

Virtual Public Meeting for Assunpink Creek Dam No. 8

August 12, 2020

by

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Today's Objectives

Summarize National Dam Rehabilitation Program

Review Planning Activities To Date

- Basic resource information on Assunpink Creek Dam No. 8
- “Scope” of the Rehabilitation Project
- Findings
- Alternatives Analyzed and Evaluated
- Consequences and Effects
- The Recommended Alternative for Rehabilitation

Encourage Input and Contributions By Others

Key Players in Planning Process

Six Local Sponsors for Assunpink Creek Watershed

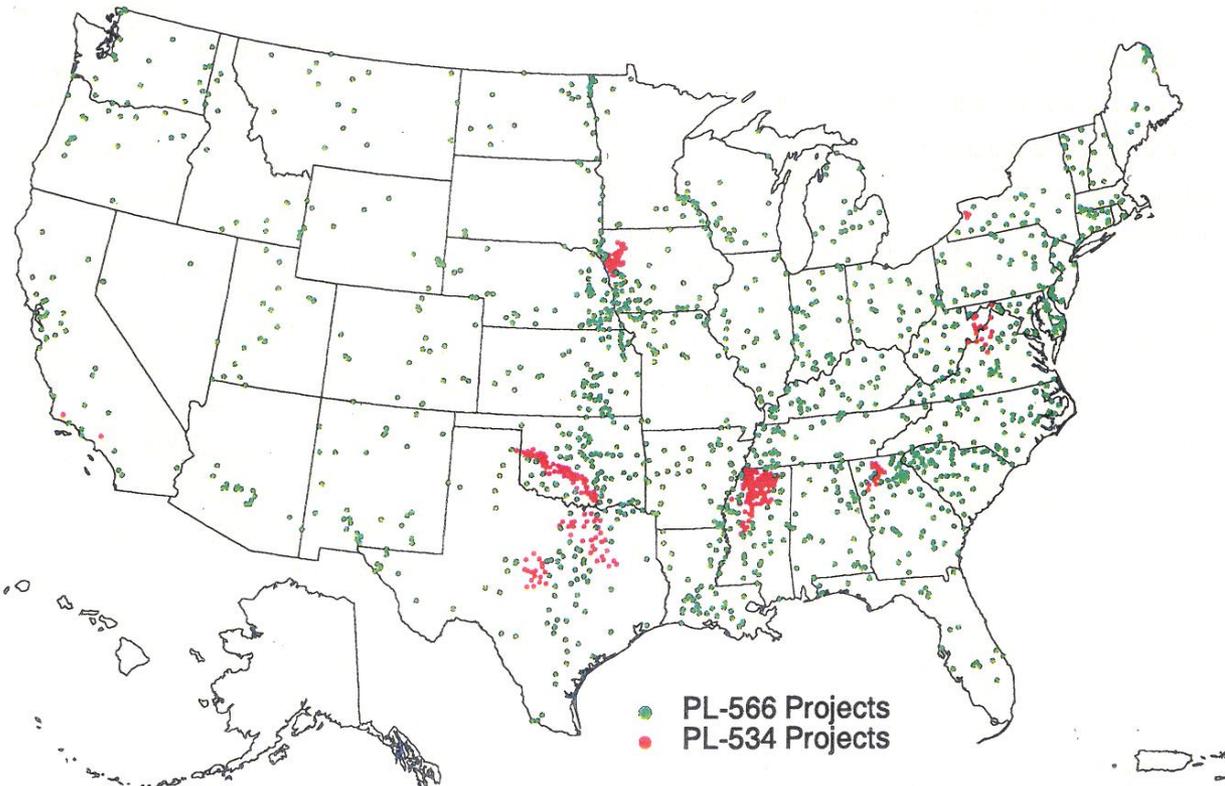
- Hamilton Township (Lead) – owner and operator of Dam No. 8
- Mercer County Soil Conservation District
- Freehold Soil Conservation District
- Mercer County
- Monmouth County
- New Jersey Department of Environmental Protection

Technical Support – USDA, NRCS in Somerset, NJ

Technical Contractors – Aterra Solutions, Schnabel Engineering , EA Engineering, Science and Technology, and ERM

Small Watershed Program

Watershed Project Locations



NRCS has assisted communities build almost 12,000 dams since 1948

Rehabilitation Defined

Extend service life of dams and meet applicable safety & performance standards

Prolong beyond original life

Replace deteriorating components

Repair after catastrophic events

Upgrade to meet dam safety laws

Decommission (removal)

