



# Beaver Creek No. 1 Supplemental Watershed Plan – Environmental Assessment - Initial Public Presentation



## Project Team in Attendance

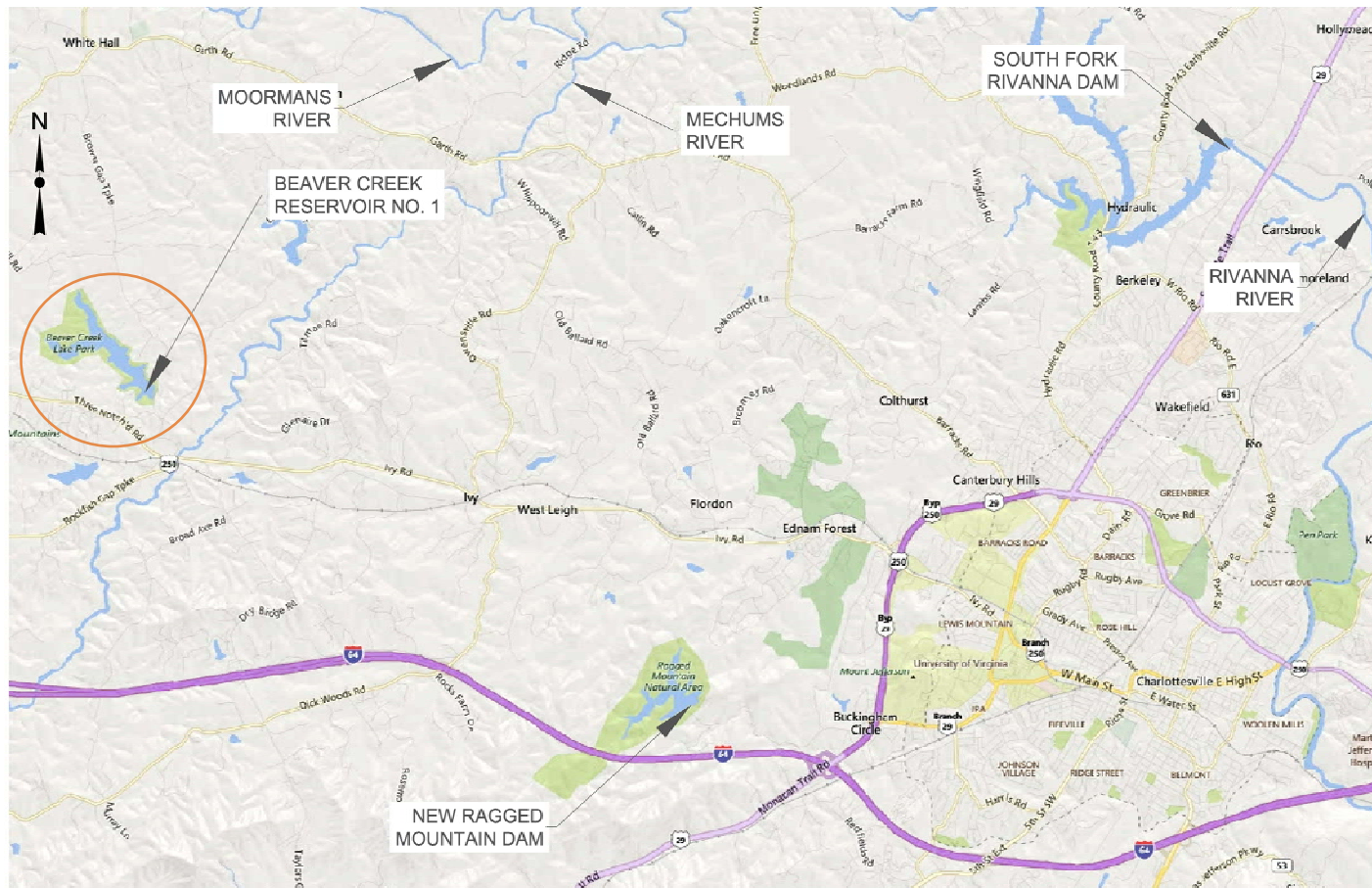
- **Rivanna Water and Sewer Authority – Sponsoring Local Organization**
  - Bill Mawyer, PE – Executive Director
  - Jennifer Whitaker, PE – Director of Engineering and Maintenance
  - Victoria Fort, PE – Project Manager
- **Schnabel Engineering, LLC –Planning Study Technical Contractor**
  - Randy Bass, PE – Quality Assurance Officer and Senior Project Consultant
  - JR Collins, PE – Project Manager
  - Hazen and Sawyer, Dovetail (Environmental, Cultural Resources sub-contractors)
- **US Department of Agriculture – Natural Resources Conservation Service (NRCS)**
  - Dana Perkins – NEPA Compliance Specialist, Cultural Resource Program Coordinator, Tribal Liaison
  - David Kriz – Assistant State Conservationist – Water Resource Operations

# Agenda for this Meeting

- 1. Discuss the history of the dam, planning study objectives and identify purpose and need for the project.
- 2. Discuss the Federal Watershed Rehabilitation Program, General Considerations for dam safety, and the overall schedule for the project planning.
- 3. Identify scoping concerns associated with this project, its watershed and the surrounding community.

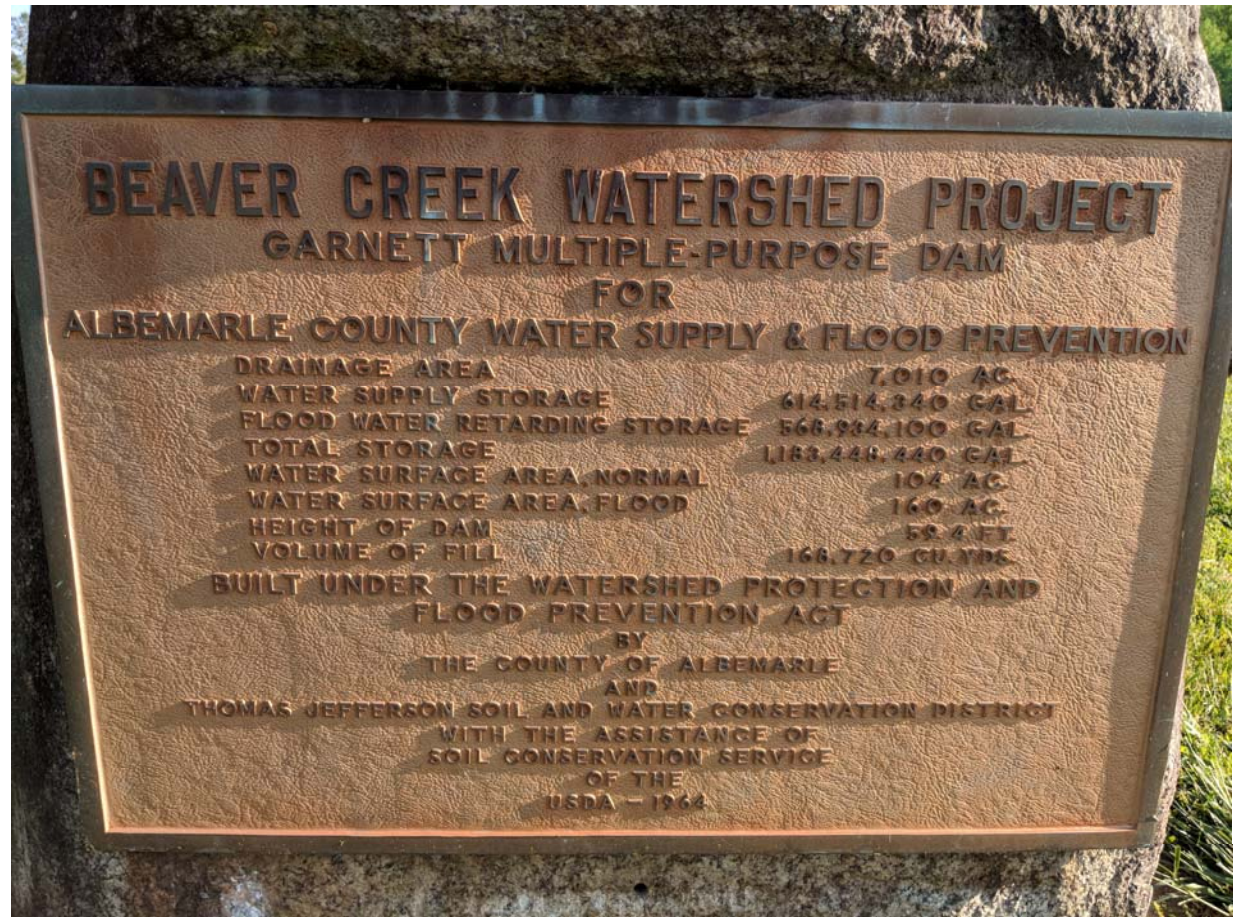
# History and Pertinent Information

- Owned and Operated by the Rivanna Water and Sewer Authority
- Located approximately 10 miles west of Charlottesville, Virginia
- Constructed in 1963 (57 years old) under the Watershed Protection and Flood Prevention Act by Albemarle County, TJSWCD with assistance from SCS (now NRCS)
- National Inventory of Dams ID = VA003122 (VA Inventory #003122)



