – Nonfailure Emergency Condition

- a. **Standby Alert Notification from Village to Ohio Department of Natural Resources (ODNR).** “This is Chip Laugen/Rocky Pinkert/(your name) of the Village of Roaming Shores in Ashtabula County. I am calling to advise you that we are starting constant surveillance of the Roaming Rock Shores Lake Dam according to our Emergency Action Plan due to a nonfailure emergency condition at the dam. At this time, we do not anticipate that the dam will fail, but are notifying you so you are aware of the situation. We will call you again if the condition worsens, if a decision to evacuate is made, or when

cancellation of this standby alert has been made.” *(Note, be prepared to provide additional information to ODNR regarding the nature of the emergency condition).*

2. **Emergency Condition B – Potential Failure Condition**

a. **Notification from Village to “911.”** “This is Chip Laugen/Rocky Pinkert/(your name) of the Village of Roaming Shores in Ashtabula County. I am calling to notify you that we have a potential failure condition of the Roaming Rock Shores Lake Dam. Please note that this is NOT presently an evacuation situation and we will call again if it becomes necessary to evacuate potential flood prone areas.”

b. **Notification from Village to ODNR.** “This is Chip Laugen/Rocky Pinkert/(your name) of the Village of Roaming Shores in Ashtabula County. I am calling to notify you that a potential failure condition exists at the Roaming Rock Shores Lake Dam. We have initiated notifications according to our Emergency Action Plan. We will call you again to inform you if the condition worsens, if a decision to evacuate is made, or when cancellation of this standby alert has been made.” *(Note, be prepared to provide additional information to ODNR regarding the nature of the emergency condition).*

c. **Potential Evacuation Notification from Village to Ashtabula County Emergency Management Agency (EMA) Director.** “This is (your name) of the Village of Roaming Shores in Ashtabula County. I am calling to notify you that a potential failure condition exists at the Roaming Rock Shores Lake Dam. We have been directed to notify you so that you are aware of the potential failure condition of the dam so preparation measures can be taken if an evacuation notice is issued. Please note this is NOT presently an evacuation situation and we will call again if it becomes necessary to evacuate potential flood prone areas.” *(Note, be prepared to provide additional information to the contractors regarding the nature of the emergency condition).*

- d. **Notification from “911” to Ashtabula County Sheriff.** “This is (your name) of “911” I am calling to notify you that there is a potential failure condition at the Roaming Rock Shores Lake Dam. We have been directed to notify you that a potential failure condition exists at the dam so that you can be prepared if an evacuation notice is issued. Please note this is NOT presently an evacuation situation and we will call again if it becomes necessary to evacuate potential flood prone areas. Please check your agency’s copy of the dam’s Emergency Action Plan, specifically Appendix A, for maps of potential flooded areas in case an evacuation order is given. These maps indicate areas which may be flooded and would require evacuation should it become necessary. Again, this is NOT an evacuation condition at this time.”

3. **Emergency Condition C – Imminent Failure or Failure Has Occurred Condition**

- a. **Notification from Village to “911.”** “This is Chip Laugen/Rocky Pinkert/your name) of the Village of Roaming Shores in Ashtabula County. I am calling to notify you that failure of the Roaming Rock Shores Lake Dam is imminent/has occurred. Please notify all available emergency personnel according to the Emergency Action Plan for the dam. Specific details can be found in the Notification Flowchart, Exhibit 1 in the Emergency Action Plan. Evacuation of flood prone areas downstream of the dam as shown in the Emergency Action Plan should be started immediately.”
- b. **Notification from Village to ODNR.** “This is Chip Laugen/Rocky Pinkert/your name) of the Village of Roaming Shores in Ashtabula County. I am calling to notify you that failure of the Roaming Rock Shores Lake Dam is imminent/has occurred. We have already notified “911” according to the Emergency Action Plan for the dam. We have told them that evacuation of flood prone areas (as shown in the Emergency Action Plan) should be started immediately.” *(Note, be*

prepared to provide additional information to ODNR regarding the nature of the emergency condition).

- c. **Evacuation Notification from Village of Roaming Shores to Ashtabula County EMA Director.** “This is Chip Laugen/Rocky Pinkert/(your name) of the Village of Roaming Shores in Ashtabula County. I am calling to notify you that an evacuation order for the potential flooding area downstream of Roaming Rock Shores Lake Dam was given by the Roaming Shores Village Administrator at (time). Please notify and evacuate the residents in the flood prone areas according to the Emergency Action Plan.”

- d. **Notification from Village of Roaming Shores to Local Contractors.** “This is (your name) of the Village of Roaming Shores. I am calling to notify you that an evacuation order for the Roaming Rock Shores Lake Dam downstream flooding area was given by the Roaming Shores Village Administrator at (time). Your contracting services are needed at this time. Please respond as quickly as possible.” *(Note, be prepared to provide additional information to the contractors regarding the nature of the emergency condition and what equipment and supplies you need).*

- e. **Notification from “911” to the Ashtabula County Sheriff.** “This is (your name) of “911” I am calling to notify you that an evacuation order for the Roaming Rock Shores Lake Dam downstream flooding area was given by the Roaming Shores Village Administrator at (time). Please notify the emergency response services including the Village of Roaming Shore Police Department, The Village of Rock Creek, and the South Central Ambulance district according to the Emergency Action Plan. Maps of potentially flooded areas are in Appendix A of the dam’s Emergency Action Plan. You can use the maps to determine areas from which people should be evacuated. Again, we are asking you to begin the evacuations immediately.”

- f. **Notification from Ashtabula County Sheriff to Roaming Shores Police Department, Morgan Hose Company, and South Central Ambulance District.** “This is Sheriff (your name). I am calling to notify you that an evacuation order for the Roaming Rock Shores Lake Dam downstream flooding area was given by the Roaming Shores Village Administrator at (time). Please notify and evacuate the residents immediately from the flood prone areas according to the Emergency Action Plan. Maps of potentially flooded areas are in Appendix A of the dam’s Emergency Action Plan. You can use the maps to determine areas from which people should be evacuated. Again, we are asking you to begin the evacuations immediately.”
- g. **Evacuation Notification by Police and Fire Departments to Residents.** “An evacuation order for the Roaming Rock Shores Lake Dam flood prone area has been given. Please evacuate this area to higher ground immediately. This is an emergency. Please leave now!”

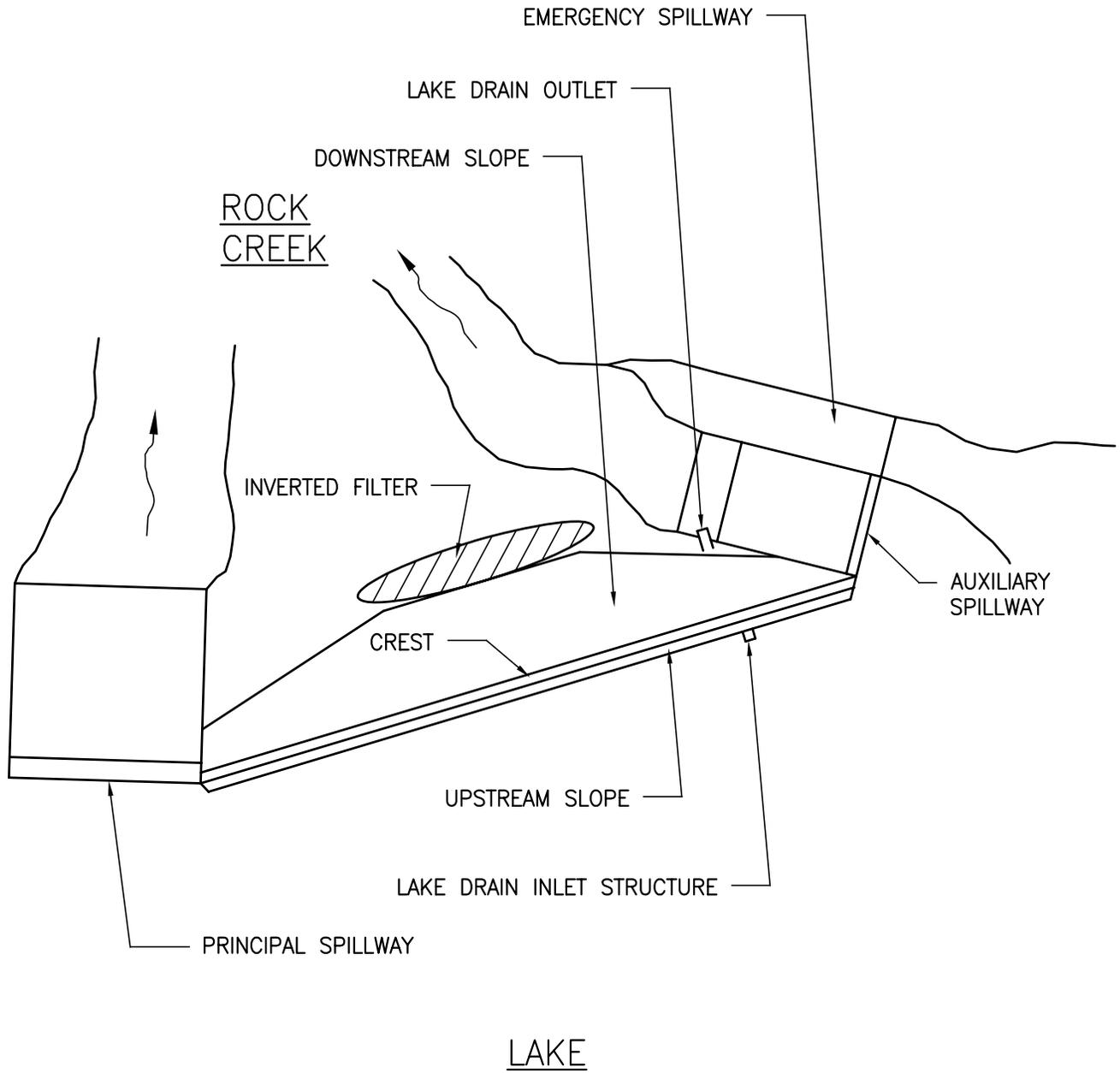
II. STATEMENT OF PURPOSE

The purpose of this EAP is to safeguard lives and to reduce damage to the property of the citizens of Ashtabula County who live or are traveling in close proximity to the Roaming Rock Shores Lake Dam in the event of failure of the dam or flooding caused by large flow releases from the dam. The EAP was prepared to meet the requirements of the ODNR for an EAP as provided in Ohio Administrative Code (OAC) 1501:21-15-07 and 1501:21-21-04 and as further detailed in ODNR's EAP Guidelines.

III. PROJECT DESCRIPTION

Roaming Rock Shores Lake Dam is owned by the Village of Roaming Shores, Ohio and is located in southwest Ashtabula County, Ohio. Exhibit 2 shows the location of the dam. The dam is approximately 0.4 mile upstream of the Village of Rock Creek and controls a drainage area of 73.5 square miles. Roaming Rock Shores Lake is the largest private lake in Ohio with more than 19 miles of shoreline.

The dam is a 45-foot high, 730-foot long earthfill embankment dam constructed in 1967. Exhibit 3 is a plan view of the dam. The outlet works consists of a principal, auxiliary, and emergency spillway, as well as a 30-inch lake drain. The principal spillway is a 180-foot concrete ogee weir located on the left end of the embankment with a crest elevation of 850.0, corresponding to 6,091-acre-feet of storage. The auxiliary spillway is a 110-foot concrete ogee weir located on the right end of the embankment with a crest elevation of 852.0, corresponding to 7,200-acre-feet of storage. The emergency spillway is an 80-foot wide open channel located to the right of the auxiliary spillway, with a crest elevation of 854.0, and a corresponding 8,300-acre-foot of storage. The top of the dam is at Elevation 861.0 with a capacity of 12,000-acre-feet of storage. The outflow discharges into Rock Creek and flows 2.4 miles before joining the Grand River.