The only dams eligible for rehabilitation under this program are those originally built with SCS/NRCS assistance

Dam Rehabilitation Planning and Implementation Process

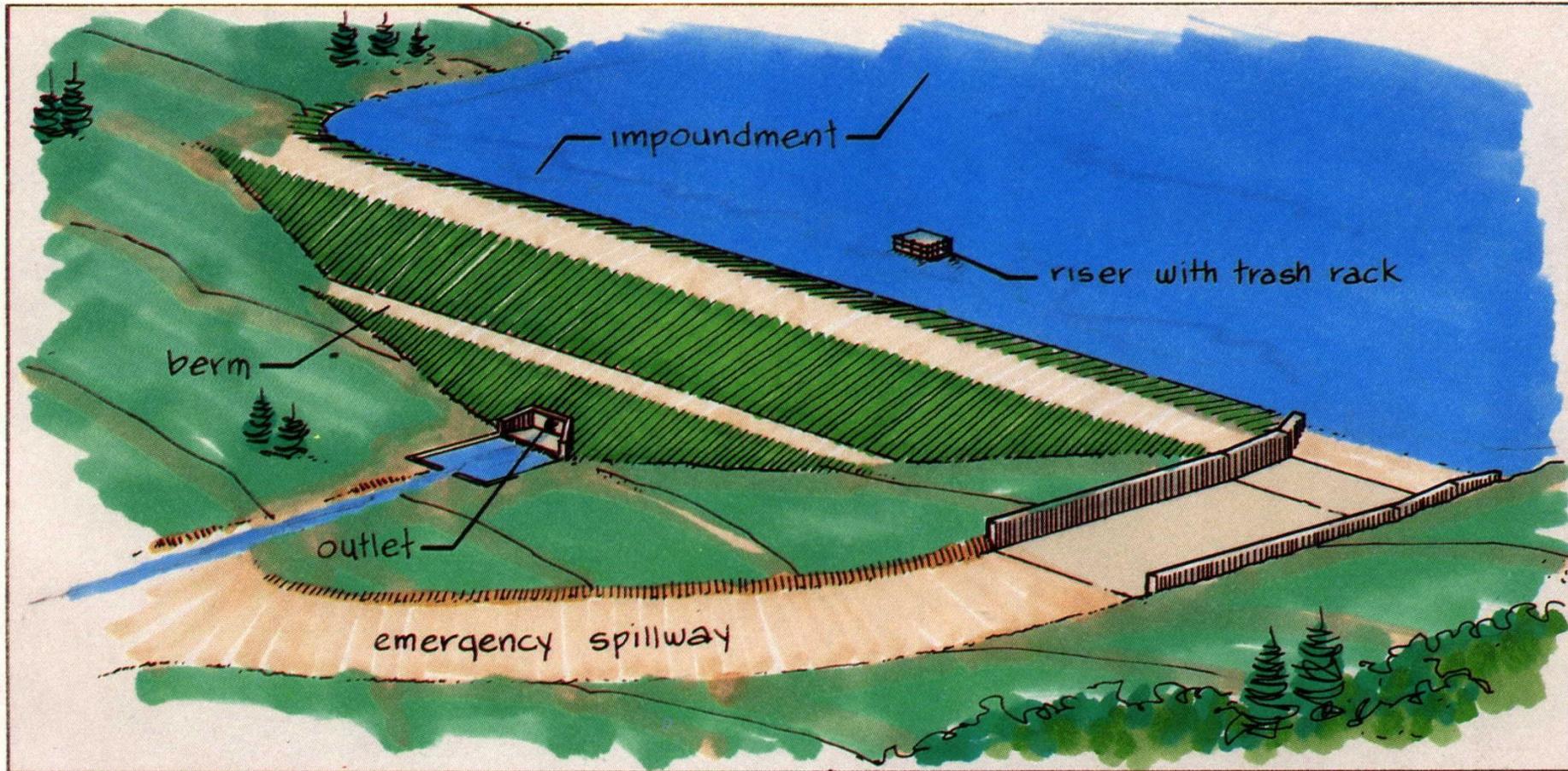
1. Sponsor application
2. Site assessment and risk analysis
3. Ranking of applications
- 4. Project Planning**
5. Design
6. Construction

Cost-Share With Dam Rehab.