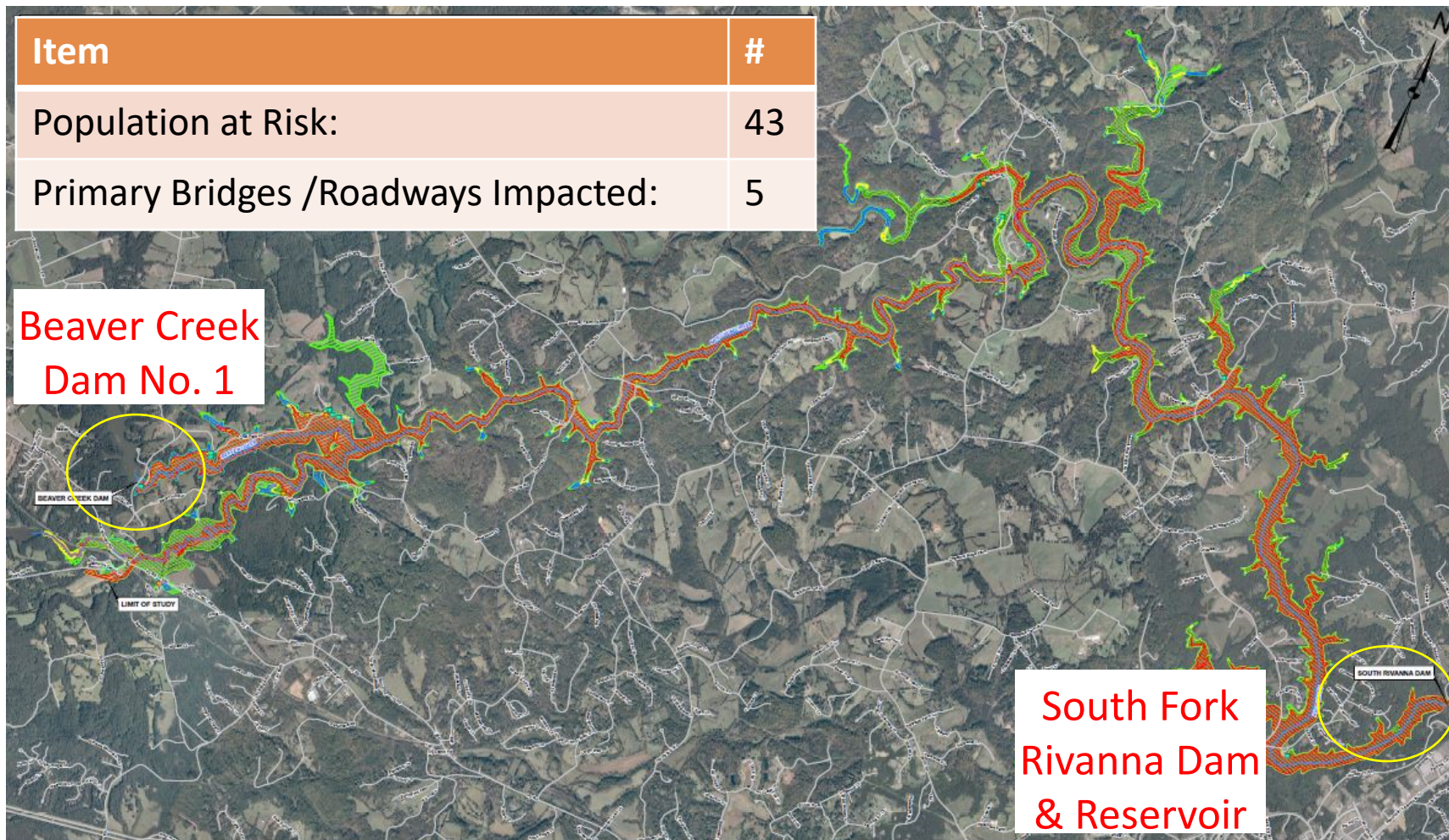
## Pertinent Information and Reservoir Storage

- Height of dam = 60 feet
- Drainage area = 6110 acres  
(~9.55 square miles)
- Design total storage capacity = 3,600 acre-feet
  - Water supply storage = 1,850 acre-feet
  - Flood storage = 1,750 acre-feet



# Downstream Hazards

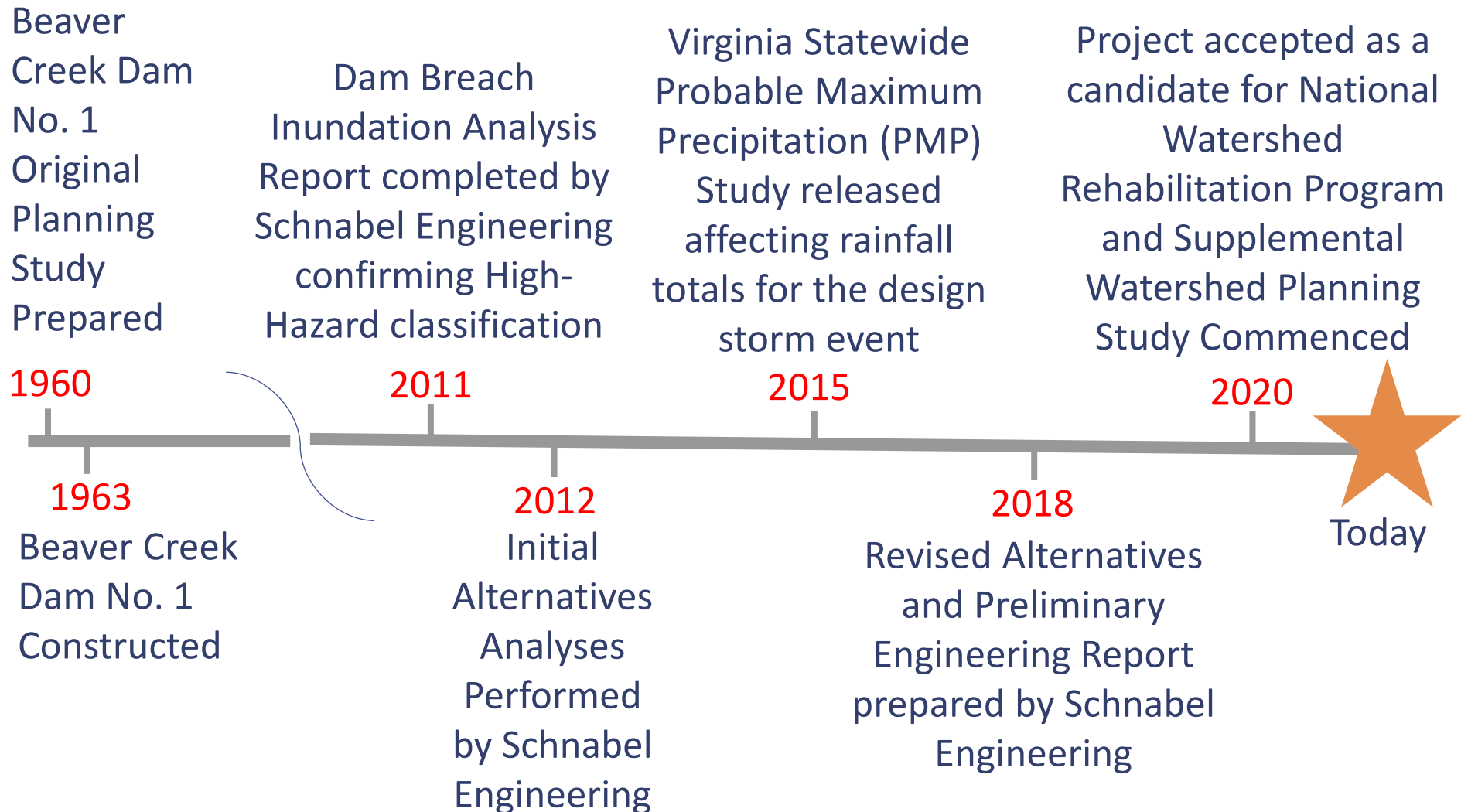
- This dam was originally designed as a significant hazard structure (Class B) by SCS in the early 1960's. Due to changes to regulatory requirements and the 2011 dam breach inundation analyses results, the dam has since been re-classified as high hazard.



## Beaver Creek Dam No. 1

- This dam is not exempt from Virginia DCR rules/requirements, and does not currently meet the requirements for high-hazard dams. Therefore, a spillway upgrade is required to rehabilitate the subject dam.
- The Supplemental Watershed Planning study is a prerequisite to receiving Federal funding for the design and construction of the rehabilitation alternative.
- The dam has been operating under a Conditional Operation and Maintenance Certificate since the hazard reclassification in 2012 under Virginia DCR Dam Safety until the spillway capacity sufficiently meets or exceeds the design storm event.