VILLAGE OF ROAMING SHORES, OHIO
EMERGENCY ACTION PLAN

EXHIBIT 3

SITE PLAN

NOT TO SCALE
DATE: OCT. 2008

BURGESS AND NIPLE, INC.

IV. EMERGENCY CONDITIONS AND CLASSIFICATIONS

If any of the following conditions are developing, appear imminent or have occurred, implement the notification plan immediately. Emergency conditions shall be classified as follows:

A. Condition A: Nonfailure Emergency Condition

1. Emergency conditions with no immediate threat to the integrity of the dam; such as:
 - a. Water impounding behind the dam such that flow is 1-foot deep or more over the auxiliary spillway. (Spillway crest elevation is 852.0.)
 - b. Cracks develop in spillway, buttresses, and/or foundations but seepage is not present.
 - c. Obstructions present at principal, auxiliary, and/or emergency spillway.
 - d. Sinkhole develops downstream with no water present.
 - e. Structural damage to stilling basin.
 - f. Severe erosion downstream of dam.
 - g. Lake drain is not functioning properly but there is not a flood threat.

B. Condition B: Potential Failure Condition

1. Failure may occur but corrective measures may prevent or mitigate failure; such as:
 - a. Water is flowing over the emergency spillway (Elevation 854.0.)
 - b. Seepage through the dam embankment and/or foundation at a rate of less than 25 gallons per minute (gpm) but no soil particles are observed.
 - c. Unusual crack develops in the embankment and/or foundation with minor seepage (wet spots on the surfaces) or controllable flow is observed.
 - d. Water is observed in sinkhole downstream but there are no soil particles in the water.

- e. A large slump or slide develops in the embankment and threatens to release the impounded water.
- f. A clear discharge is observed at the toe of the embankment.

C. Condition C: Imminent Failure or Failure has Occurred Condition

- 1. No time is available to attempt corrective measures; such as:
 - a. Water level is within 2 feet of the top of dam.
 - b. Uncontrolled water flows through cracks in the embankment and/or foundation steadily increasing in size and volume.
 - c. Water in observed sinkhole downstream where soil particles are noted in the water.
 - d. Water flow from the drains in the gallery is carrying soil particles.
 - e. Large or multiple slumps or slides are observed and continuing to enlarge.
 - f. Whirlpool is observed in the impounded water.
 - g. Dam sections are displaced or separated.
- 2. Evacuation should be implemented immediately.

V. GENERAL RESPONSIBILITIES

A. Responsibility for Notification

Potential concerns for the integrity of the dam may be observed by village staff during regular maintenance and/or inspections, by local police during their general rounds, or by a member of the general public who reports a potential concern for the safety of the dam. Once the concern is relayed to the Village, it shall be the Fire Safety Officer's responsibility to lead the Village's response actions. If the Fire Safety Officer is not available or able to lead the response, then the Village Administrator, or next highest ranking Village official, shall have that responsibility.

The Roaming Shores Village Fire Safety Officer would likely be the first person notified of a potential problem at the dam and would be the first person on the scene. The Fire Safety Officer (or his designee) will initiate the notification procedures according to the Notification Flowchart. The Fire Safety Officer will have key personnel proceed to the dam for surveillance and corrective measures. If the Fire Safety Officer observes that dam failure is imminent before county personnel arrive, he would notify the emergency agencies and initiate the evacuation plan.

B. Roaming Rock Shores Lake Dam Owner Responsibilities

1. EAP Coordinator

The Village Administrator shall be the EAP Coordinator and shall be responsible for:

- a. Reviewing and updating the EAP, see Appendix B.
- b. Establishing a training program for Village personnel to make them familiar with the EAP and knowledgeable of the tasks to be performed in the event of an emergency at the dam, in accordance with Appendix B of this EAP.
- c. Preparing the annual emergency preparedness exercise as described in Appendix B.
- d. Serving as the EAP contact person.

2. **Emergency Response Director**

The Village Fire Safety Officer shall serve as the Emergency Response Director in the event of an emergency condition at the dam. The Village Administrator shall serve as the back-up Emergency Response Director. In the event that neither of these individuals is available, the ranking village staff person shall take responsibility to make appropriate notifications and to request assistance from the ODNR and/or a Professional Engineer.

The Emergency Response Director shall:

- a. Determine initial emergency condition classification and continue to evaluate condition.
- b. Provide for constant surveillance of the dam.
- c. Contact Ashtabula County officials and ODNR to describe the emergency situation at the dam.
- d. Direct corrective actions at the dam in consultation with a Professional Engineer and ODNR.
- e. Call emergency contractor(s) to the dam for remedial corrective measures.
- f. If failure is imminent and Ashtabula County EMA representatives are not at the dam site, contact the emergency agencies to initiate the evacuation plan.
- g. Terminate emergency status at the dam.

C. **William Johnson, Ashtabula County Sheriff**

- a. Coordinate with Ashtabula County EMA, 911 Emergency Response, and ODNR.
- b. Maintain communication with local Police Departments.

D. Responsibility for Evacuation

1. Ashtabula County EMA– Primary Responsibility.

- a. Due to the short travel time of the flood wave, the Ashtabula County EMA should activate the Ashtabula County Crisis Communication System.
- b. Coordinate evacuation notifications.
- c. In addition, the EMA should serve as the primary agency for establishing emergency shelters and services for persons displaced by the emergency.

2. Ashtabula County Sheriff , William Johnson– Primary Responsibility.

- a. Due to the short travel time of the flood wave, the Ashtabula County Sheriff should coordinate with the Ashtabula County EMA in conjunction with notifying all residents of evacuation by loud-speaker-equipped squad cars while safety personnel are being deployed.
- b. The Sheriff shall maintain communication with local Police Departments.

3. Village of Roaming Shores Police – Secondary Responsibility.

- a. Assist Ashtabula County Sheriff with evacuation of residents as needed.

4. Other Agencies Listed on the Notification Flowchart.

- a. Assist with evacuation and rescue as directed by the Ashtabula County Sheriff or EMA and as required by the emergency condition.

E. Responsibility for Termination

The Village’s Emergency Response Director, or ranking member of the Village administration, will be responsible for cancellation of the emergency condition after consultation with ODNR and determination that the threat of dam failure or any additional downstream damage has been minimized.

The emergency agencies shall be notified by the Village’s Emergency Response Director or county personnel once this has been concluded.

F. Agency Duties

The following table lists potential duties that each agency may be called upon to perform should an emergency condition arise at the Roaming Rock Shores Lake Dam. The hierarchy of notification can be found in the Notification Flowchart (see Section I, Exhibit 1).

1. Duties and Responsibilities for Condition A: Nonfailure Emergency

Organization	Condition A Duties
Village of Roaming Shores	<ul style="list-style-type: none"> • Notify ODNR at beginning of emergency condition • Coordinate response activities at the dam • Mobilize local contractors if needed • Notify ODNR when emergency condition ends.
ODNR	<ul style="list-style-type: none"> • Monitor events at the dam • Offer technical advice to Village staff.
Local Contractors 1. Mike Hamper 2. Ritter Excavating	<ul style="list-style-type: none"> • Provide construction equipment, materials, and personnel to assist Village staff in responding to the emergency condition. • The Ashtabula County EMA maintains a Resource Manual which lists additional contractors and resources that can be utilized in the event of an emergency at the dam.

2. Duties and Responsibilities for Condition B: Potential Failure

Organization	Condition B Duties
Village of Roaming Shores	<ul style="list-style-type: none"> • Notify “911” emergency center and ODNR at beginning of emergency condition • Coordinate response activities at the dam • Mobilize local contractors if needed • Notify ODNR, EMA, and other agencies when emergency condition ends.
ODNR	<ul style="list-style-type: none"> • Monitor events at the dam • Offer technical advice to Village staff.
Local Contractors 1. Mike Hamper 2. Ritter Excavating	<ul style="list-style-type: none"> • Provide construction equipment, materials, and personnel to assist Village staff in responding to the emergency condition. • The Ashtabula County EMA maintains a Resource Manual which lists additional contractors and resources that can be utilized in the event of an emergency at the dam.
“911” Emergency Center	<ul style="list-style-type: none"> • Notify the Ashtabula County Emergency Management Agency and the Village of Roaming Shores Police Department of the emergency condition.
1. Ashtabula County EMA 2. Village of Roaming Shores Police Dept.	<ul style="list-style-type: none"> • Ashtabula County EMA to notify the following of the emergency condition: <ul style="list-style-type: none"> - Village of Rock Creek Morgan Hose Company, and - Ashtabula County Sheriff.

Organization	Condition B Duties
1. Village of Rock Creek Morgan Hose Company 2. Ashtabula County Sheriff	<ul style="list-style-type: none"> Review the flood inundation maps contained in Appendix A of the dam's EAP to be familiar with areas that may require evacuation if an evacuation order is given. At this level, NO EVACUATION IS REQUIRED.

3. **Duties and Responsibilities for Condition C: Imminent Failure or Failure of the Dam**

Organization	Condition C Duties
Village of Roaming Shores	<ul style="list-style-type: none"> Notify "911" emergency center and ODNR at beginning of emergency condition Coordinate response activities at the dam Mobilize local contractors if needed Notify ODNR, EMA, and other agencies when emergency condition ends Complete follow-up reporting to ODNR.
ODNR	<ul style="list-style-type: none"> Monitor events at the dam Offer technical advice to Village staff.
Local Contractors 1. Mike Hamper 2. Ritter Excavating	<ul style="list-style-type: none"> Provide construction equipment, materials, and personnel to assist Village staff in responding to the emergency condition. The Ashtabula County EMA maintains a Resource Manual which lists additional contractors and resources that can be utilized in the event of an emergency at the dam.
"911" Emergency Center	<ul style="list-style-type: none"> Notify the Ashtabula County Emergency Management Agency and the Village of Roaming Shores Police Department of the emergency condition.
1. Ashtabula County EMA and 2. Village of Roaming Shores Police Dept.	<ul style="list-style-type: none"> Ashtabula County EMA to notify the following of the of the emergency condition: <ul style="list-style-type: none"> Village of Rock Creek Morgan Hose Company and Ashtabula County Sheriff Ashtabula County EMA to coordinate community evacuation and response activities of all available response organizations Police Dept. to assist Village officials in response actions.
1. Village of Rock Creek Morgan Hose Company 2. Ashtabula County Sheriff	<ul style="list-style-type: none"> IMMEDIATELY BEGIN EVACUATION of flood prone areas downstream of the dam as shown on the flood inundation maps contained in Appendix A of the dam's EAP Evacuation activities may include physical evacuation, calling, knocking on doors, announcements with bullhorns, etc.
1. Harpersfield Township Fire Dept. 2. Trumbull Township Fire Dept. 3. Rome Township Fire Dept.	<ul style="list-style-type: none"> Assist Ashtabula County Sheriff in notifying residents downstream of the dam to evacuate Assist in response activities such as resident evacuation, rescue of stranded residents, placing sandbags, and other duties as required.
1. SCAD Ambulance 2. NAD Ambulance	<ul style="list-style-type: none"> Assist in evacuating sick, elderly, and/or disabled residents and other duties as required.

VI. PREPAREDNESS

A. Access to the Site

The Roaming Rock Shores Lake Dam can be accessed via the grassy areas behind the Village Administration building.