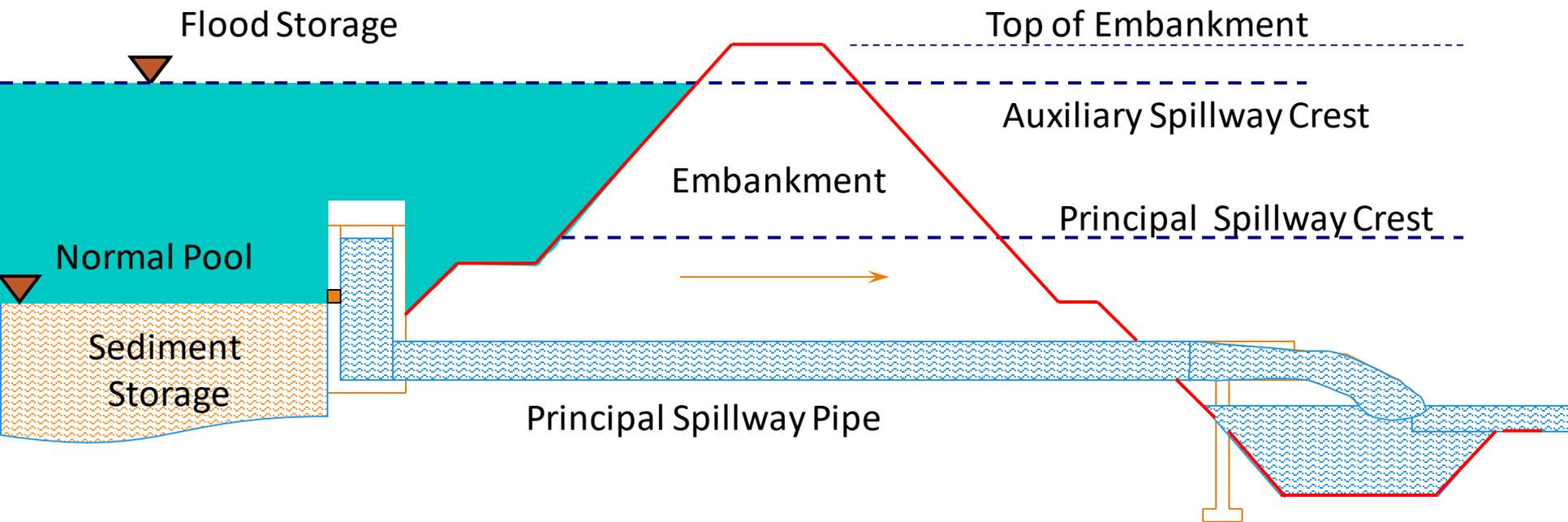
- NRCS Funds
 - 100% of Planning Costs
 - 100% of Design Costs
 - 65% of Total Project Costs (NTE 100% of Const. Costs)
 - NRCS Staff Costs are paid 100% by NRCS

- Local Sponsors' Funds
 - 35% of Total Project Costs (Cash or In-Kind Credit)
 - 100% of Permit Costs