# Project Timeline

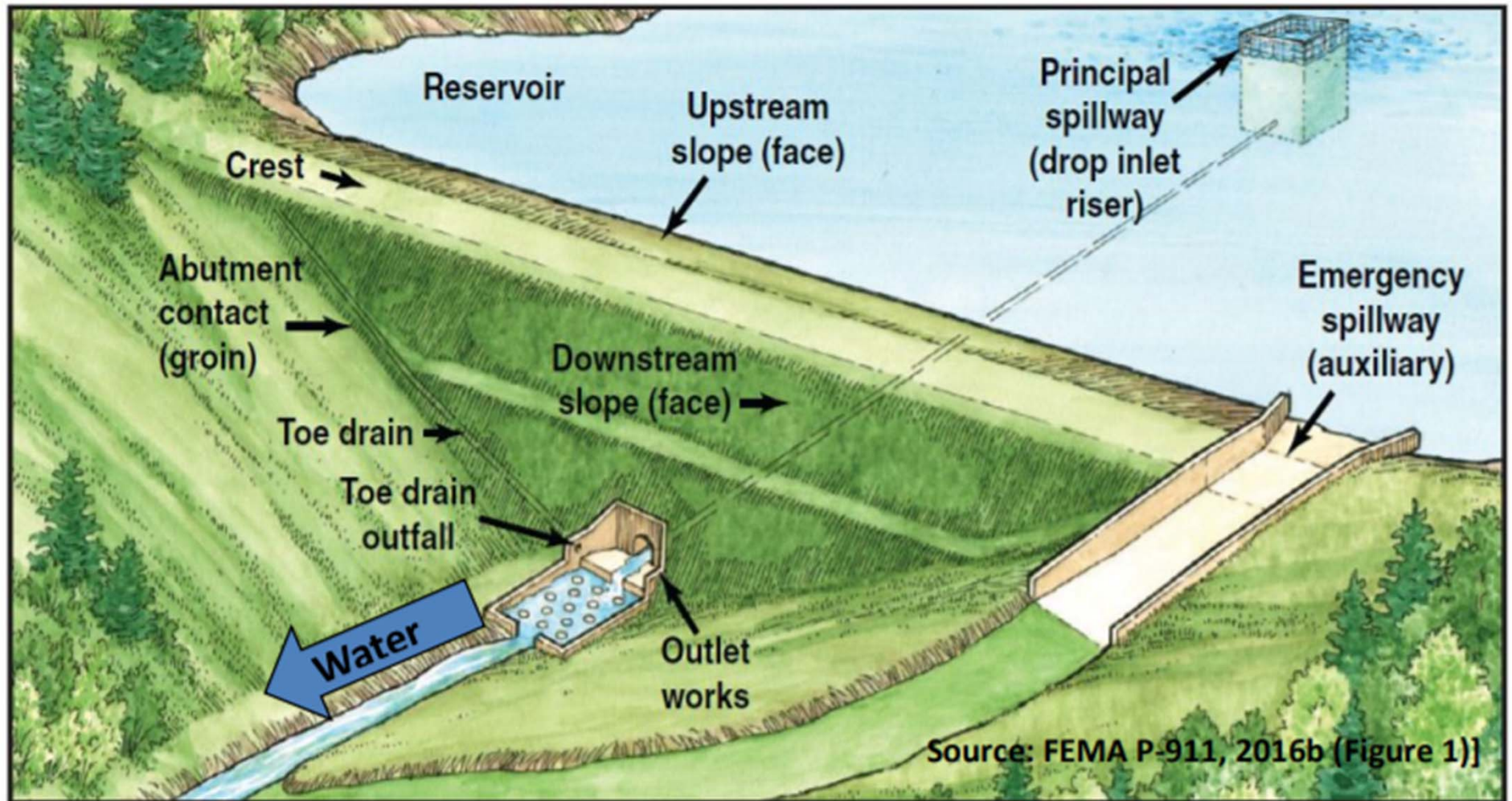




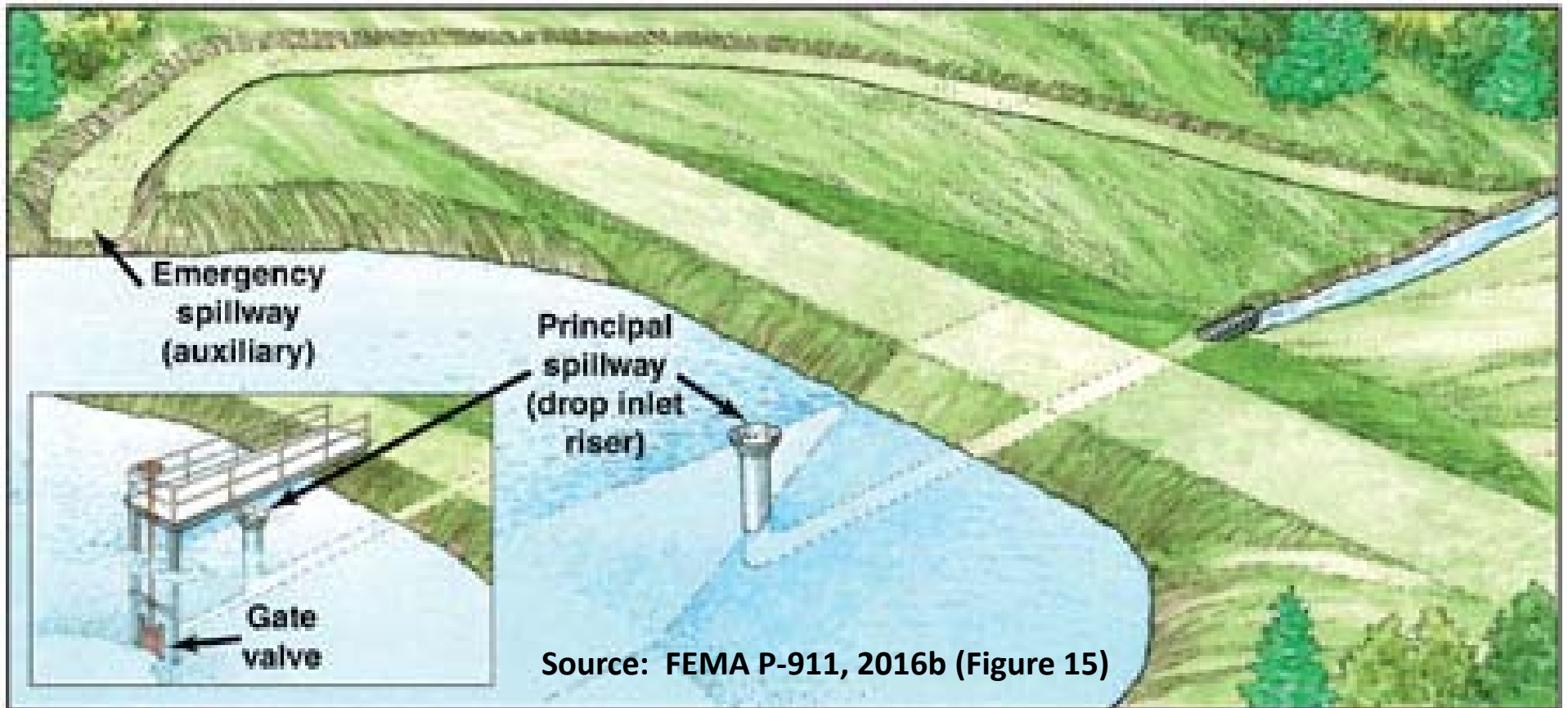
# Purpose and Need for the Dam

- Original Purposes of structure: flood mitigation and water supply
  - The reservoir serves as the primary raw water source for Crozet and is also used for recreational activities– Rowing team, fishing, picnic area, etc.
- Existing Spillways:
  - Reinforced-Concrete SCS Riser structure
  - 42-inch diameter reinforced concrete principal spillway conduit
  - Vegetated earthen auxiliary spillway channel 200 feet wide in left abutment
- Raw water pumphouse located at the toe of the existing dam will likely require relocation

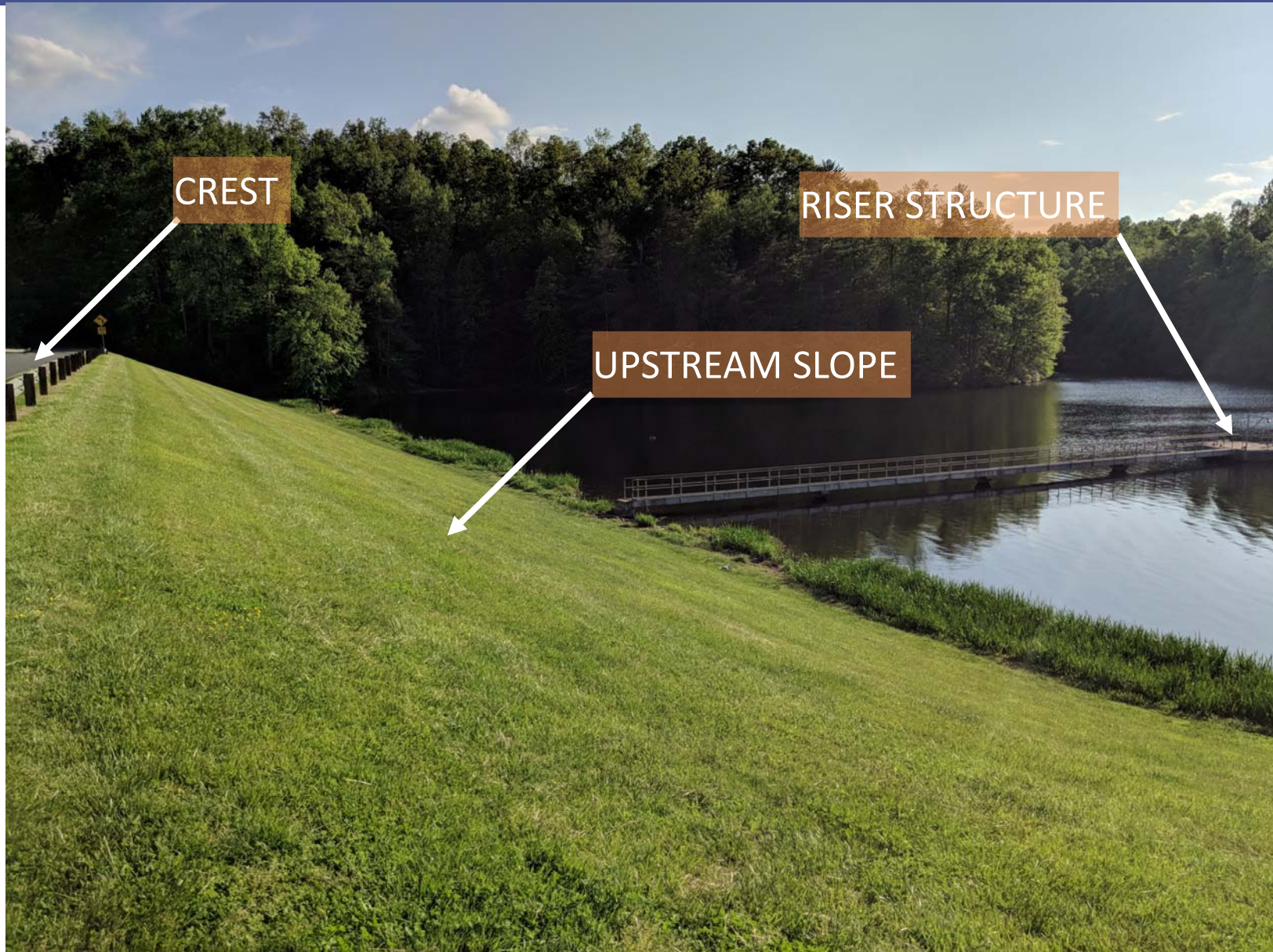
# Components of a Dam (General)