B. Emergency Corrective Measures

1. High Pool Levels/Overtopping Condition

- a. Open the lake drain to lower the pool level. Pumps and/or siphons may be necessary if additional capacity is required for a faster drawdown or if the pool must be drawn down lower than the lake drain allows. The lake drain is only capable of drawing the pool level down to approximately 10 feet below the principal spillway crest level at a maximum rate of about 2 feet of drawdown per week. Drawdown at a rate more than 1 foot per week could cause sloughing of the embankment's upstream slope or valley walls, but may be required under emergency conditions.
- b. Contact a Professional Engineer for permanent repair recommendations.

2. Leakage/Cracking Condition

- a. Open the lake drain to lower the pool level. Pumps and/or siphons may be necessary if additional capacity is required for a faster drawdown or if the pool must be drawn down lower than the lake drain allows. The lake drain is only capable of drawing the pool level down to approximately 10 feet below the principal spillway crest level at a maximum rate of about 2 feet of drawdown per week. Drawdown at a rate more than 1 foot per week could cause sloughing of the embankment's upstream slope or valley walls, but may be required under emergency conditions.

- b. After the reservoir is fully drained to the appropriate level, contact a Professional Engineer for permanent repair recommendation

3. Sinkhole Condition

- a. Contact contractor to fill sinkhole with earth or rockfill. These materials are available through Mr. Mike Hamper or Ritter Excavating.
- b. Contact a Professional Engineer for permanent repair recommendations.

4. Lake Drain Blockage Condition

- a. Lower the reservoir level using pumps and/or siphons.
- b. Remove blockage from lake drain once water recedes. If the lake drain is structurally damaged, contact a Professional Engineer for permanent repair recommendations.

5. Severe Downstream Erosion or Minor Structural Damage

- a. Monitor and log condition of structures or downstream erosion.
- b. Contact a Professional Engineer for permanent repair recommendations.

C. Emergency Supplies and Resources

Name	Emergency Items	Address	Phone
Independent Local Contractor			
Mike Hamper	Portable Generators, Pumps, Backhoes, Excavators	permagro@embarqmail.com	(440) 813-0776 (Cell) (440) 576-8239 (Home) (440) 576-6216 (Work) (440) 576-6217 (24-hr)
Ritter Excavating			
Mike Ritter	Riprap, Gravel, Fill, Excavator, Generators	3766 Riverdale Road Rock Creek, OH 44084	(440) 563-9354 (Office) (440) 477-6072 (Cell)
Jeff Zindash, Foreman			(440) 812-4062 (Cell) (440) 294-2936 (Home)
Bud K., Foreman			(440) 862-6057 (Cell) (440) 474-6057 (Home)
Matt Hall, Operator			(440) 813-4229

In addition to the above contractors, the Ashtabula County EMA maintains a Resource Manual which contains a list of contractors and available equipment and supplies that can be called on in the event of an emergency. The Ashtabula County EMA can be reached at (440) 576-9148 (or through 911).

VII. INUNDATION MAPS

Appendix A contains a Flood Inundation Mapping Report (May 2007) prepared by Burgess & Niple, Inc. (B&N). The report presents pertinent background information and results of a failure inundation mapping study for the downstream area below Roaming Rock Shores Lake Dam. The study was completed in response to requests by the ODNR concerning Roaming Rock Shores Lake Dam and provides the base data for preparation of this EAP.

The study considers events of an extremely remote nature. The results are not in any way intended to reflect on the integrity of Roaming Rock Shores Lake Dam.

The study analyzed flooding results for five events for the dam – Probable Maximum Flood (PMF) with and without failure of Roaming Rock Shores Lake Dam, and the 25 percent PMF event with and without failure of Roaming Rock Shores Lake Dam and the normal pool event with failure. The breach configuration was determined based on guidelines given in the June 1980 publication, *Flood Emergency Plans – Guidelines for Corps Dams*, by the U.S. Army Corps of Engineers (USACE) Hydrologic Engineering Center. The USACE's Hydrologic Engineering Center - River Analysis System (HEC-RAS) unsteady state model was used to model the five flood events downstream from Roaming Rock Shores Lake Dam.

APPENDIX A
FLOOD INUNDATION MAPPING REPORT

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Probable Maximum Flood Profiles
25 Percent Probable Maximum Flood Profiles
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Appendix

ROAMING ROCK SHORES LAKE DAM FAILURE INUNDATION MAPPING REPORT

INTRODUCTION

This report presents pertinent background information and results of a failure inundation mapping study for the downstream area below Roaming Rock Shores Lake Dam. This study responds to requests by the Ohio Department of Natural Resources (ODNR) concerning Roaming Rock Shores Lake Dam and provides the base data for preparation of an Emergency Action Plan (EAP).

This study considers events of an extremely remote nature. The results are not in any way intended to reflect on the integrity of Roaming Rock Shores Lake Dam.

AUTHORITY FOR STUDY

B&N was authorized by the Village of Roaming Shores on August 11, 2005, to provide flood inundation mapping on Rock Creek and Grand River below the dam for the subsequent preparation of an EAP.

SCOPE OF STUDY

This study analyzed flooding results for six events for each dam – Probable Maximum Flood (PMF) with and without failure of Roaming Rock Shores Lake Dam, and the 25 percent PMF event with and without failure of Roaming Rock Shores Lake Dam and the normal pool event with and without failure. The breach configuration was determined based on guidelines given in the June 1980 publication, *Flood Emergency Plans – Guidelines for Corps Dams*, by the U.S. Army Corps of Engineers (USACE) Hydrologic Engineering Center. The USACE's Hydrologic Engineering Center - River Analysis System (HEC-RAS) unsteady state model was used to model the five events downstream from Roaming Rock Shores Lake Dam.

BASE INFORMATION

A. Data Sources

Previous reports and existing data were utilized in determining the hydrologic and hydraulic features at Roaming Rock Shores Lake Dam. They include:

- 2003 ODNR Dam Inspection Report
- 2001 Ohio Stream Gazetteer
- 1998 ODNR HEC-1 Model
- U.S. Geological Survey (USGS) Topographic Quads 1"=2000'
- 2006 Survey Data from Burgess & Niple, Inc. (B&N)
- 1980 Ashtabula County Flood Insurance Study (FIS)
- Various USGS Stream Gages.

The USGS topographic quads provided the 10-foot contours and stream layout. The contributing stream drainage areas were determined using the Ohio Stream Gazetteer as well as the USGS stream gages. The channel slope and configuration was determined using the survey data from B&N, the USGS topographic quads as well as the Ohio Stream Gazetteer and Ashtabula FIS.

B. Roaming Rock Shores Lake Dam

Roaming Rock Shores Lake is located in Ashtabula County, approximately 0.4 mile upstream of the Village of Rock Creek and controls a drainage area of 73.5 square miles. Water is impounded by a 45-foot-high, 730-foot-long earthfill dam constructed in 1967. The outlet works consists of a principal, auxiliary and emergency spillway, as well as a 36 inch lake drain. The principal spillway is a 180-foot concrete ogee weir with a crest elevation of 850.0, corresponding to 6,091-acre-feet of storage. The auxiliary spillway is a 110-foot concrete ogee spillway located on the right end of the embankment with a crest elevation of 852.0, corresponding to 7,200-acre-feet of storage. The emergency spillway is an 80-foot-wide open channel located to the right of the auxiliary spillway, with a crest elevation of 854.0, and corresponding 8,300-acre-feet of storage. The top of the dam is at 861.0 with a capacity of 120,000-acre-feet of storage. The outflow discharges into Rock Creek and flows 2.4 miles before joining the Grand River.

C. **Flood Inflow Hydrograph**

Roaming Rock Shores Lake Dam is classified as a Class I dam due to the potential downstream hazards and is required to have the PMF as the design flood. The PMF is the flood that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are reasonably possible in the region. A HEC-1 model was reviewed and updated by ODNR in 1998 and included a storm duration of 72-hours with a Probable Maximum Precipitation of 30.8 inches. The model divides the upstream watershed into two sub watersheds and routes the flow to the lake. A review of the 1998 did not find any inaccuracies, so the 1998 model was used for the inflow hydrograph.

D. **Breach Development**

Parameters describing the breach formed in a dam include the final geometry of the breach, the time span from initiation of the breach to complete formation, and the pool elevation at which the failure initiates. The criteria for failing each dam was based on the USACE publication *Flood Emergency Plans, Guidelines for Corps Dams*. For earthen dams, the breach width is to be between 0.5 and 3 times the dam height, the side slope between 0:1 and 1:1, and the time of failure between 0.5 and 4 hours. For this study, a breach width of 45 feet (approximately one dam height), with 1H:1V side slopes and a time to fail of 2 hours were used. The breach outflow produced with this criterion resembled outflows observed from case studies published by the USACE publication *Flood Emergency Plans, Guidelines for Corps Dams* and research done by Froehlich (1995). After conversations with ODNR, the breach width for the PMF and normal pool events was changed to 136 feet (three dam heights). The 25 percent PMF event kept the original failure parameters. For dam failure during a PMF flood event, the reservoir elevation at which failure begins is set at the maximum pool Elevation 859.8 obtained when routing the flood without failure of the dam. The top of dam elevation is 861, so the PMF event does not overtop the dam. For the 25 percent PMF event, failure begins at Elevation 854.5 obtained when routing the flood without failure. For the normal pool event, failure begins at Elevation 850.0 corresponding to the normal pool elevation.

E. **Model Development**

The breach hydrograph, obtained from the HEC-1 output, was routed down Rock Creek and Grand River, using the HEC-RAS unsteady flow model. The downstream cross section geometry was developed using the USGS topographic quadrangles (10-foot contours) and the B&N survey data. Survey sections were taken at a total of 12 locations on Rock Creek and Grand River. Three cross sections were

surveyed on Rock Creek at the Route 45 Bridge, near Richmond-Footville Road and just downstream of the dam. Nine cross sections were surveyed on the Grand River at the following locations; Callender Road, Shaffer Road, Footville-Richmond Road, Riverdale Road, Latimer Road, Sweitzer Road, Cork Cold Springs Road, Winsor-Mechanicsville Road, and Route 534 near Harpersfield. The surveyed cross sections and USGS topographic quads were combined to give the best representation of the channel and overbank geometry. The channel slope of the river was developed from the surveyed cross sections, the Ashtabula County FIS (only available between Sweitzer Road and Mechanicsville) and the Ohio Stream Gazetteer, which lists the streambed elevation at all confluences. The three data sources were compared to come up with the most representative channel slope. Additional cross sections were cut based on the USGS quads geometry and interpolated surveyed channel geometry. A total of 59 cross sections were developed to best represent the two rivers in the model. The model extends 2.4 miles down Rock Creek to the confluence with Grand River. The model continues 20 miles down the Grand River and terminates at the Village of Harpersfield.