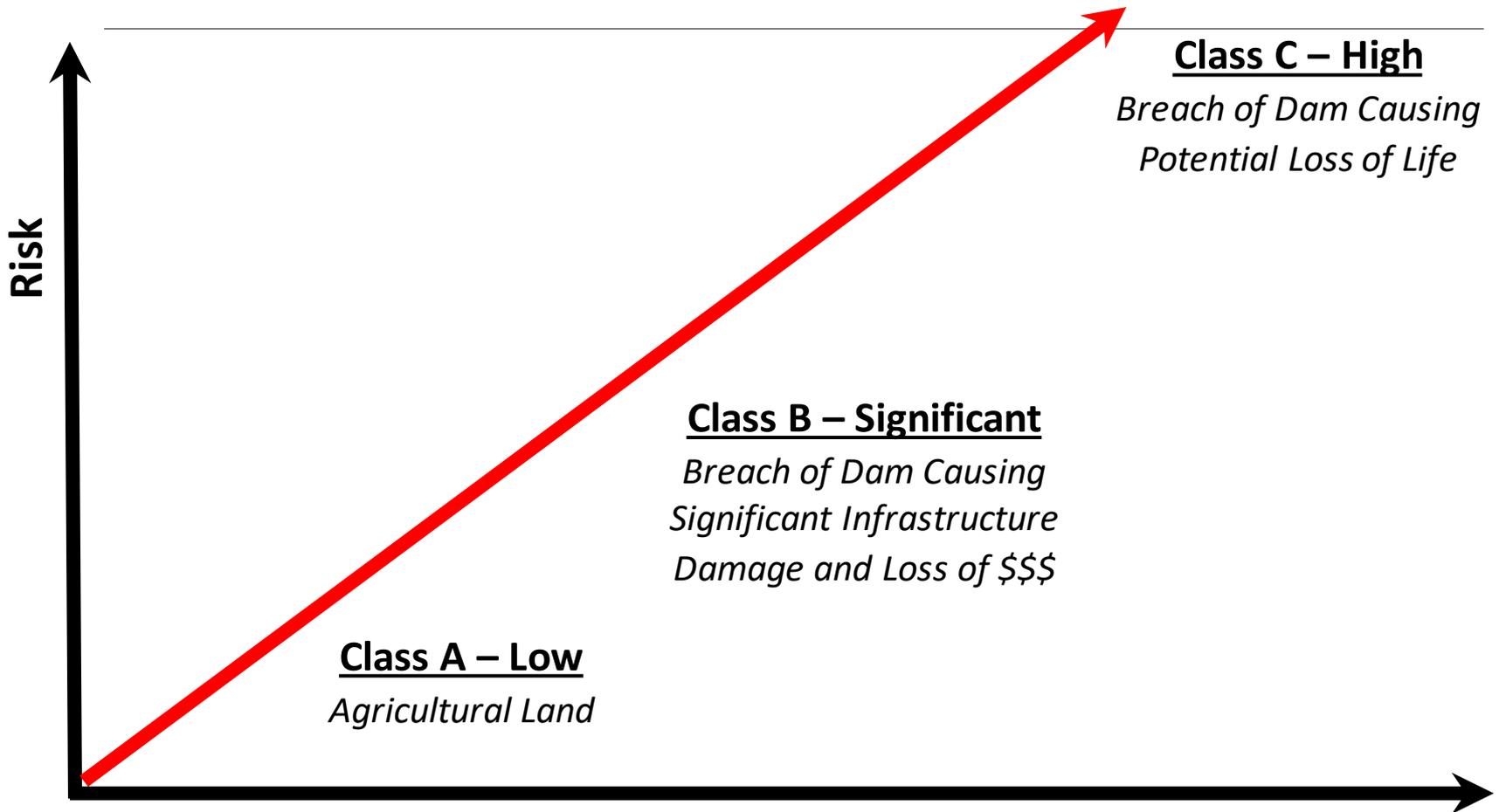
Typical Earth Dam



Cross-Section of a Typical Floodwater Retarding Structure



Hazard Classes of Dams



Assunpink Creek Watershed Dam No. 8

Known locally as Robert G. Martin Lake

Located on Pond Run

Built in 1967 as a single-purpose flood control dam

Drainage area = 1,914 acres or 2.99 square miles

Normal pool surface area = 13 acres

Length = 1,440 feet

Height = 18 feet

Spillway Width = 200 feet

Principal Spillway is 36" Reinforced Concrete Pipe Drop Inlet – 2 Stage

Constructed as a High hazard dam













Condition of the Dam

- Inspected annually and regularly mowed and maintained.
- Breach Inundation Mapping completed in 2015 by Civil Dynamics, Inc.
- The Dam Assessment in 2017 found the following conditions:
 - Auxiliary spillway has insufficient capacity
 - Auxiliary spillway is susceptible to erosion during design flow events
- Sponsors are responsible for meeting Dam Safety Regulations for high hazard dam and addressing deficiencies.
- Sponsors requested Federal Assistance with dam rehabilitation from NRCS in November 2017.
- Received funding for planning in July 2018.
- Planning contract awarded in May 2019.

Scoping

- Defined by Laws and/or Executive Orders
 - “Scope” is the range of actions, alternatives, and impacts considered.
 - Scoping is used to identify the significant issues to be analyzed in detail and to eliminate from detailed study the issues that are not significant.
- The relevant resource issues were identified through Scoping last June.

Groups of Resource Concerns

- Soils
 - Water
 - Air
 - Plants
 - Animals
 - Humans
-
- Issue - Is it **Relevant** (**Yes** or **No**) to the Proposed Action?