# Components of a Dam (Existing Beaver Creek Dam No. 1)



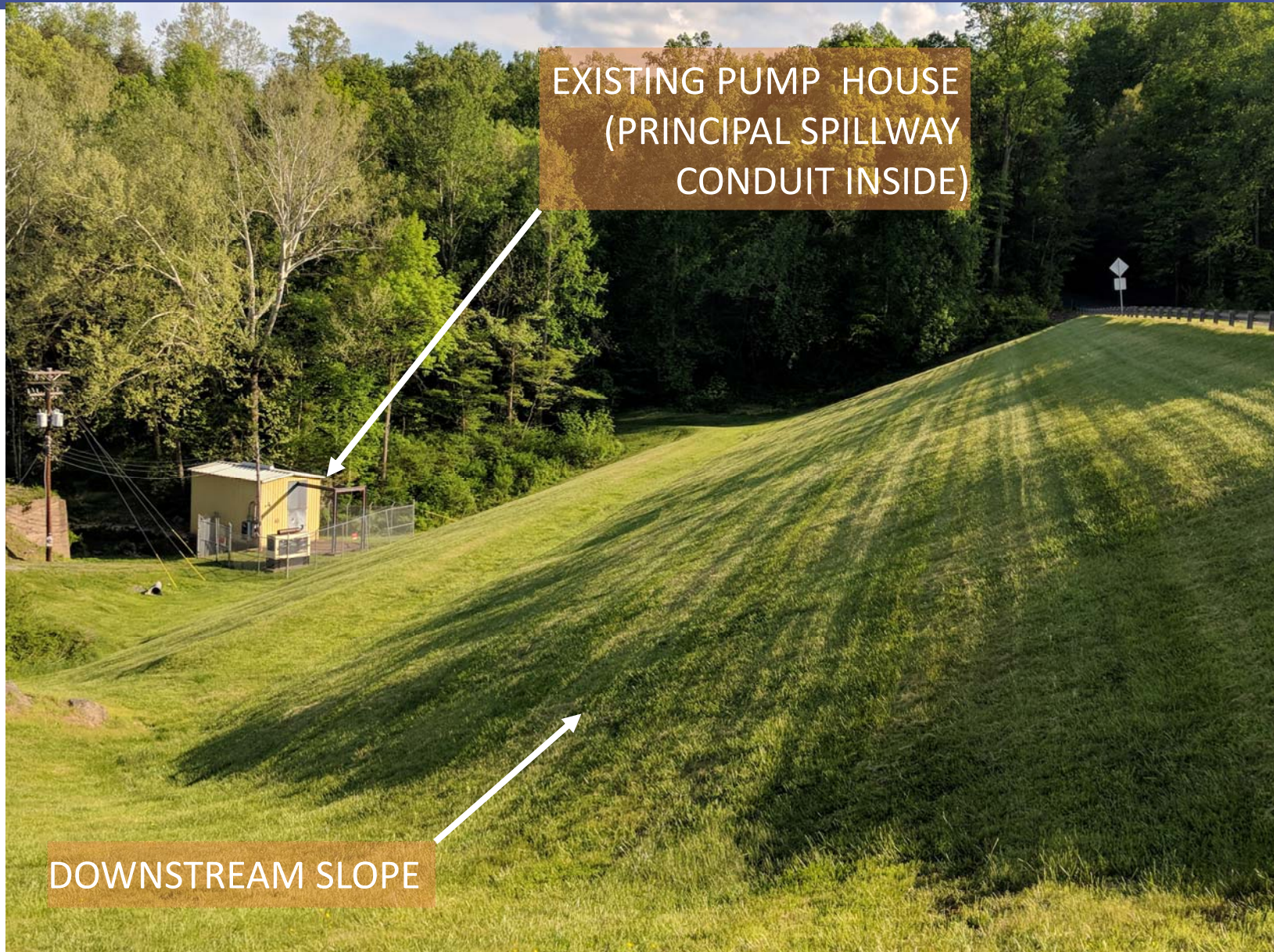
# Upstream Slope and Riser



# Top of Reinforced-Concrete Riser Structure



# Downstream Slope and Pumphouse



# Pumphouse and Spillway Outlet

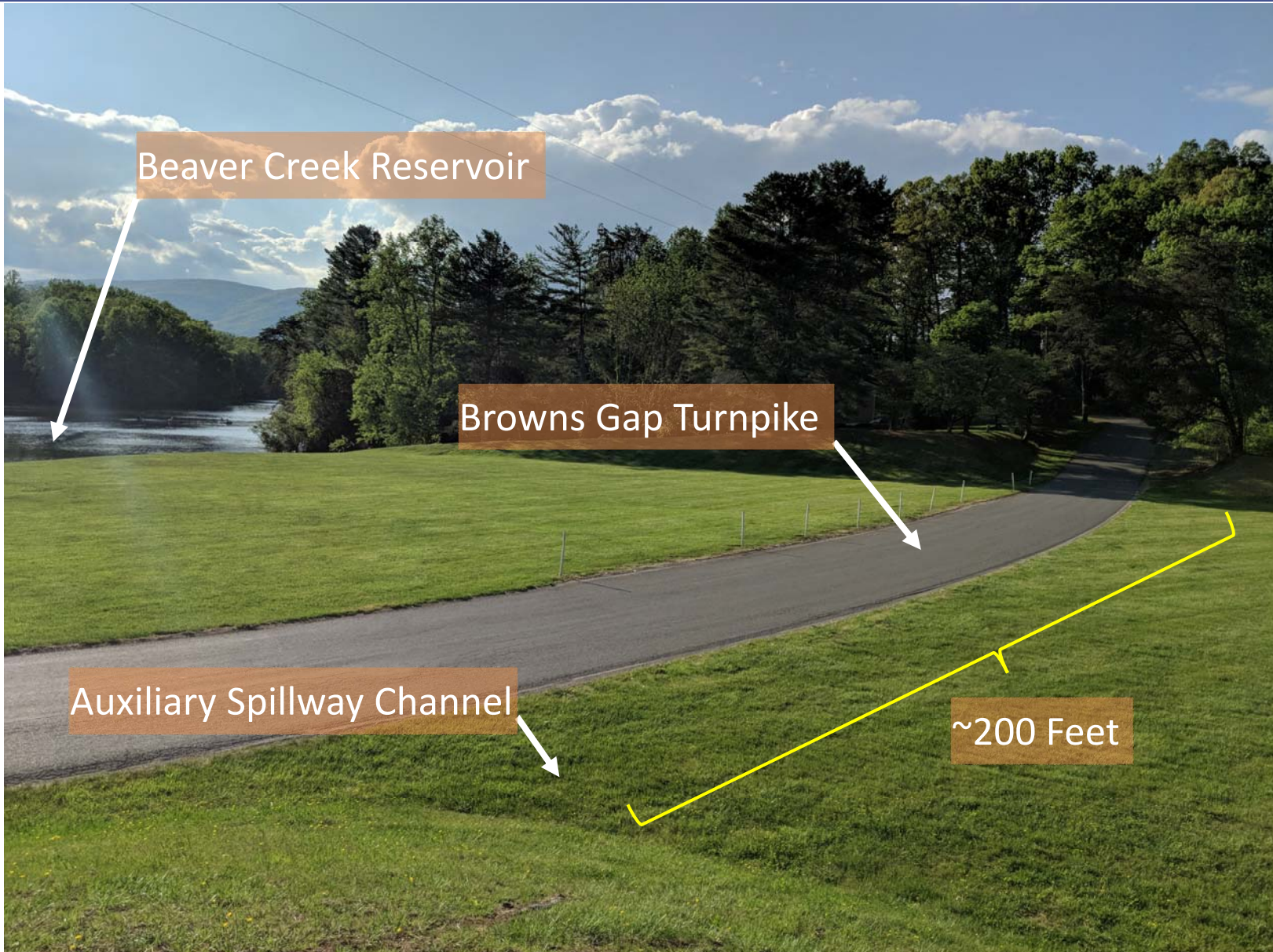


# Inside of Water Intake Structure





# Auxiliary Spillway Channel



Beaver Creek Reservoir

Browns Gap Turnpike

Auxiliary Spillway Channel

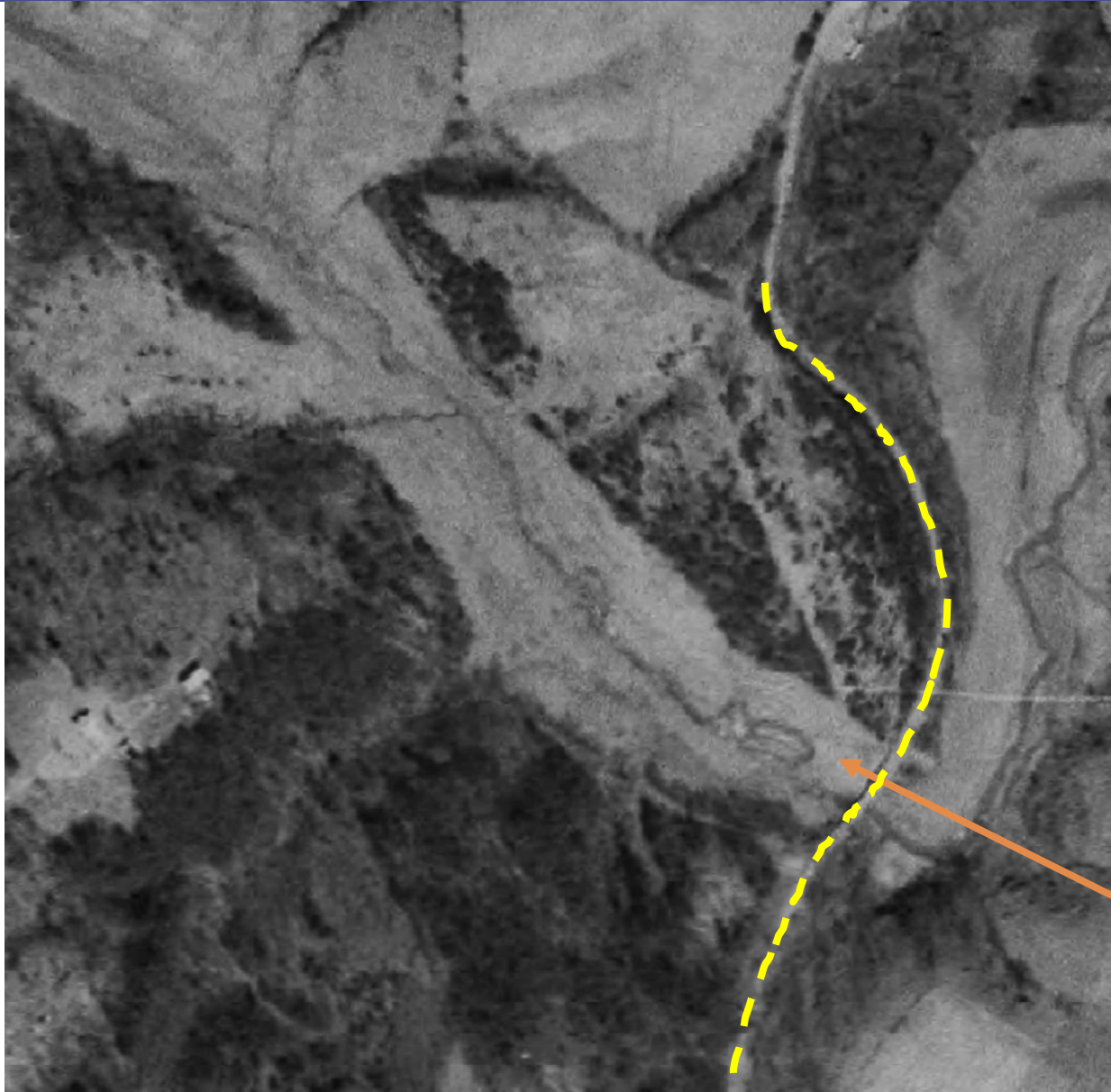
~200 Feet

# Beaver Creek Dam No. 1 – Current Aerial Photo



DAM  
LOCATION

# Beaver Creek Dam No. 1 – 1963 Aerial Photo



DAM  
LOCATION

# Watershed Rehabilitation Program and Cost Sharing

- The Federal Government can provide cost sharing and technical assistance for projects qualifying for the USDA's National Watershed Rehabilitation Program
- Cost sharing is contingent on whether funding is available
- Typical Cost Sharing Ratio:
  - 65% of Total Design and Construction Costs paid by Federal Government
  - 35% of Total Design and Construction Costs paid by SLOs

# Supplemental Watershed Plan

- Plan-Environmental Document (Plan-EA) objectives:
  - Assess the Beaver Creek No. 1 Watershed
  - Evaluate the performance of the existing watershed structure
  - Develop a plan to address compliance issues (i.e. spillway rehabilitation)
  - Study, evaluate, survey and reduce environmental and social impacts
  - Determine if available federal financial assistance will be allocated to fund the design and construction of the project

# Public Participation

- The objective is to inform the public and watershed stakeholders of the planning effort
- The planning study requires a series of public meetings to solicit questions and comments associated with:
  - Scoping Topics
  - Identification of project opportunities and resource concerns
  - Other items of concern

# History of the NRCS Watershed Program

- Watershed planning has been an important part of the U.S. Department of Agriculture's mission since the 1930's.
- Franklin D. Roosevelt
  - Soil Conservation Act (Public Law 74-46)
    - Established the Soil Conservation Service (SCS)
  - Flood Control Act of 1936 (Public Law 74-738)
  - Flood Control Act of 1944 (Public Law 78-534)
    - Authorized SCS to begin work on first watershed projects
- Dwight D. Eisenhower
  - Agricultural Appropriations Act of 1953 (Public Law 83-156)
    - Authorized additional watershed projects

# History of the NRCS Watershed Program

- The Natural Resources Conservation Service (NRCS) is a branch of the U.S. Department of Agriculture, and was formerly known as the Soil Conservation Service (SCS)
- During the 1950's, the Watershed Protection and Flood Prevention Act (Public Law 83-566) was developed and adopted by Congress
  - This act, quoted in part below, gave the SCS permanent watershed planning authority

Erosion, floodwater, and sediment damages in the watersheds of the rivers and streams of the United States, causing loss of life and damage to property, constitute a menace to the national welfare; and it is the sense of Congress that the Federal Government should cooperate with States and their political subdivisions, soil or water conservation districts, flood prevention or control districts, and other local public agencies for the purpose of preventing such damages, of furthering the conservation, development, utilization, and disposal of water, and the conservation and utilization of land and thereby of preserving, protecting, and improving the Nation's land and water resources and the quality of the environment.



# History of the NRCS Watershed Program

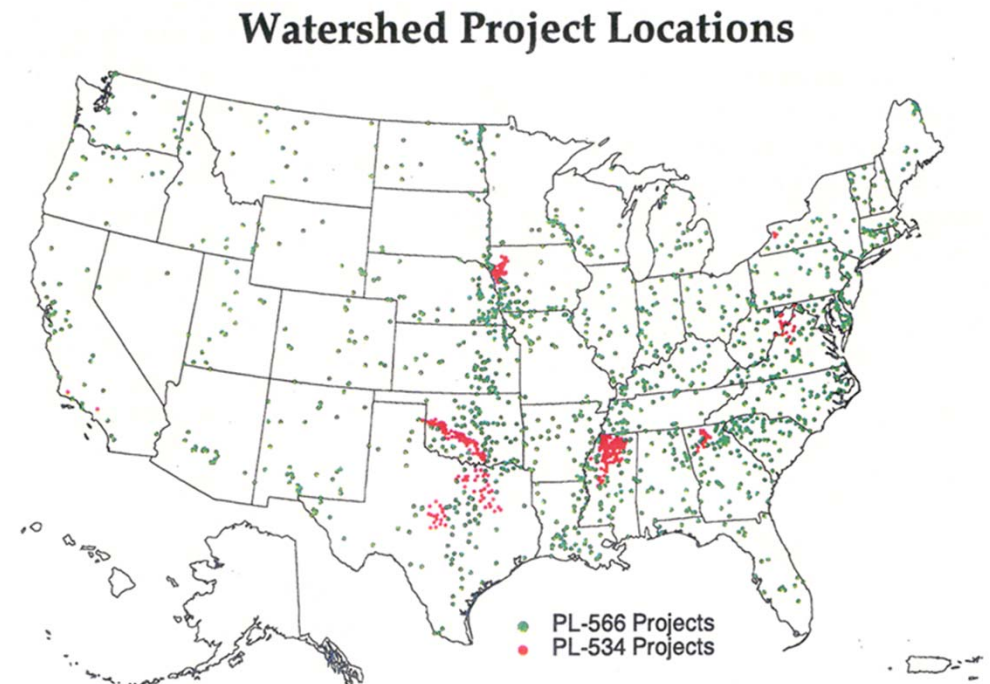
- More than 11,800 flood control dams have been constructed in the U.S. under this program since 1948