During a PMF event, rainfall would be falling, not only on the drainage area to Roaming Rock Shores Lake Dam, but also on the contributing drainage area downstream. This contributing runoff was accounted for in the model. On the Grand River, between the confluence of Rock Creek and the Village of Harpersfield, there is 263 square miles of drainage area in the form of 5 tributaries and nonpoint source runoff. The distribution is as follows:

Grand River Tributary	Contributing Area	
	Tributary (sq mi)	Nonpoint Source (sq mi)
Rock Creek	71	2
Three Brothers Creek	19	2
Trumbull Creek	22	13
Mill Creek	103	2
Center Creek	8	0
Coffee Creek	12	9
Harpersfield (End of Study)		

It is assumed that the downstream drainage area would be experiencing the same storm event that Roaming Rock Shores Lake is. To determine contributing flow for the nonpoint source drainage area and all tributaries except Mill Creek, the 24-hour average inflow (peak at hour 12) to Roaming Rock Shores Lake for the given event was used and divided by the drainage area upstream of the lake (69.9 square miles). This gives a natural discharge per square mile. This factor was multiplied by the contributing drainage area to determine the total flow for each tributary and nonpoint source flow. Due to the size of its contributing drainage area, the contributing flow from Mill Creek could not be done in this fashion. To determine the flow from Mill Creek during a particular event on Rock Creek, a correlation curve was developed using the USGS stream gage on Mill Creek near Jefferson and Rock Creek near Rock Creek based on the 24-hour daily flow for the concurrent period of record of 1942-1966. An equation was developed for the concurrent period of record relating flow on Rock Creek to flow on Mill Creek. This equation was used to determine the contributing flow for Mill Creek based on the flood event on Rock Creek. The contributing flow was entered in the HEC-RAS model as a constant Lateral Flow for the tributaries and Uniform Flow for the nonpoint source.

The Grand River upstream of the confluence with Rock Creek has a drainage area of 289 square miles. Therefore, it is not a valid assumption to think that the Grand River would be experiencing the same event that Rock Creek and its tributaries are. For our analysis, we assumed that during the PMF and 25 percent PMF event, Grand River would be experiencing the 100-year event. The 100-year flow was based on the Ashtabula FIS, which covers the area between Sweitzer Road and Mechanicsville. Despite the limited reach of the FIS, the 100-year flow at Sweitzer Road was used as the initial flow condition on the Grand River. During a normal pool event, it is assumed that the Grand River and its tributaries would all be experiencing the same event (normal conditions).

Due to the lack of inflow into Roaming Rock Shores Lake Dam during the Normal Pool event, the initial flow in the Grand River and the contributing flow from the downstream area had to be developed an alternate way. To develop the initial flow in the Grand River, the existing USGS stream gages were evaluated to determine an average flow. Only two gages in the vicinity of the dam had any period of record. They were the Grand River near Madison, Ohio (1922-1974) located downstream of Harpersfield with a drainage area of 581 square miles and the Grand River near Rome, Ohio (1942-1947) located upstream of the confluence with Rock Creek with a drainage area 281 square miles. A correlation curve for the Grand River near Madison to the Grand River near Rome was developed based on the concurrent period of record (1942-1947). The average flow based on the Grand River near Madison gage's period of record (1922-1974) was correlated to the Rome gage. The initial flow on the Grand

River just upstream of Rock Creek was obtained by interpolating between the Rome gage value and the Madison gage value. The difference in the average flow between the initial flow value upstream of Rock Creek and the average flow at the Madison gage would be the contributing flow by the tributaries and nonpoint sources and was distributed based on drainage areas. However, to stabilize the model during the normal pool failure scenario, an initial flow value of 1,500 cubic feet per second (cfs) on the Grand River was ultimately used.

F. Modeling Conditions

The HEC-1 model obtained from ODNR was used to produce the dam failure hydrographs for Roaming Rock Shores Lake Dam. The resulting failure hydrograph from HEC-1 was inserted into a HEC-RAS unsteady state flow model. This model then routed the hydrograph down Rock Creek 2.4 miles to the confluence of Grand River and then downstream 20 miles to Harpersfield. For the PMF nonfailure event, the dam is not overtopped and the principal, auxillary, and emergency spillway convey flow downstream. For the 25 percent PMF nonfailure event, all three spillways still convey flow downstream but there is only 0.5 feet of flow in the emergency spillway. During the normal pool event, minimal flow is conveyed downstream to stabilize the model. Resulting peak discharges for the PMF, 25 percent PMF, and normal pool models are as follows:

<u>Location</u>	<u>PMF Peak Discharges</u>	
	<u>w/failure</u>	<u>w/o failure</u>
Roaming Rock Shores Lake Dam	117,800 cfs	45,360 cfs
Grand River (Upstream Limit)	8,560 cfs	8,560 cfs
Grand River downstream of Confluence	71,000 cfs	50,390 cfs
Study Limit (Harpersfield)	100,185 cfs	90,780 cfs

<u>Location</u>	<u>25% PMF Peak Discharges</u>	
	<u>w/failure</u>	<u>w/o failure</u>
Roaming Rock Shores Lake Dam	53,700 cfs	10,710 cfs
Grand River (Upstream Limit)	8,560 cfs	8,560 cfs
Grand River downstream of Confluence	48,570 cfs	18,930 cfs
Study Limit (Harpersfield)	37,860 cfs	29,000 cfs

<u>Location</u>	<u>Normal Pool Peak Discharges</u>	
	<u>w/failure</u>	<u>w/o failure</u>
Roaming Rock Shores Lake Dam	56,100 cfs	80 cfs
Grand River (Upstream Limit)	1,500 cfs	1,500 cfs
Grand River downstream of Confluence	25,400 cfs	1,580 cfs
Study Limit (Harpersfield)	7,100 cfs	1,829 cfs

G. Bridges and Downstream Dams

Numerous roads cross Rock Creek and Grand River in the vicinity of the dam failure flood, including State Route 45, Shaffer Road, Footville-Richmond Road, Seitzer Road, Cork Cold Springs Road, and Windsor-Mechanicsville Road. None of the downstream bridges had significant embankment height in respect to the events being analyzed and were not included in the downstream model.

Armington Lake Dam is located just off-stream of the Grand River at Mechanicsville, approximately 17 miles downstream from Roaming Rock Shores Lake Dam. It is an earthen dam, 29 feet high and 250 feet long, with a total volume of 18,200 acre feet. During the PMF event, the dam failure flood from Roaming Rock Shores Lake Dam would have dissipated by the time it reached Mechanicsville, so the possibility of failure of the Armington Lake Dam during the PMF event was not taken into consideration in the model.

STUDY RESULTS

A. Flood Profiles

A plot of the streambed and all modeled flood event profiles is included. The flood events were routed downstream until the water surface elevation difference between the dam failure event and nonfailure event was approximately 2 feet or less or was confined within the banks of the Grand River. All three events met this criterion by the time the flood events reached Harpersfield.

B. Probable Maximum Flood without Failure

Flooding for this condition is smaller than that of the PMF with failure because of the dam's reservoir storage volume relative to its drainage area. The extent of flooding for this event is not indicated on the flood inundation maps to more clearly show the maximum flooding extent.

C. Probable Maximum Flood with Failure

This analysis routes the failure of Roaming Rock Shores Lake Dam occurring when the pool has reached its maximum nonfailure elevation of 859.8 during the PMF Event. The peak failure flow changes from 117,800 cfs at the dam to 100,185 cfs at Harpersfield. The lack of dissipation of flow is due to the numerous tributaries and drainage area experiencing the PMF and contributing to the Grand River. The flood stages on Rock Creek during this event range from 17.2 feet above the nonfailure event at the dam to 1.8 feet above the nonfailure event at the confluence with the Grand River. The flood stage at Harpersfield is 1.3 feet above the nonfailure stage. For the PMF event, the dam failure flood wave was within two feet of the nonfailure flood stage at the confluence of Rock Creek and the Grand River. However, this event was shown mapped to Harpersfield to be consistent with the other events.

D. 25 Percent Probable Maximum Flood with Failure

The 25 percent PMF event with failure occurs when the pool has reached its maximum nonfailure elevation of 854.5. The maximum elevation for this event still provides flow through the principal, emergency and auxiliary spillways. The peak dam failure flow diminishes from 53,700 cfs at the dam to 37,860 cfs at Harpersfield. The dam failure flood stages are approximately half way between the failure stages for the PMF and Normal Pool events. This event is not shown on the flood inundation map.

E. Normal Pool Event with Failure

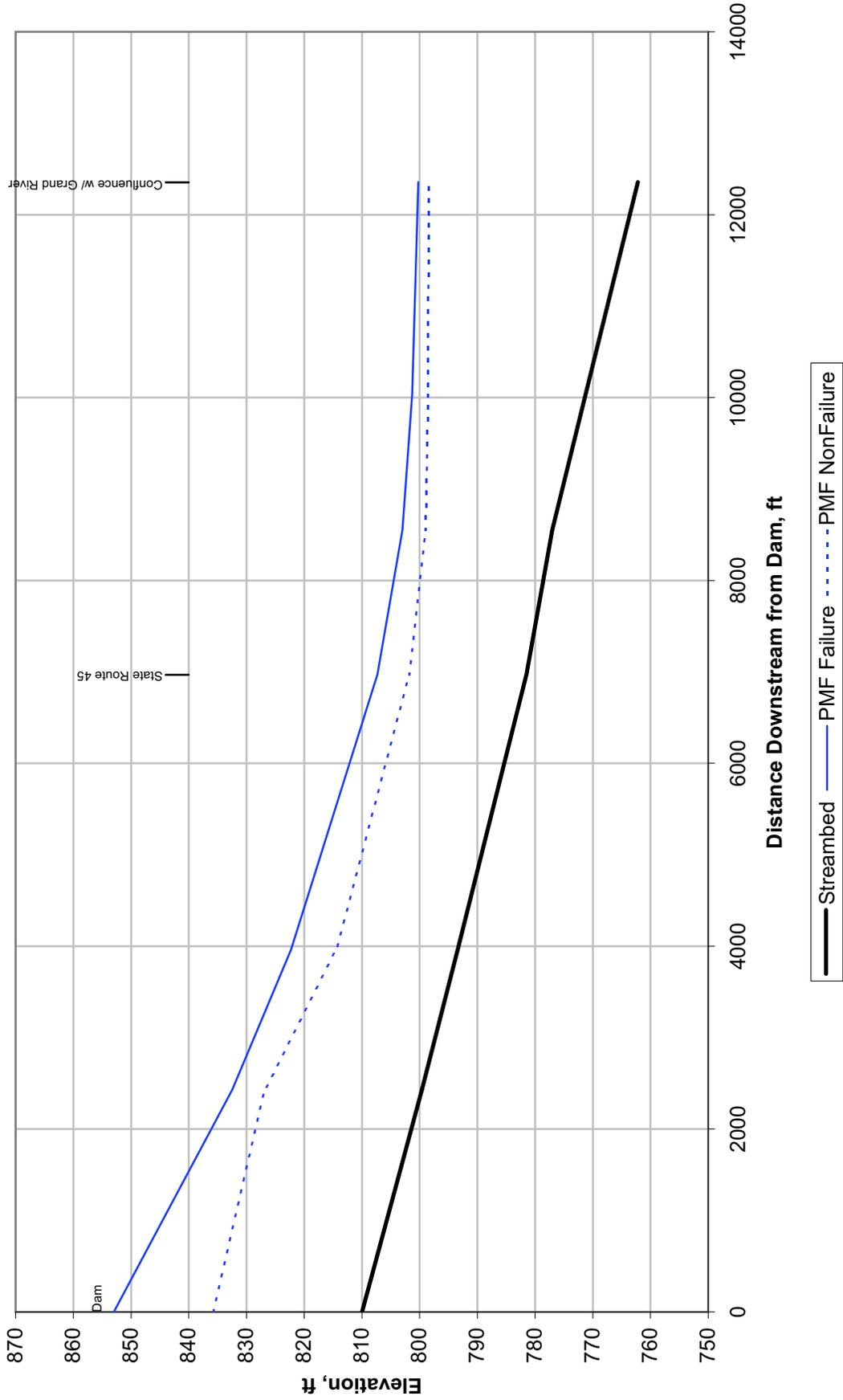
The normal pool failure occurs while the pool is at 850.0, or normal pool. At this elevation, flows through the principal, emergency, and auxiliary spillways are nonexistent. A base flow is added in the model for stabilization. The peak failure flow reduces from 56,100 cfs at the dam to 7,100 cfs at Harpersfield, by virtue of the valley storage on the Grand River. The flood stages on Rock Creek during this event range from 27.6 feet above the nonfailure event at the dam to 13 feet above the nonfailure event at the confluence with the Grand River. The flood stage at Harpersfield is 5.5 feet above the nonfailure stage. However, the flood stage at Harpersfield is within the banks of the Grand River and does not pose a threat. This event is shown on the flood inundation map.