Findings To Date

Environmental Findings

- Soils - Prime farmland soils and soils with statewide importance are in the **project area** (area of initial assessment versus limits of disturbance).
- Water Quality – Lake and Pond Run listed as impaired water bodies:
 - Total suspended solids
 - Turbidity
- No wild, scenic, or recreational rivers in or near the project area.
- Wetlands present in the project area include:
 - 43.2 acres of freshwater forested/shrub wetlands
 - 2.3 acres of freshwater emergent wetlands
 - 25.7 acres of Lake wetlands
 - 1.0 acre of freshwater pond wetlands
 - 6.3 acres of riverine wetlands
- Vernal Pools in the project area:
 - 3 verified vernal pool locations
 - 5 potential vernal pool locations

Environmental Findings (cont.)

- Dam is within the interstate coastal zone under New Jersey's Coastal Management Program, but project site is not influenced by tidal areas.
- Floodplain - the FEMA flood insurance rate map indicates the project area is in a special flood hazard area.
- Air Quality – the area violates EPA's standard for one of the six pollutants (ozone) and is thus considered a nonattainment area.
- Plants:
 - No federally-listed plants in project area
 - No state-listed endangered plant species
- Noxious Weed and Invasive Plant Species (in NJ)
 - 5 prohibited weed species
 - 19 restricted weed species

Environmental Findings (cont.)

- No unusual Fish and Wildlife identified in project area.
- Animals – One federally-listed T&E species
 - Northern Long-Eared Bat
- The NJ Statewide Species list includes the following species:
 - 9 bird species that received a breeding status of endangered
 - 5 bird species with a breeding status of threatened
 - 38 bird species with a breeding status of special concern
 - 8 reptile and amphibian species that are species of special concern
- Volunteers have observed within Hamilton Veterans Park, 2 special concern species:
 - Fowler's toad (*Anaxyrus fowleri*)
 - Eastern box turtle (*Terrpene carolina carolina*).
- There is also prime habitat for the endangered wood turtle.

Note: An official survey has not been conducted over the project area.

Environmental Findings (cont.)

- No known invasive fish or wildlife species upstream of the impoundment, within Pond Run, or Veterans Lake.
- Bald eagles have occasionally been observed in the project area. However, no nesting eagles are within the project site.

Social and Cultural Resources

- 2 historic districts, 5 historic properties, and at least 11 archaeological resources are present within 2 miles of the project area.
 - Consultation has been initiated with the NJ Division of Historical Resources and the SHPO using the project limits of disturbance.
- Recreation is extensive in the park;
 - Two large parking lots.
 - Several athletic fields and picnic areas.
 - Many trails, both paved and unpaved, used for hiking, walking, and biking.
 - Two designated dog parks.
 - One playground.
 - There are athletic fields in the northeast corner of the project area, which include baseball fields, tennis, bocce, croquet, badminton, and shuffleboard courts.

Social and Cultural Resources

- Natural Area and Parklands:
 - Dam is located in the middle of Hamilton Veterans Park.
 - No federally-designated parks or natural areas.
 - The park and its trails are included on the NJ Trails Association Webpage as some of the “great trails” in New Jersey.

- Visual Aesthetics and Scenic Beauty
 - Park has impacts on tourism, recreation, and residents’ satisfaction.
 - Value for scenic beauty and outdoor activities – walking, biking, hiking, bird-watching, etc.

Environmental Justice / Civil Rights

- The project area population has the following diversity:
 - 28% non-white
 - 28% Hispanic
- The area within the breach inundation zone (compared to Hamilton Township, Mercer County and the State of New Jersey) has the following:
 - lower per capita income
 - higher level of poverty, and
 - lower median household income

Economic Impacts of Existing Dam

- Watershed modeled with dam in place and dam removed
- Flooding impacts to downstream properties:
 - Residential Buildings = 853 houses and 4 apartment complexes
 - Commercial Buildings = 49
 - Public Buildings = 10
 - Total = 916

Economic Impacts / Damages ^{1/}

Without Dam

- Residential Bldgs. = \$2,224,000
- Commercial Bldgs. = \$173,800
- Public Bldgs. = \$8,400
- Crossings/Roadways = \$423,000
- **Total Damages = \$2,829,200**

With Dam in Place

- Residential Bldgs. = \$1,922,900
- Commercial Bldgs. = \$143,000
- Public Bldgs. = \$7,200
- Crossings/Roadways = \$379,200
- **Total Damages = \$2,452,300**