  - Watershed projects provide an estimated \$2.2 billion in annual benefits in reducing flooding and erosion damages, recreation, water supplies, and wildlife habitats
- The law established a vehicle for federal technical and financial assistance to be provided to local sponsors to plan and implement watershed projects
- Small Watershed Rehabilitation Amendments of 2000 (Section 313, Public Law 106-472)
  - Amends PL 83-566 to add authority for rehabilitation

# Projects Eligible for Federal Assistance

- Flood Mitigation (Flood Damage Reduction)
- Watershed Protection
- Rural, Municipal, and Industrial Water Supply
- Water Quality Management
- Agricultural Water Management
- Fish and Wildlife
- Public Recreation
- Watershed Structure Rehabilitation

# NRCS Watershed Program Dams in Virginia

- 150 total watershed dams
  - 104 are categorized as high-hazard dams, 30 are significant hazard dams, and 16 are low-hazard dams.
- The NRCS designed and funded construction of these dams for flood control
- The dams are operated and maintained by local sponsors
- NRCS provides technical assistance to sponsors



# Notable U.S. Dam Failures

Buffalo Creek Valley –  
West Virginia –  
February 26, 1972

**THE WEATHER**  
FAIR tonight, low in low 40s.  
Tuesday cloudy, high in upper 60s.  
Details on Page 2A.

**Charleston Daily Mail**

**FINAL EDITION**

VOLUME 158, NO. 50

CHARLESTON, WEST VIRGINIA, MONDAY EVENING, FEBRUARY 28, 1972

TEN CENTS

## Logan Flood Toll 66; 400 Missing

### Hundreds Search Disaster Area; Cause Of Break Gets Attention

By CRAG AMMERMAN  
MAN, W. Va. (AP) — National Guardsmen and hundreds of volunteers today found additional victims of the Buffalo Creek hollow flood disaster as they began an intensive search of the 20-mile area that was virtually wiped out Saturday morning.

Helicopters flying rescue missions brought from the hollow this morning five persons who had been isolated for 48 hours since an earthen dam crumbled and let loose an 18-acre lake which devastated 16 coal camps and towns that were dotted the Appalachian hollow.

The official death toll is 66.

but reports filtering in from the hollow indicated many more had been found.

Spokesmen at the Appalachian Regional Hospital at Man said they had treated and released between 200 and 300 persons since the disaster struck. Of the 11 persons admitted, all were in critical condition, spokesmen said.

National guardsmen and hundreds of volunteers searched today for an estimated 400 missing persons, victims of flooding that left 44 known dead and wiped out whole communities. All residents of the hollow whose homes escaped damage in the flooding were being evacuated by guardsmen, authorities said.

A spokesman said the evacuation was ordered to permit a cleanup of the entire area, and to enable all survivors to receive typhoid shots and medical examinations.

Newsmen were under orders to remain away from the devastated area while recovery and evacuation efforts were under way.

A National Guardsman flying helicopter rescue missions said dogs were found gnawing at bodies.

Shortly before noon, three mobile health units equipped with physicians and emergency medical supplies set out up the hollow.

See JENNINGS Floodings, p. 1A, Col. 1

**IN FLOOD AREA**

### Moore Stresses Relief For Living

By BOB MELLACK  
OF The Daily Mail Staff

Cluck that stardes the imagination exists in narrow Buffalo Creek valley in Logan County where 46 persons died Saturday morning and where 200 are believed missing, Gov. Moore said today.

But, "We will whip this tragedy," Moore told reporters. He said it could occur again, given the same peculiar set of circumstances that caused a coal refuse dump to break, sending a wall of water down the 18-mile creek bed.