F. Mapping Flood Information

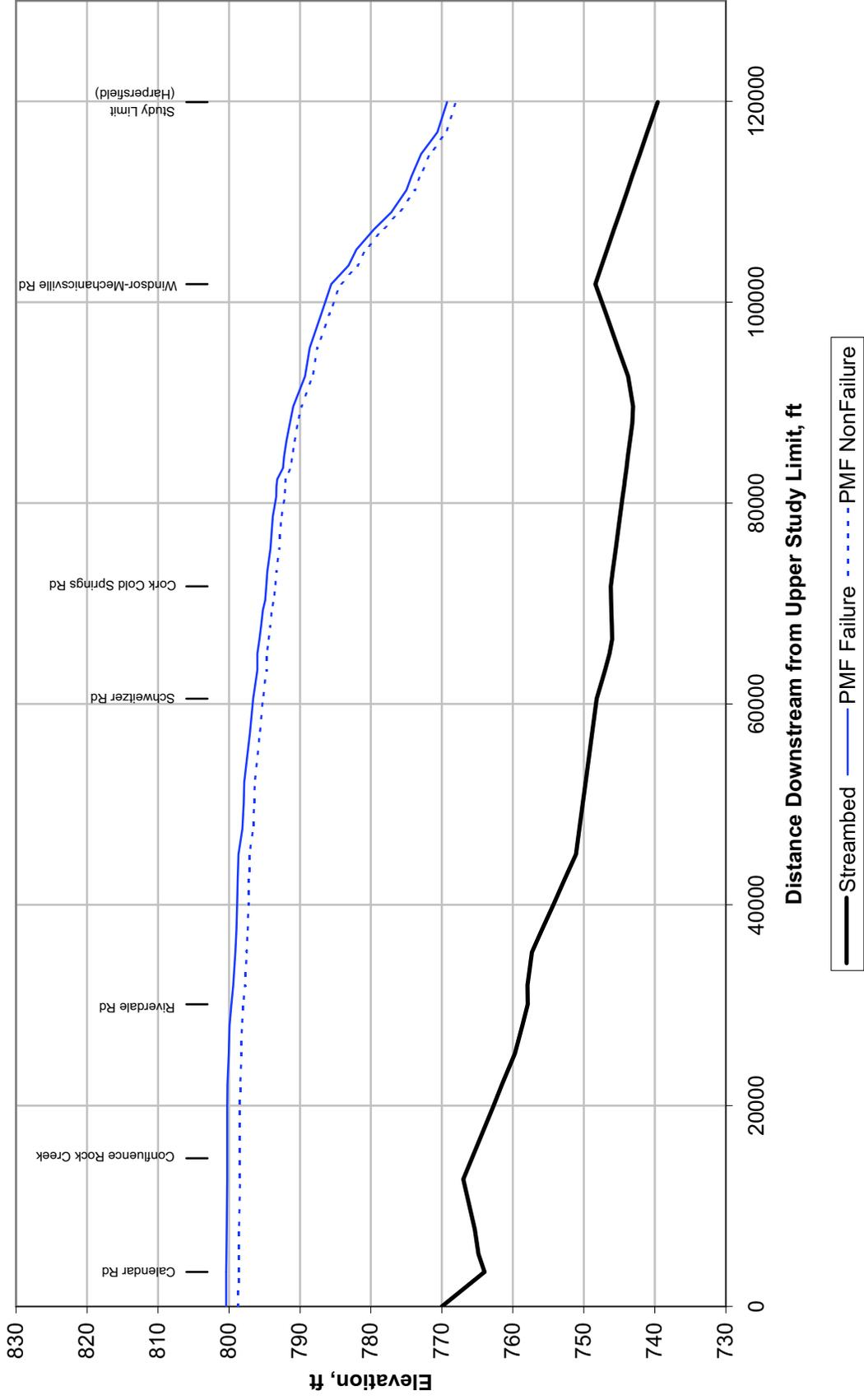
PMF and normal pool flood information is provided at selected cross sections on the inundation maps. Definitions of the peak time and peak elevation are listed in the legend. Elapsed time for the PMF is measured from the time when Roaming Rock Shores Lake Dam reaches 859.8, the beginning of dam failure. Elapsed time for the normal pool failure is measured from the time at which Roaming Rock Shores Lake Dam exceeds 850.0, beginning of dam failure. Results are based on an assumed total failure time of 2 hours. The cross sections are numbered as miles upstream of the study limit on the Grand River and miles upstream from the confluence with the Grand River for Rock Creek.