1/ Floodwater damage reduction to buildings and vehicles

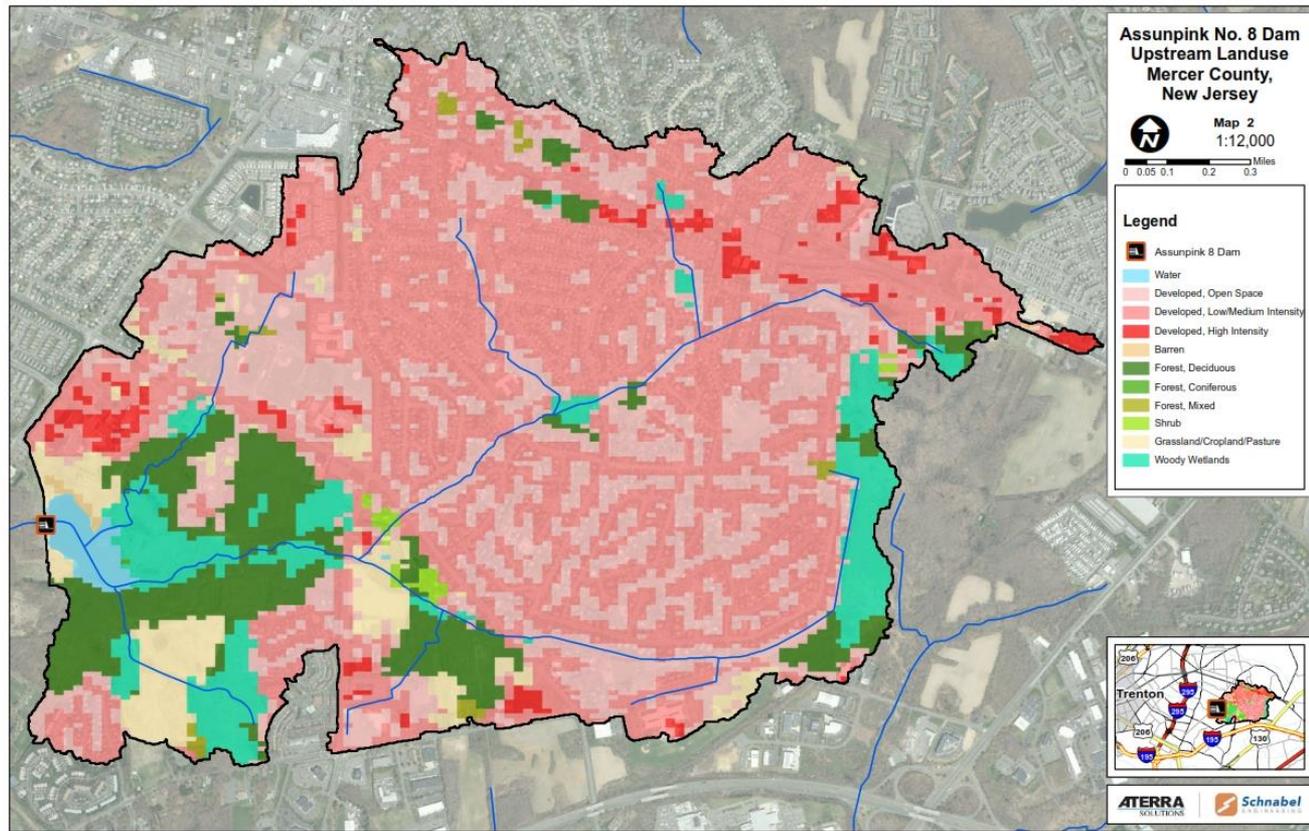
Benefits of the Dam

- Flood Reduction Associated with the Dam:
 - 916 buildings
 - 64 Roadways
 - 8 Stream Crossings
- \$376,900 average annual benefits