For now, the governor said, the emphasis must be on helping the living, a job being done in what he described as a serious health hazard caused by deterioration of the dam.

Food and water are being flown into the zone, according to the governor, and relief to the American Red Cross which has set aside \$5 million for immediate relief in the area.

While the humanitarian response has been magnificent, Moore said the task of restoring order and helping survivors is almost insurmountable.




**BRADY HARBO**  
**Sad Survivors Wait Word Of**

## Notable U.S. Dam Failures

Teton Dam—  
Idaho—  
June 5, 1976



## Notable U.S. Dam Failures

Laurel Run Dam –  
Pennsylvania –  
July 19, 1977

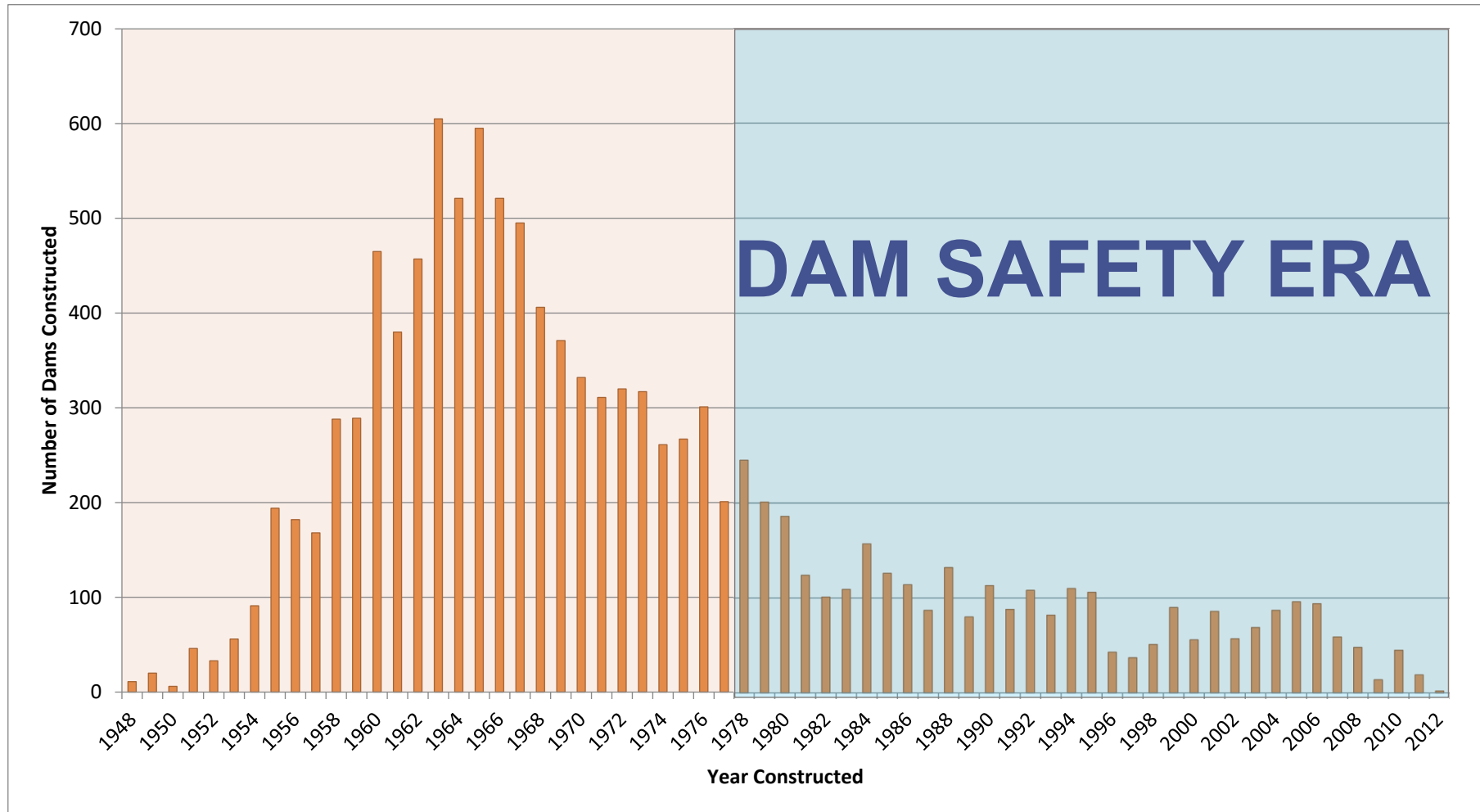


## Notable U.S. Dam Failures

Kelly Barnes  
Dam –  
Toccoa,  
Georgia –  
November 6,  
1977



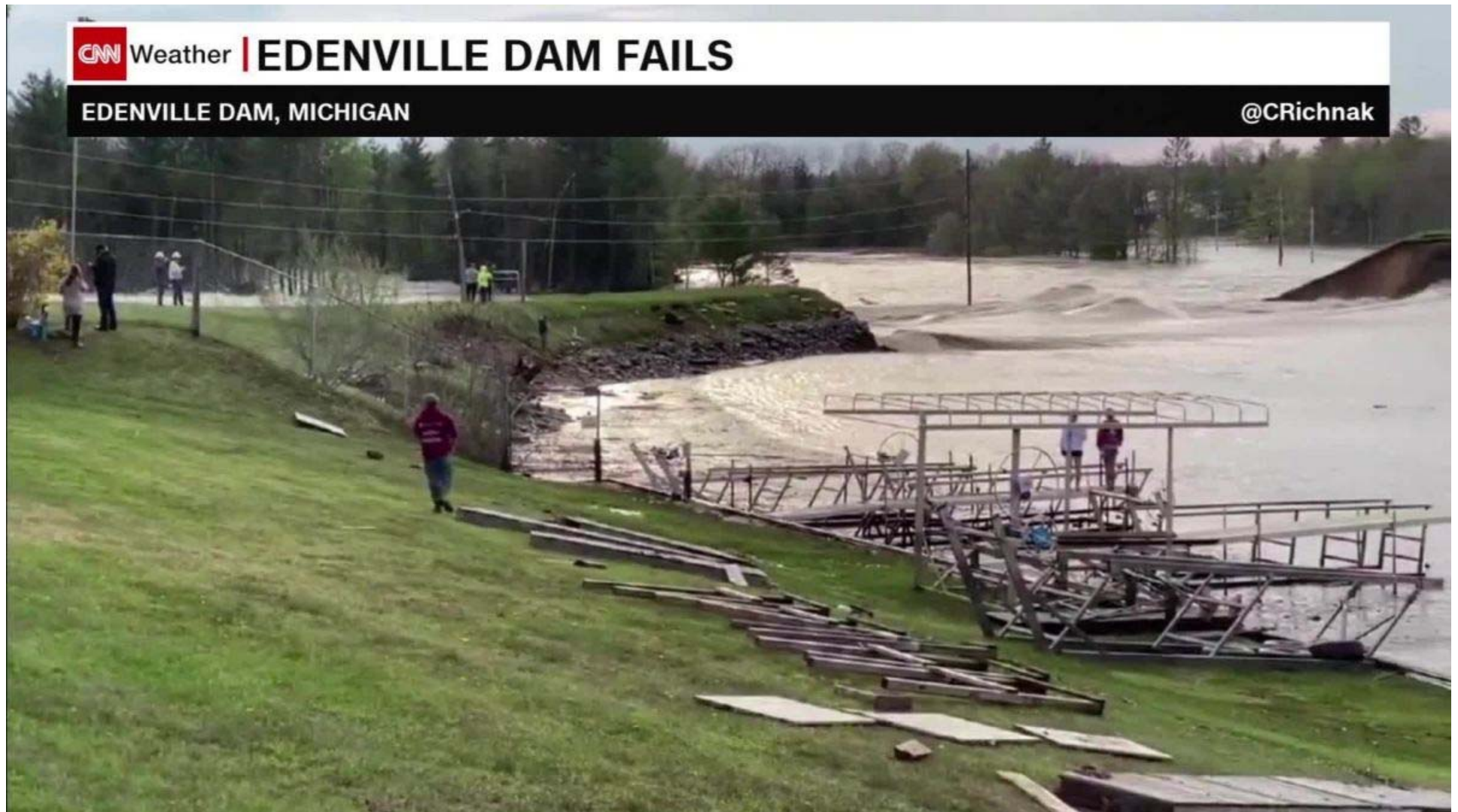
# Watershed Dams in the Dam Safety Era





# Recent U.S. Dam Failure

Edenville Dam – Midland, Michigan – May 2020



# Dam Safety Agencies & Organizations



FEMA



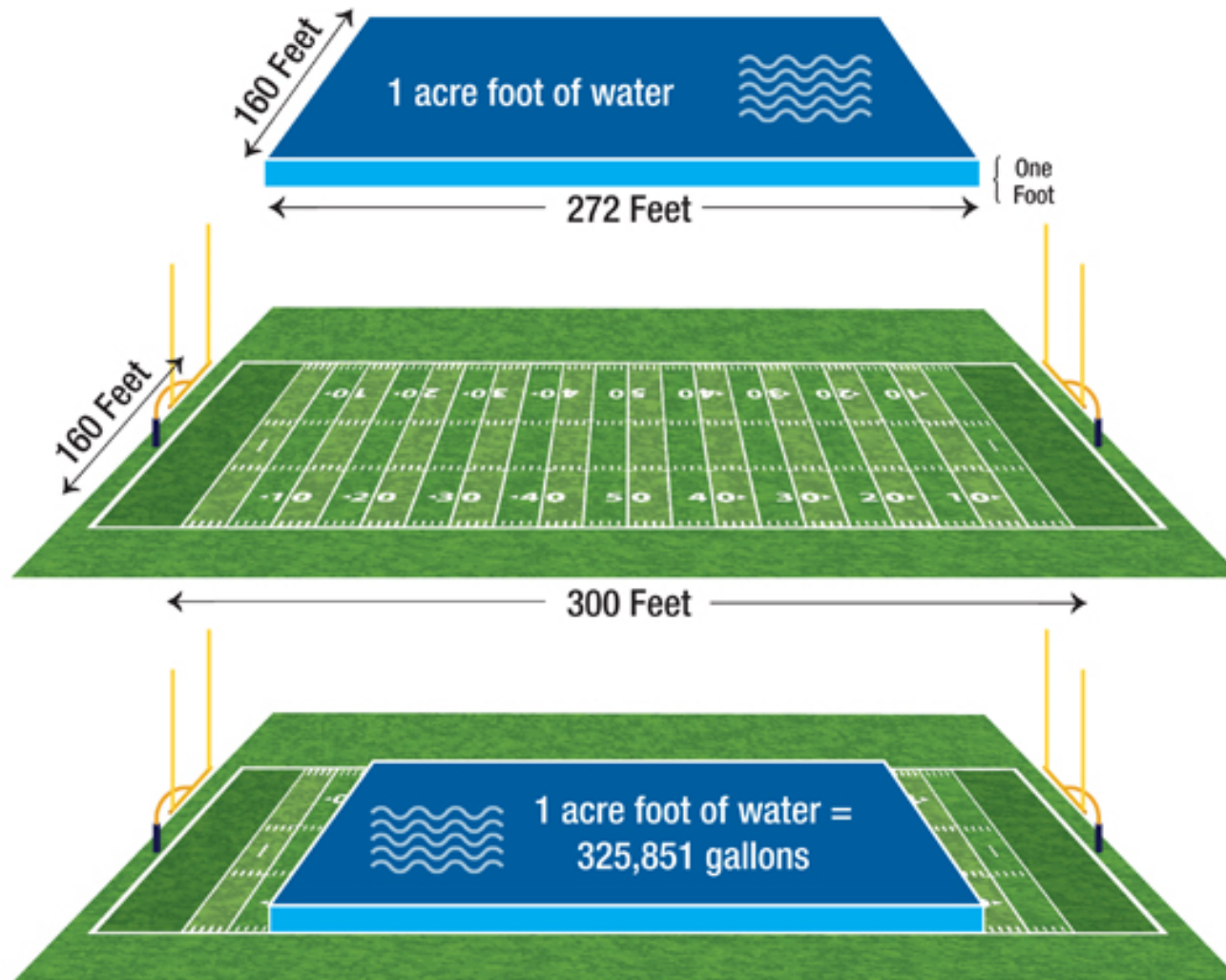
# Virginia Dam Safety

- Virginia Dam Safety Act – February 1, 1989
- By definition, an “impounding structure” or “dam” means a man-made structure used to retain or store waters or other materials and includes:
  - All dams that are **25 feet or more in height** and create an **impoundment capacity of 15 acre-feet\*** or greater,
  - AND-
  - All dams that are **6 feet or more in height** and create an **impoundment capacity of 50 acre-feet\*** or greater