PROBABLE MAXIMUM FLOOD PROFILES

Roaming Rock Shores Lake Dam Rock Creek PMF Profile

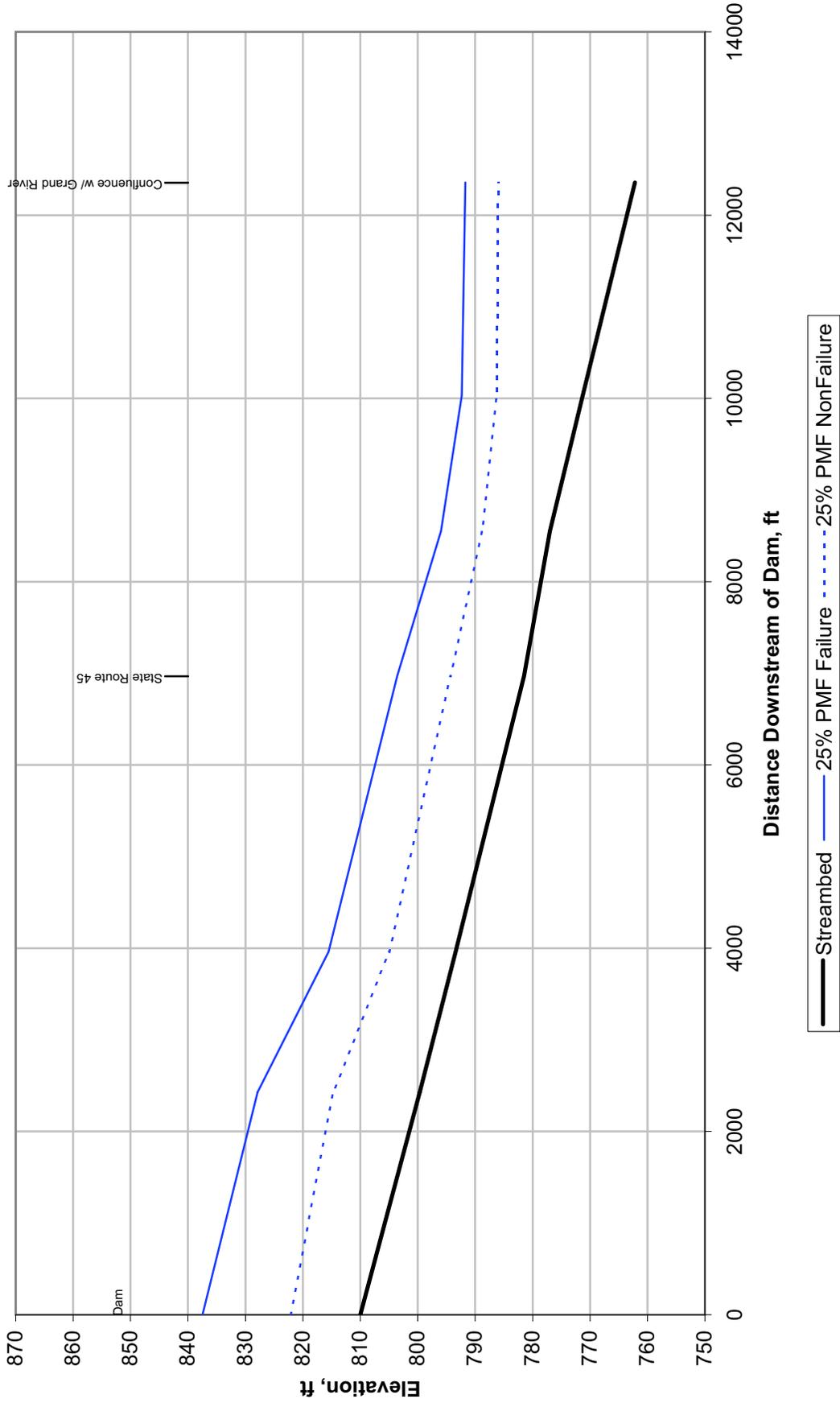


Roaming Rock Shores Lake Dam Grand River PMF Profile

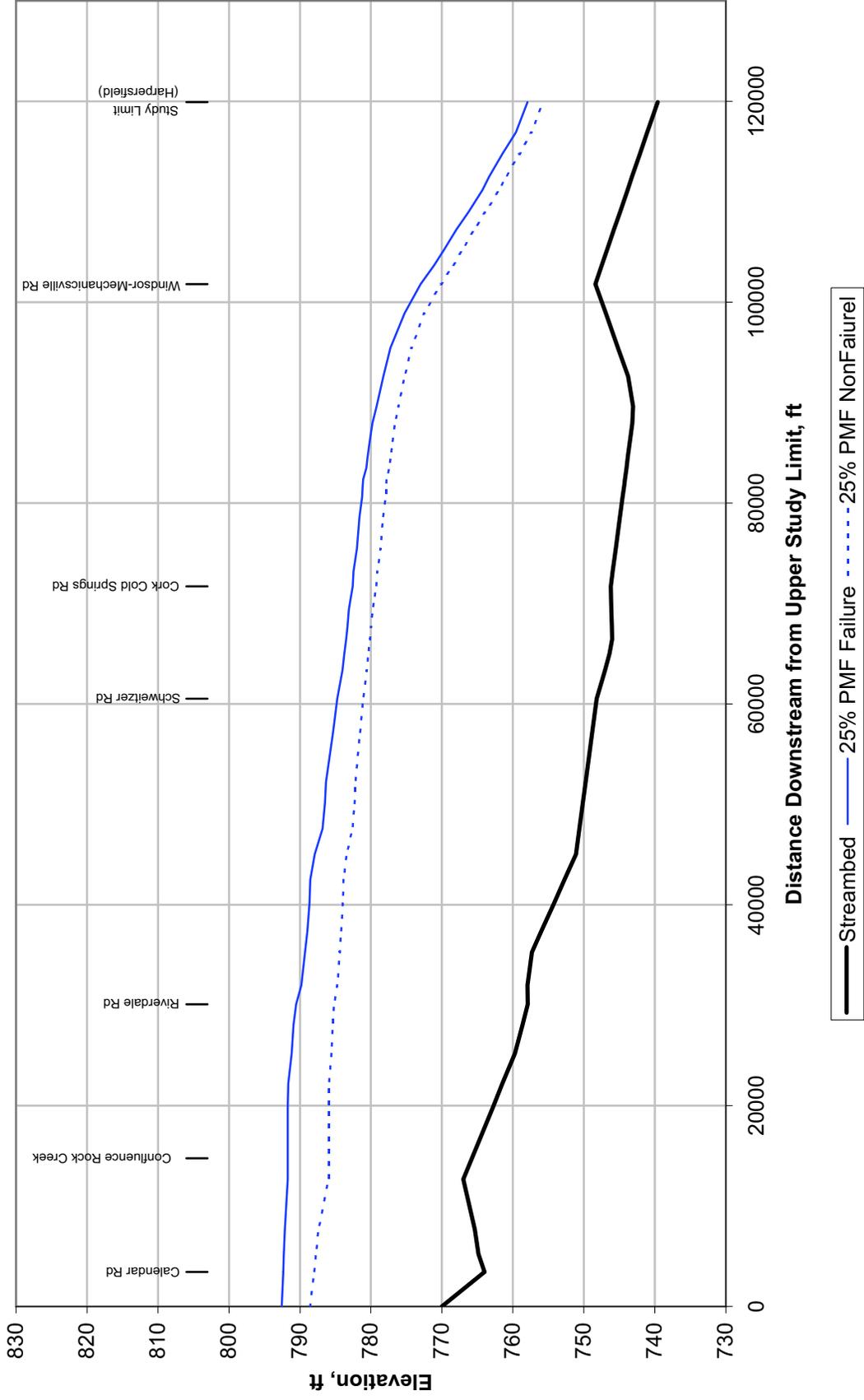


25 PERCENT PROBABLE MAXIMUM FLOOD PROFILES

Roaming Rock Shores Lake Dam Rock Creek 25% PMF Profile

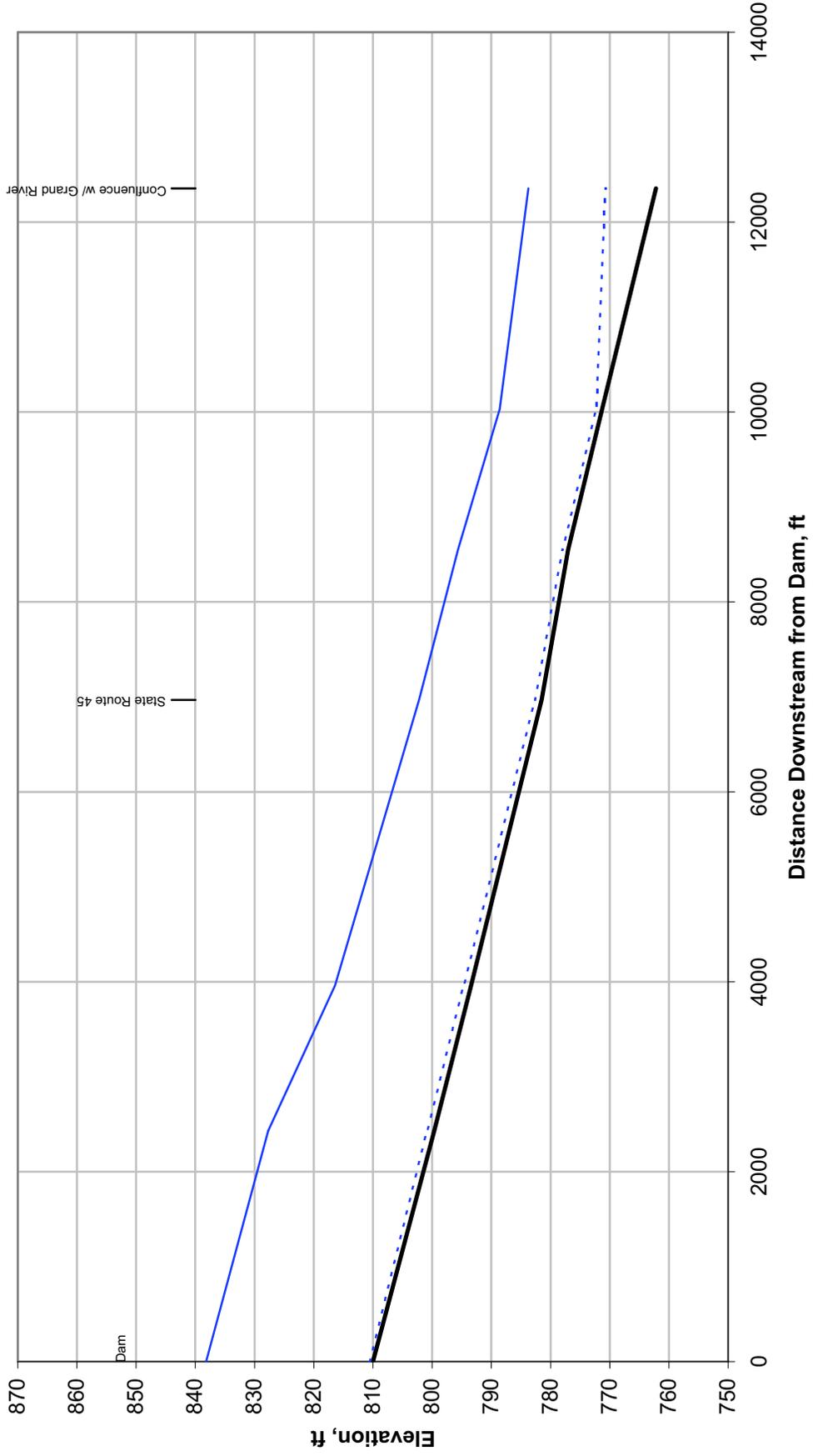


Roaming Rock Shores Lake Dam Grand River 25% PMF Profile

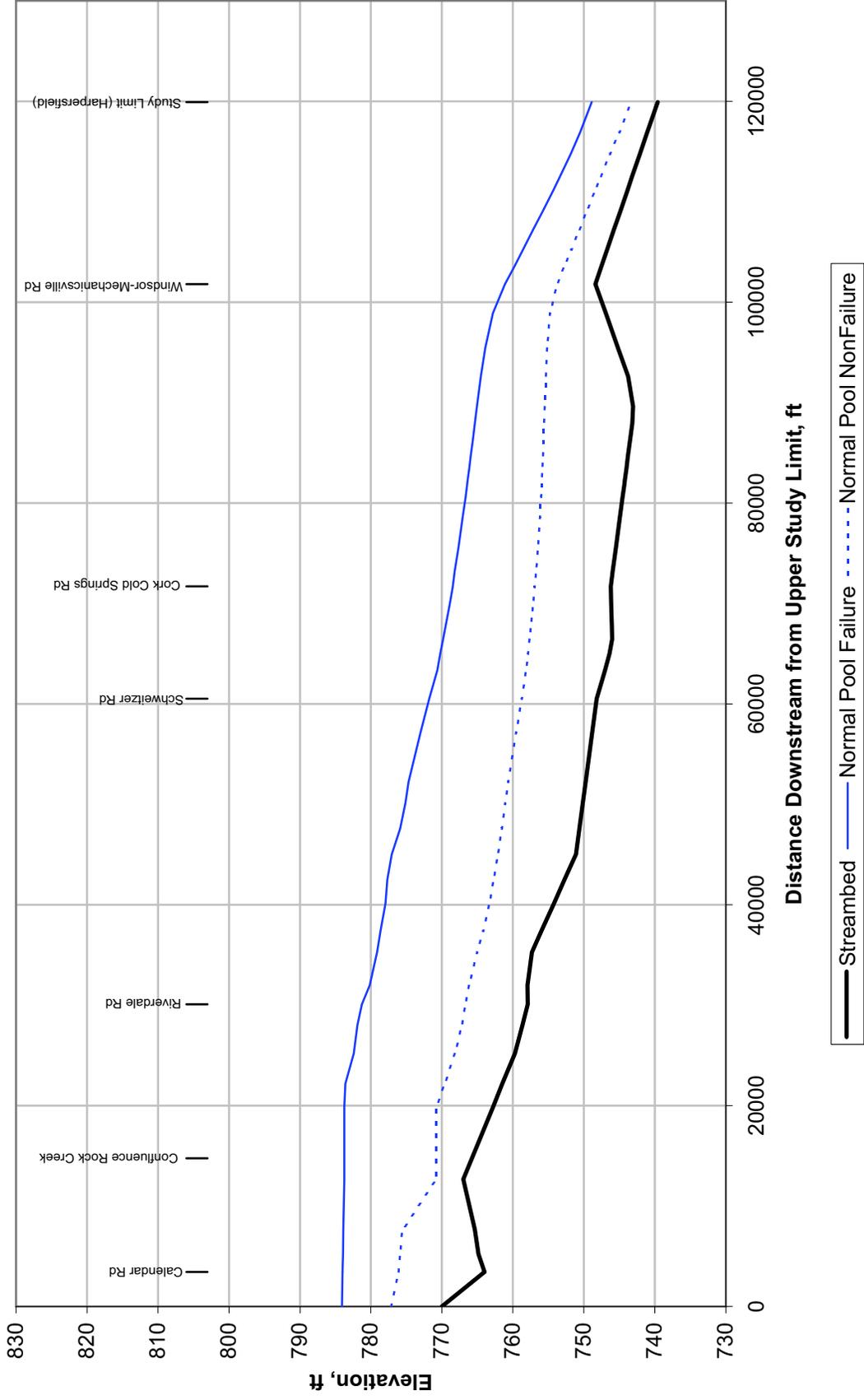


NORMAL POOL PROFILES

Roaming Rock Shores Lake Dam Rock Creek Normal Pool Profile

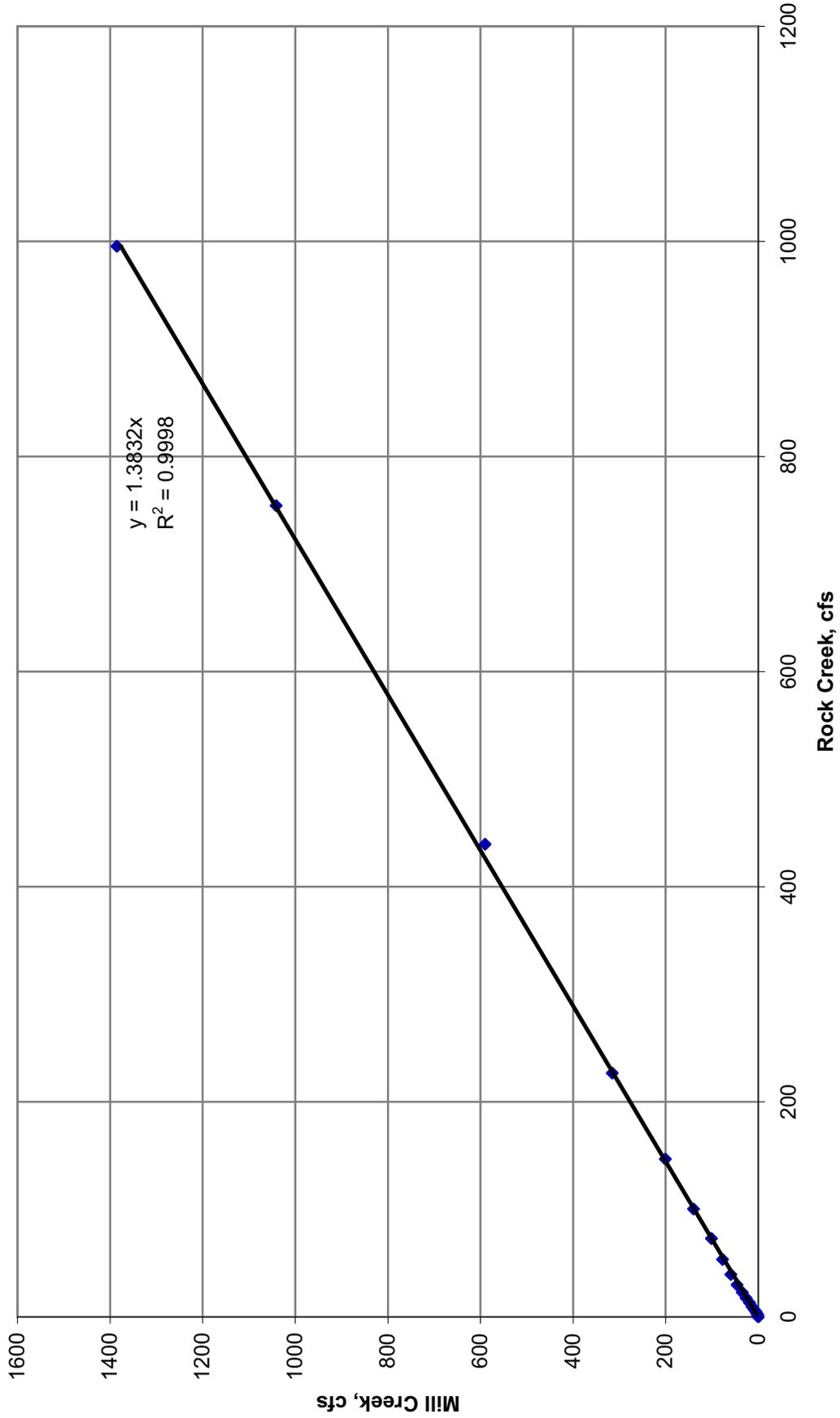


Roaming Rock Shores Lake Dam Grand River Normal Pool Profile

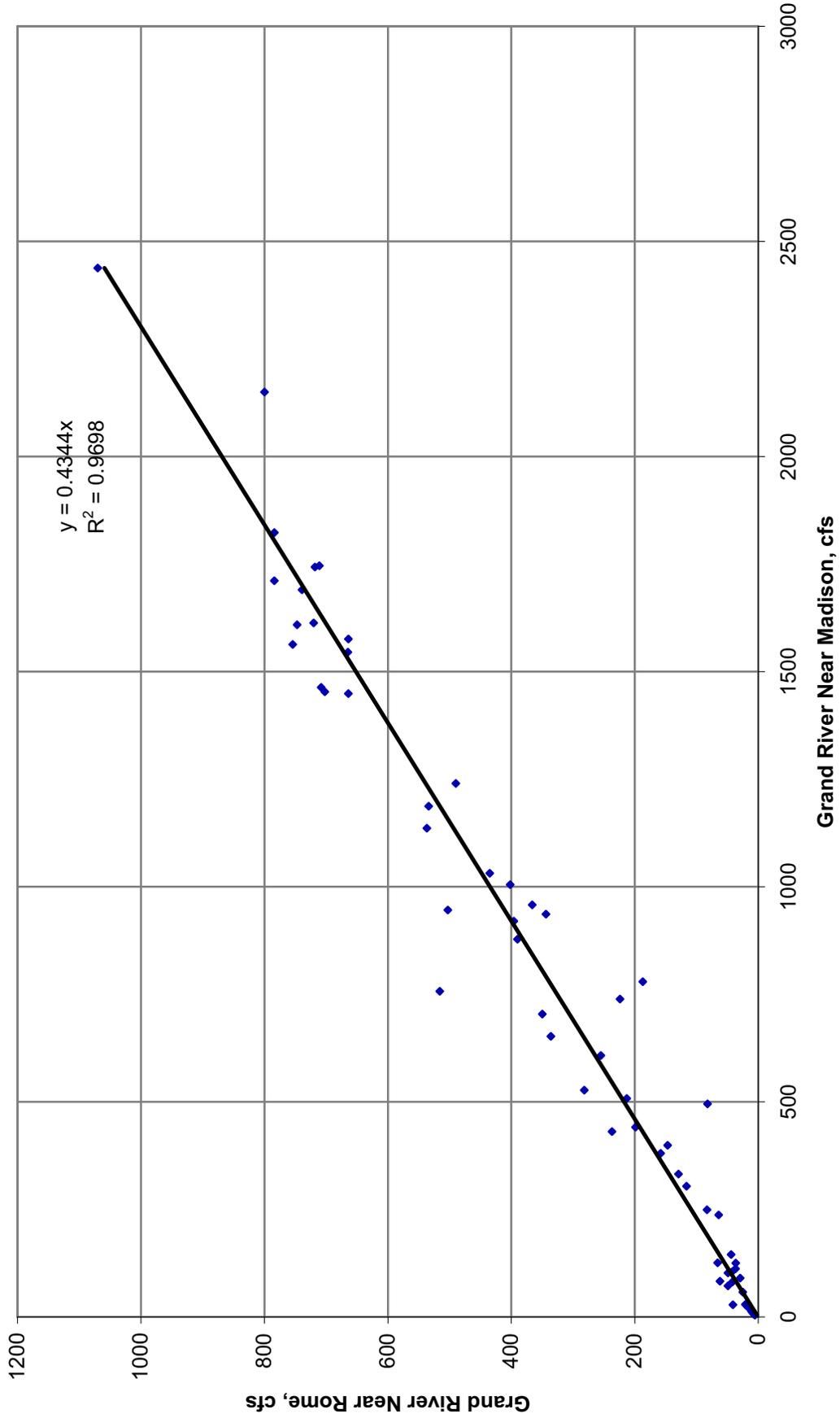


APPENDIX

Rock Creek vs. Mill Creek 1942-1966



Roaming Rock Shores Lake Dam Grand River Correlation 1942-1947



MATCH TO SHEET 3 OF 6



MATCH TO SHEET 2 OF 6

2000 FLOOD CONTROL DISTRICT	628 FT. (194M)	628 FT. (194M)	628 FT. (194M)
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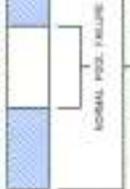
LOCATION MAP

SCALE: 1" = 1 MILE

DEFINITIONS

THIS MAP - SHOWS THE AREA TO BE FLOODED IN THE EVENT OF A DAM BREACH. THE FLOODING IS BASED ON THE PROBABLY MOST UNFAVORABLE CONDITIONS OF A BREACH OF THE DAM. THE FLOODING IS BASED ON THE PROBABLY MOST UNFAVORABLE CONDITIONS OF A BREACH OF THE DAM. THE FLOODING IS BASED ON THE PROBABLY MOST UNFAVORABLE CONDITIONS OF A BREACH OF THE DAM.

LEGEND FOR FLOODING LIMITS