Petr Masopust and Paul Welle

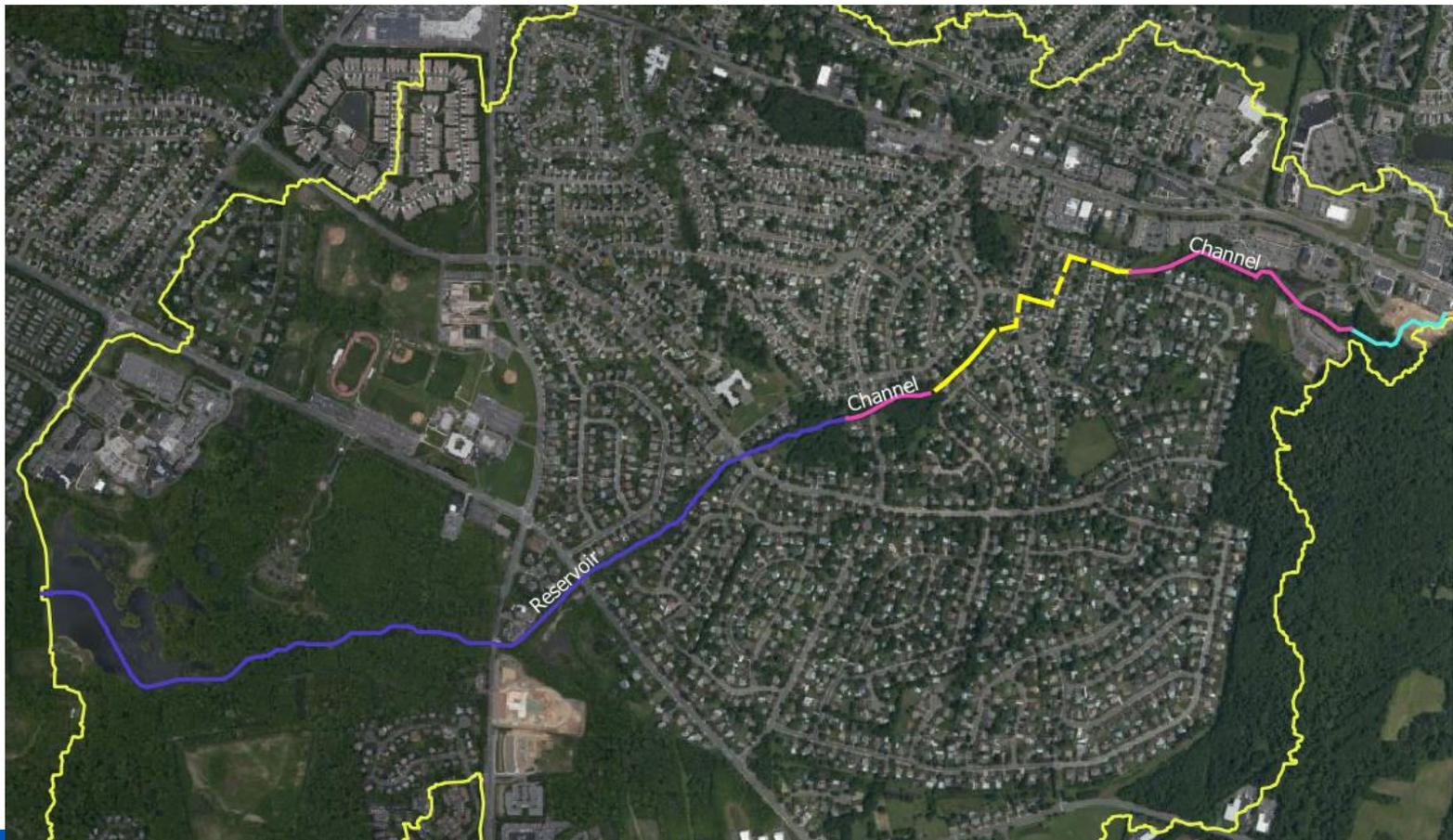
Runoff Curve Numbers

- Reanalyzed for existing conditions and future buildout (based on zoning restrictions) and using most recent soils data



Time of Concentration

- Reanalyzed using best available terrain data



Updated H&H Analysis

- There is flow in the auxiliary spillway during the 10-day, 100-year storm event and 85% of the flood storage is not evacuated in less than 10 days.
- The auxiliary spillway breaches during the design event
- The dam **IS NOT** overtopped

Sedimentation in the Reservoir

- Bathymetric Survey completed in December 2019
- Estimated future sedimentation rate = 0.3 acre-feet/year
- There is adequate sediment capacity in the normal pool for another 57 years.
- Sediment removal not recommended at this time

Engineering Analyses

Geotechnical Investigation

- Focus Areas
 - Auxiliary Spillway
 - Embankment maximum section along original stream channel
 - Embankment adjacent Principal Spillway
- 8 Borings and 7 Test Pits
- Installed 4 piezometers to monitor seepage
- In situ and laboratory testing of soils



Geotechnical Analyses

Filter Compatibility

- Gravel material of two-stage toe drain filter is too fine to meet current NRCS criteria but meets older criteria
- Repair is not considered warranted at this time
- Recommend routine monitoring of embankment and toe drain outlets for any changes