\*(1 acre-foot ≈ 326,000 gallons)



# How much water is one acre-foot? (Football Field Comparison)



# Virginia Dam Hazard Classifications

- High-Hazard Dams

- Dam failure will cause probable loss of human life or serious economic damage.
- Economic damage may occur to buildings, industrial/commercial facilities, public utilities, major roadways\*, railroads, personal property and agricultural interests.

100-year, 24-hour rainfall = 9.0 inches  
 PMP, Local 24-hour rainfall = 28.8 inches  
 PMP, Tropical 24-hour rainfall = 31.3 inches

- Significant Hazard Dams

- Improper operation or dam failure may cause the loss of life or appreciable economic damage.
- Economic damage may occur to buildings, industrial/commercial facilities, public utilities, secondary roadways\*\*, railroads, personal property, and agricultural interests.



Virginia Department of Conservation & Recreation

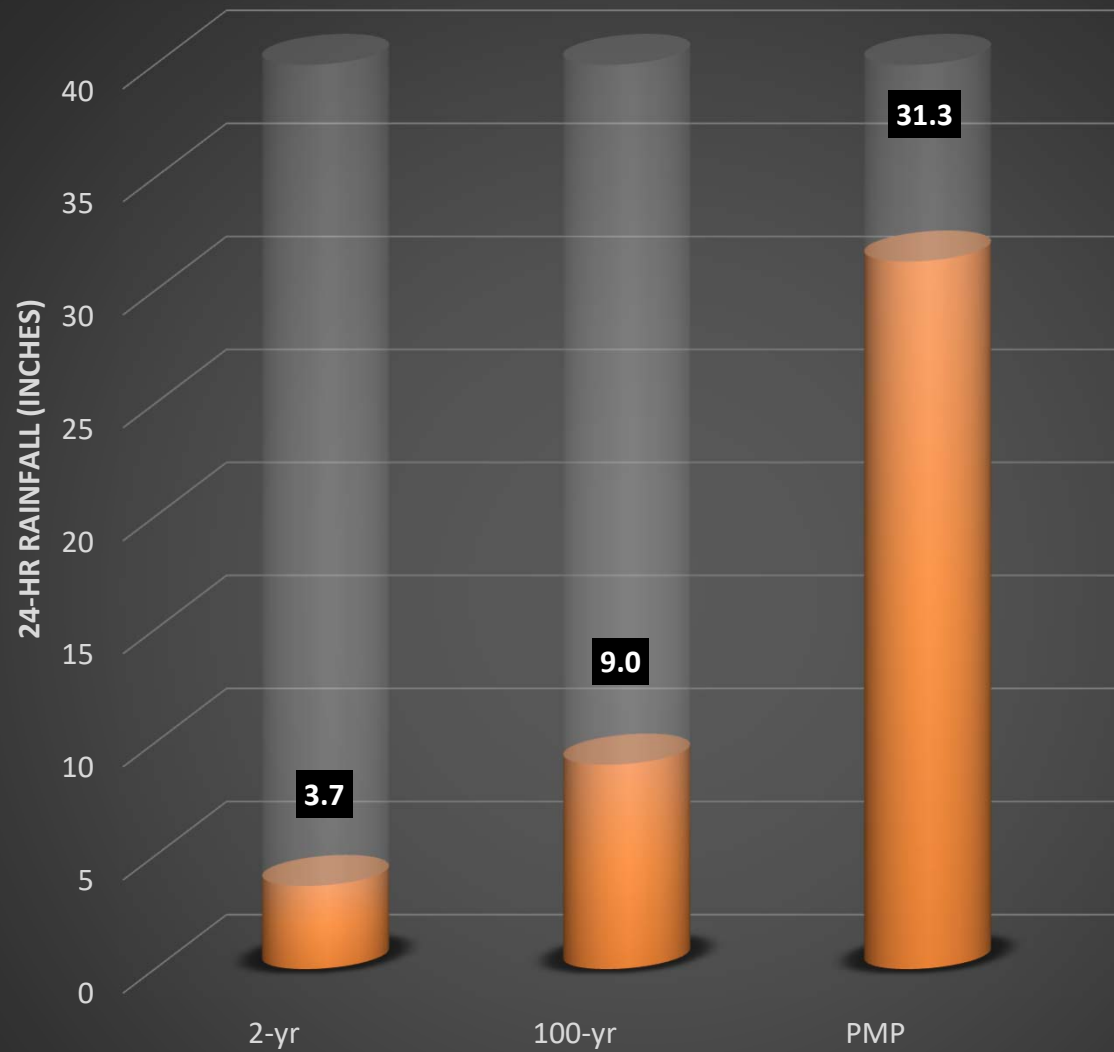
- Low Hazard Dams

- Improper operation or dam failure would not be expected to result in loss of human life and would cause no more than minimal economic damage.

\*Major Roadways include, but are not limited to, interstates, primary highways, high-volume urban streets, or other high-volume roadways except those having an AADT volume of 400 vehicles or less.

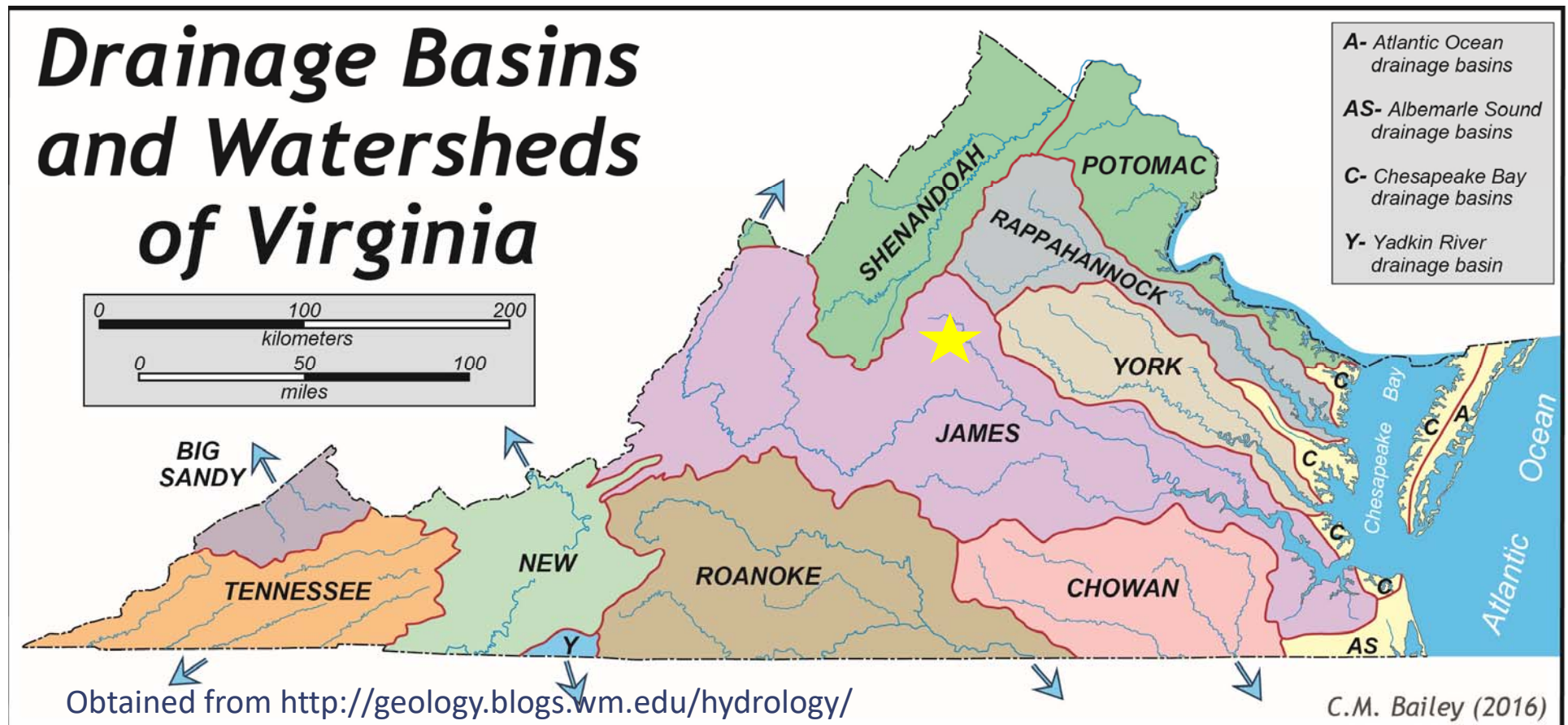
\*\*Secondary Roadways include, but are not limited to, secondary highways, low-volume urban streets, service roads, or other low-volume roadways, except those having an AADT volume of 400 vehicles or less.