PROBABLE MAXIMUM FLOOD WITH DAM FAILURE

CROSS SECTION

1. NORMAL POND FLOODING WITH DAM FAILURE
2. PROBABLE MAXIMUM FLOOD WITH DAM FAILURE

NOT INDICATED AREAS ARE NOT TO BE FLOODED

DATE: 10/15/03

BY: [Redacted]

SCALE: 1" = 1 MILE

PROJECT NO. 03-001

DAM FAILURE ANALYSIS INUNDATION MAP

VILLAGE OF ROAMING SHORES ROAMING ROCK SHORES LAKE DAM

BURGESS & NIPLE

Burgess & Niple, Inc. COLLINGSWOOD, OHIO

DATE	10/15/03
BY	[Redacted]
SCALE	1" = 1 MILE
PROJECT NO.	03-001

DATE	10/15/03
BY	[Redacted]
SCALE	1" = 1 MILE
PROJECT NO.	03-001

DATE	10/15/03
BY	[Redacted]
SCALE	1" = 1 MILE
PROJECT NO.	03-001

DATE	10/15/03
BY	[Redacted]
SCALE	1" = 1 MILE
PROJECT NO.	03-001

DATE	10/15/03
BY	[Redacted]
SCALE	1" = 1 MILE
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BY	[Redacted]
SCALE	1" = 1 MILE
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PROJECT NO.	03-001

DATE	10/15/03
BY	[Redacted]
SCALE	1" = 1 MILE
PROJECT NO.	03-001

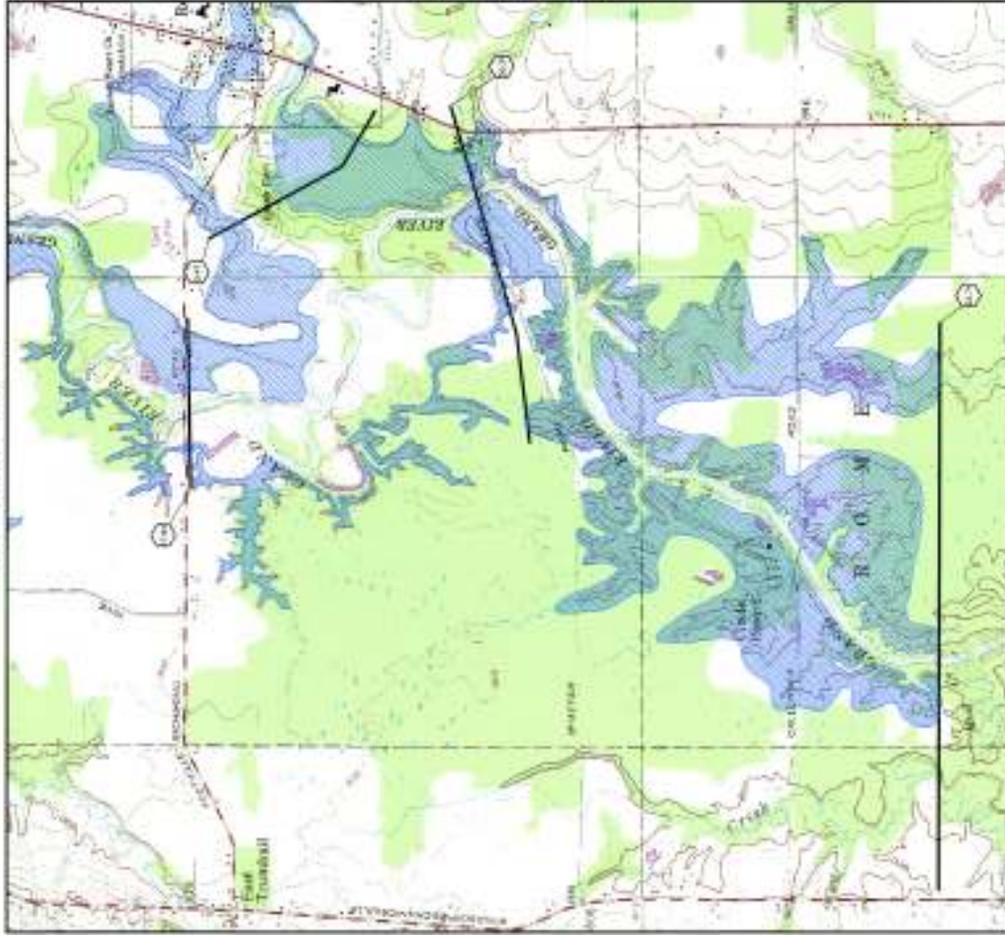
DATE	10/15/03
BY	[Redacted]
SCALE	1" = 1 MILE
PROJECT NO.	03-001

DATE	10/15/03
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SCALE	1" = 1 MILE
PROJECT NO.	03-001

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SCALE	1" = 1 MILE
PROJECT NO.	03-001

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BY	[Redacted]
SCALE	1" = 1 MILE
PROJECT NO.	03-001

MATCH TO SHEET 3 OF 5



MATCH TO SHEET 1 OF 5



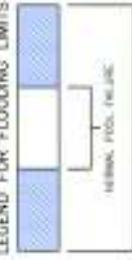
LOCATION MAP

SCALE: 1" = 1 MI.