# Relative Rainfall Comparison



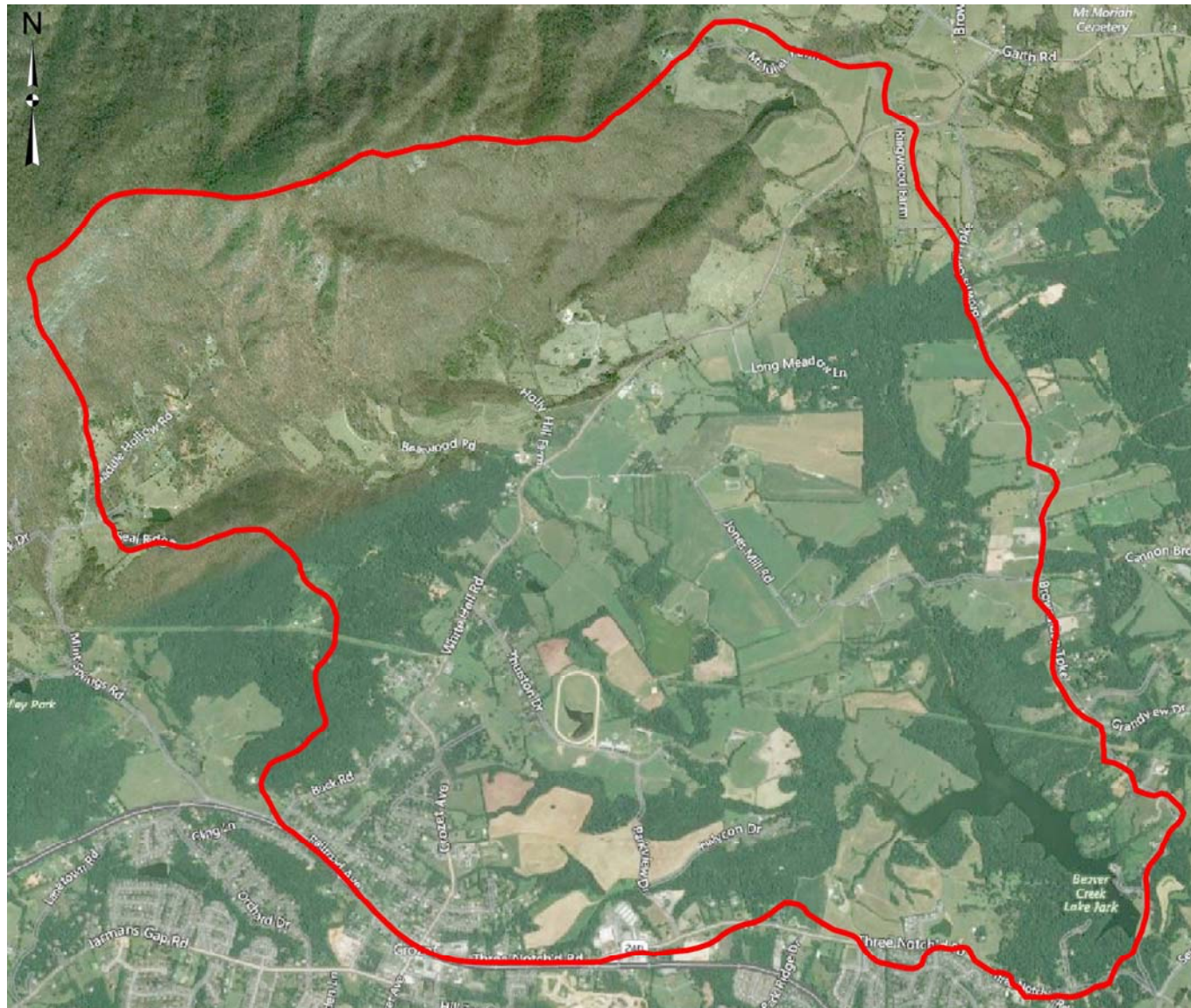
# Beaver Creek Watershed

- Located in northwest Albemarle County, Virginia approximately 10 miles west of Charlottesville, Virginia.



construction of the floodwater retarding structure (Beaver Creek Watershed Structure No. 1).

# Beaver Creek Dam 1 Watershed (recent aerial photography)





# Beaver Creek Dam 1 Watershed (1963 aerial photography)



# Beaver Creek Supplemental Watershed Plan

- Main Focal points of analysis and study:
  - Hydraulic capacity of existing spillway outlet works
  - Performance during design storm event(s)
    - Includes integrity analyses of earthen auxiliary spillway
  - Downstream areas (flooding, breach inundation zone)
  - Upstream areas (flooding, additional storage capacity)
  - Relocation of existing pump house and raw water line
  - Economic and social benefits
  - VDOT coordination and new vehicular bridge over spillway
  - Temporary impacts during construction:
    - Temporary environmental and/or Social impacts
    - Erosion and Sedimentation Control
    - Traffic control and detours
  - Environmental assessment
  - Cultural resource assessment
  - Minimum Inflow Release requirements
  - Sedimentation Rate and useful life of structure

# Project Timeline

- Identify Resource and Scoping concerns
- Evaluate Existing Structure
- Formulate and Refine Alternatives
- Submit Supplemental Watershed Plan-EA document for NRCS review
- Solicit feedback from public on draft Plan-EA document



# Supplemental Watershed Planning Schedule

- August/September 2020:
  - Kickoff and Initiate Planning Study
  
- December 2020 (Today):
  - First Public Meetings
  
- March 8, 2021:
  - Completion of Phase I (Collection and Analysis of Information)
  
- June 7, 2021:
  - Completion of Phase II (Inventory Resources and Analyze Resource Data)
  
- October 7, 2021:
  - Completion of Phase III (Alternative Formulation, Evaluation, Decision)
  - (Another public meeting will take place during Phase III)
  
- July 19, 2022:
  - Completion of Phase IV (Preparation of Plan-Environmental Document) and of the planning study. Final design of the selected alternative will begin thereafter.

# Supplemental Watershed Plan - Scoping

- “Scope” is defined as the range of actions, alternatives, and impacts to be considered in an Environmental Assessment document
- Scoping is used to identify significant issues for detailed analysis and eliminate issues that are not significant
- Identification of scoping concerns begins with this meeting and following public meeting (later this evening)
- Scoping will solicit the involvement of:
  - Federal, State, and Local agencies
  - Public interest groups
  - Property owners
  - Upstream and downstream stakeholders
- Relevant issues and concerns identified through scoping, including direct, indirect, and cumulative actions and impacts will be addressed in the Plan document

# Typical Scoping Concerns Matrix

## Typical Scoping Concerns

|                                   |   |   |                               |                             |
|-----------------------------------|---|---|-------------------------------|-----------------------------|
| National Economic Development P&G | Air quality   | Coral reefs   | Cultural resources            | Ecologically critical areas |
| Endangered and threatened species | Environmental justice and civil rights              | Essential fish habitat                              | Fish and wildlife             | Floodplain management       |
| Forest resources                  | Invasive species                                    | Land use  | Migratory birds               | Natural areas               |
| Parklands                         | Prime and unique farmland; farmland of significance | Public health and safety                            | Regional water resource plans | Riparian areas              |
| Scenic beauty                     | Scientific resources                                | Sole source aquifers                                | Social issues                 | Soil resources              |
| Water quality                     | Water resources                                     | Waters of the U.S., including special aquatic sites | Wetlands                      | Wild and scenic rivers      |

## Scoping Concerns - Live Comment Period

- 1. Jennifer Williams – concerned with potential increased traffic flow on Jones Mill Road.
- 2. (Chat Q&A)
- 3. (Submitted written Statements)
- 4. Ed Brooking: Impacts to Jones Mill Road may be disastrous. Also – emergency management response time may be a major concern.
- 5. Dr. Chris Scott – Emergency response time is critical, three to five minutes can make a significant difference.
- 6. Heather Adams – Concerns: Transportation for UVA/Charlottesville commuters. Will increase travel time, and cause an economic impact. Concerned with downstream sediment, fish, mussels.
- 7.
- 8.
- 9.
- 10.

## Public Participation – Questions, Concerns, & Comments

- Project stakeholders are invited and encouraged to submit questions, concerns, and comments regarding the plan development and scoping concerns at this time or following the meeting.
- Questions, concerns, and comments may be submitted by e-mail to [jcollins@schnabel-eng.com](mailto:jcollins@schnabel-eng.com) or in writing to:

Schnabel Engineering, LLC

Attn: J R. Collins

12301 Research Blvd., Building 4, Suite 150

Austin, Texas 78759

- Questions, concerns, and comments associated with this first scoping meeting will be accepted through Monday, December 21, 2020





# Thank you for Participating in the Beaver Creek No. 1 Supplemental Watershed Plan – Environmental Assessment - Initial Public Presentation