DEFINITIONS

THE MAP IS A TECHNICAL DRAWING OF THE PROJECT AREA FOR THE PURPOSE OF ILLUSTRATING THE LOCATION OF THE DAM AND THE FLOODING LIMITS. IT IS NOT A SURVEY MAP AND DOES NOT SHOW PROPERTY LINES OR ADJACENT LANDS. THE LOCATION OF THE DAM AND THE FLOODING LIMITS ARE BASED ON THE DATA PROVIDED BY THE CLIENT. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE DATA PROVIDED. THE ENGINEER HAS CONDUCTED VISUAL INSPECTIONS OF THE DAM AND THE FLOODING LIMITS AND HAS FOUND THEM TO BE IN ACCORDANCE WITH THE DATA PROVIDED. THE ENGINEER HAS CONDUCTED VISUAL INSPECTIONS OF THE DAM AND THE FLOODING LIMITS AND HAS FOUND THEM TO BE IN ACCORDANCE WITH THE DATA PROVIDED.

LEGEND FOR FLOODING LIMITS



POSSIBLE MAXIMUM FLOOD WITH DAM FAILURE

ONDS SECTION

CONCRETE DAM, 100% DESIGN, 100% DESIGN OF 100%

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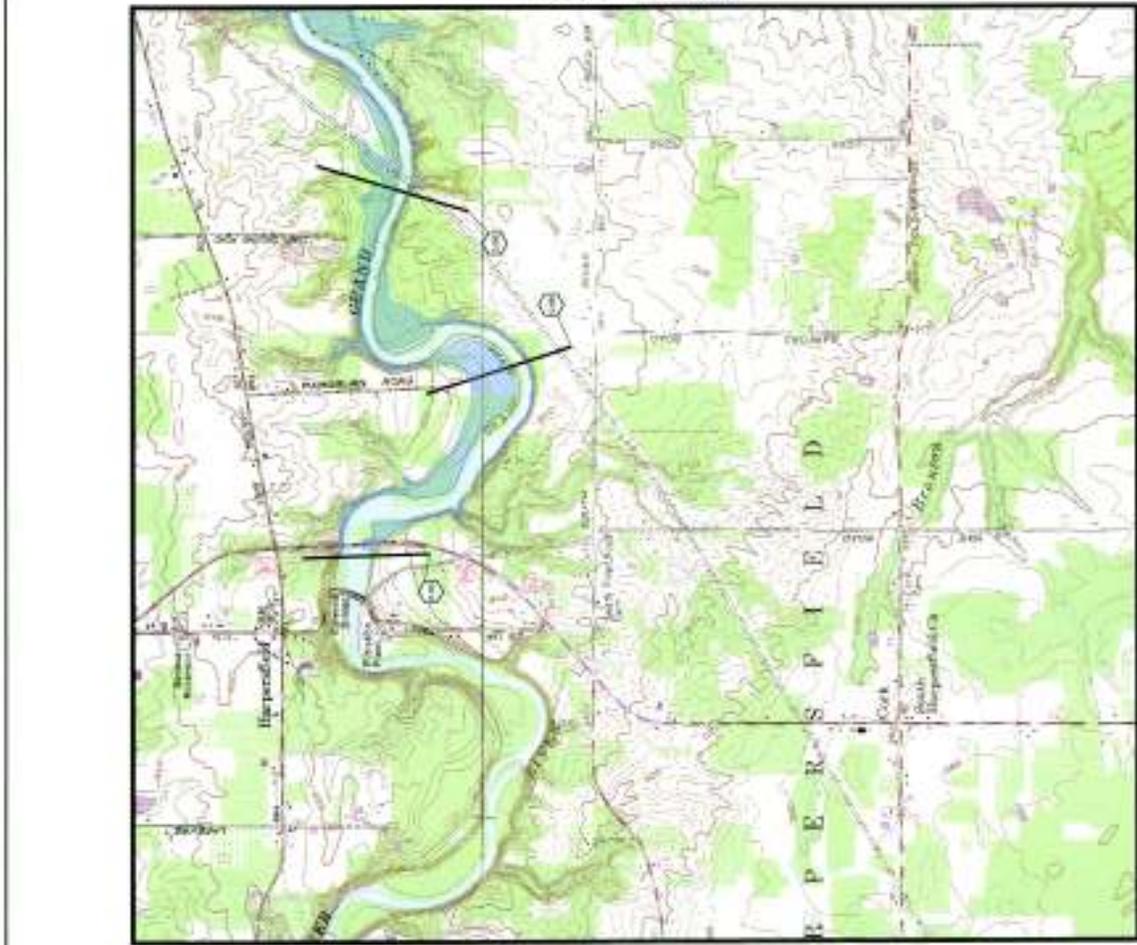
DATE	BY	CHKD	APP'D



**VILLAGE OF ROAMING SHORES
ROAMING ROCK SHORES LAKE DAM**

**DAM FAILURE ANALYSIS
INUNDATION MAP**

NO. OF SHEETS	5
SHEET NO.	2
DATE	10/2024



DATE: 08/14/2013 10:52:11 AM	PROJECT: VILLAGE OF ROAMING SHORES ROAMING ROCK SHORES LAKE DAM
FILE: 081413.dwg	USER: J. BURNESS
PLT: 081413.plt	SCALE: 1" = 100'
NAME: J. BURNESS	DATE: 08/14/2013

DATE: 08/14/2013 10:52:11 AM	PROJECT: VILLAGE OF ROAMING SHORES ROAMING ROCK SHORES LAKE DAM
FILE: 081413.dwg	USER: J. BURNESS
PLT: 081413.plt	SCALE: 1" = 100'
NAME: J. BURNESS	DATE: 08/14/2013

DATE: 08/14/2013 10:52:11 AM	PROJECT: VILLAGE OF ROAMING SHORES ROAMING ROCK SHORES LAKE DAM
FILE: 081413.dwg	USER: J. BURNESS
PLT: 081413.plt	SCALE: 1" = 100'
NAME: J. BURNESS	DATE: 08/14/2013



LOCATION MAP

SCALE: 1" = 1 MILE

DEFINITIONS

FROM THE: DAM FAILURE ANALYSIS FOR THE ROAMING ROCK SHORES LAKE DAM

FROM THE: DAM FAILURE ANALYSIS FOR THE ROAMING ROCK SHORES LAKE DAM

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LEGEND FOR FLOODING LIMITS



POSSIBLE MAXIMUM FLOOD WITH DAM FAILURE

DAM FAILURE POOL FAILURE

DAM FAILURE ANALYSIS FOUNDATION MAP

VILLAGE OF ROAMING SHORES ROAMING ROCK SHORES LAKE DAM

BURGESS & NIPLE

DATE: 08/14/2013 10:52:11 AM	PROJECT: VILLAGE OF ROAMING SHORES ROAMING ROCK SHORES LAKE DAM
FILE: 081413.dwg	USER: J. BURNESS
PLT: 081413.plt	SCALE: 1" = 100'
NAME: J. BURNESS	DATE: 08/14/2013

DATE: 08/14/2013 10:52:11 AM	PROJECT: VILLAGE OF ROAMING SHORES ROAMING ROCK SHORES LAKE DAM
FILE: 081413.dwg	USER: J. BURNESS
PLT: 081413.plt	SCALE: 1" = 100'
NAME: J. BURNESS	DATE: 08/14/2013

APPENDIX B
TRAINING, EXERCISING, UPDATING, AND POSTING THE EAP

A. **Training**

The Roaming Rock Shores Lake Dam Village Administrator and Zoning/Building Inspector shall both be thoroughly familiar with the Emergency Action Plan (EAP) and the actions that may be required under the EAP.

The Village Administrator shall be responsible for training alternate Village staff to complete the Zoning/Building Inspector's duties in the event the Zoning/Building Inspector is not available during a period of emergency as described in this EAP. The Village Administrator shall also be familiar with those duties and able to carry them out.

In addition, the Zoning/Building Inspector shall be responsible for training dam maintenance staff and other Village staff in the actions and responses that they may be called upon to complete in the event of an emergency at the dam.

B. **Exercising**

The Zoning/Building Inspector shall plan and convene an emergency exercise one time each year. The exercise shall include appropriate Village administrative and maintenance personnel. Response organizations shall be invited to participate, however, their unavailability shall not be cause for canceling the exercise. The exercise shall be performed to test the procedures and determine appropriate actions in the event of an emergency.

At the conclusion of the exercise, the personnel shall review the exercise and prepare a written summary of lessons learned and items that can be improved upon.

C. **Updating the EAP**

The Village Administrator shall be responsible for keeping the EAP up-to-date. The Village Administrator shall review the EAP at least annually for changes that may have taken place such as:

- Names of Village staff specifically called out in the EAP
- Name of the County Sheriff
- Alterations to the dam
- Additions or deletions to the list of Emergency Supplies and Resources

- Changed telephone numbers.

In addition, the EAP shall be updated if it is found to require modification as a result of an actual emergency situation.

Upon completion of each annual review, the Village Administrator shall complete the form on the following page to document the review and update.

Every five years the Village shall retain a Professional Engineer to review the EAP to assure that it remains viable in the event that an emergency should occur at the dam. At a minimum, the Professional Engineer's activities should include:

- A site visit to inspect the dam and appurtenances and to review staffing and emergency responses by Village personnel
- Review of the written plan
- Confirm that Emergency Supplies and Resources are current.
- Complete any necessary updates to the EAP and submit it to the Village.

D. Posting the EAP

The Village Administrator shall be responsible for maintaining one copy of the EAP at Village offices and for distribution of one copy of the final EAP, as approved by the Ohio Department of Natural Resources (ODNR), to each of the following organizations:

- ODNR
- Ashtabula County Sheriff
- Ashtabula County Emergency Management Agency
- Village of Roaming Shores
- Village of Rock Creek, Morgan Hose Company
- Harpers Field Township Fire Department
- Trumbull Township Fire Department
- Rome Township Fire Department
- South Central Ambulance District (SCAD)
- Northwest Ambulance District (NAD)
- Burgess & Niple, Inc. (B&N).

In addition to the above distribution of the EAP, the Notification Flowchart shall be posted in a public location in the Village offices.

**ROAMING ROCK SHORES LAKE DAM
EMERGENCY ACTION PLAN
PLAN REVIEW AND UPDATE RECORD**

The EAP must be reviewed and updated (if necessary) annually for accuracy of information provided, particularly to keep contact names and telephone numbers up-to-date. At the conclusion of each review and update the changes shall be indicated in the following table.

Date Review Completed	Name and Title of Reviewer	Changes Made

If changes to contact information are made, copies of the revised sheets shall be provided to all holders of copies of the EAP.

APPENDIX C
PREPARATION AND APPROVAL OF THE EAP

A. Plan Preparation

This Emergency Action Plan (EAP) was prepared by Burgess & Niple, Inc., (B&N) Columbus, Ohio for the Roaming Rock Shores Lake Dam. The EAP was prepared based on observations made during site visits, information provided by the Village, information obtained from Ohio Department of Natural Resources (ODNR) inspection reports, and modeling of flooding conditions as prepared by B&N. The EAP was prepared to meet the requirements of the ODNR for an EAP as provided in Ohio Administrative Code (OAC) 1501:21-15-07 and 1501:21-21-04 and as further detailed in ODNR's EAP Guidelines.

B. Owner's Review

This Emergency Action Plan was prepared for the Roaming Rock Shores Lake Dam under my direction as the Fire Safety Officer. By signing this Approval, I certify that I have read and understand the Emergency Action Plan and the actions that may be required under it, and the information contained herein is accurate as of the date of my signature.

(Signature)

(Date)

Chip Laugen
Fire Safety Officer

C. ODNR Approval

This EAP shall be submitted to the ODNR for review and approval. Upon receipt of written approval from the ODNR, a copy of ODNR's approval letter shall be attached in this EAP following this page and a copy of the approval letter shall be forwarded to each holder of a copy of the EAP.