Seepage

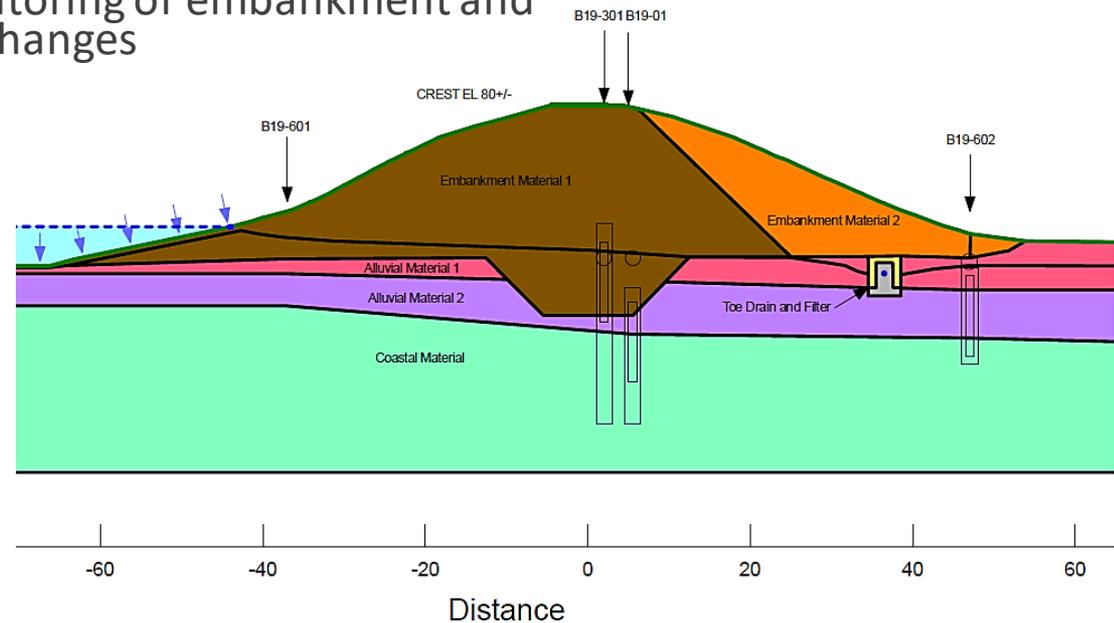
- No issues identified

Static slope stability

- Meets criteria

Seismic Performance

- Meets criteria



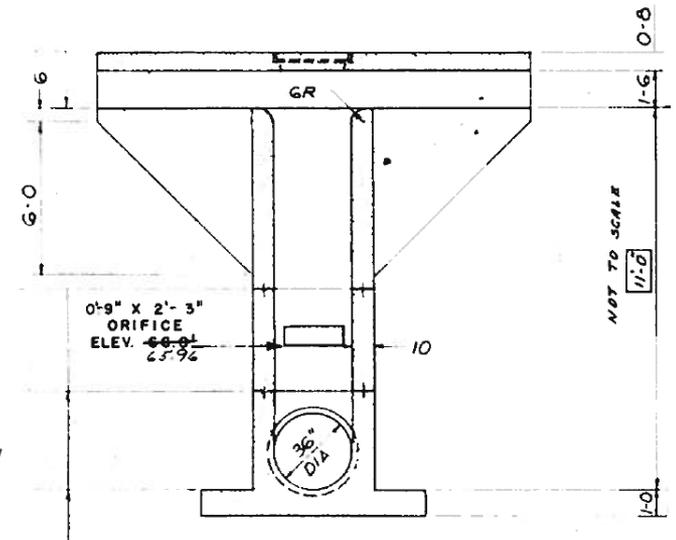
Riser Analysis

- Visual Inspection
 - Observed to be in generally good condition with no observed structural or performance concerns
- Seismic Stability Evaluation
 - Riser meets current design criteria



Loading Condition	Riser in Air	Riser in Water	Required Factor of Safety
Calculated Factor of Safety – Overturning	4.2	3.2	2.0
Calculated Factor of Safety – Sliding	3.7	2.7	1.125

- Recommendations
 - Add a trash rack bar grate system to the low flow orifice on the principal spillway riser





















Turn it over to Wade Biddix

ASW Flow in Monroe County, PA in 2006







Breach of ASW, Granville Dam, MA in 2011

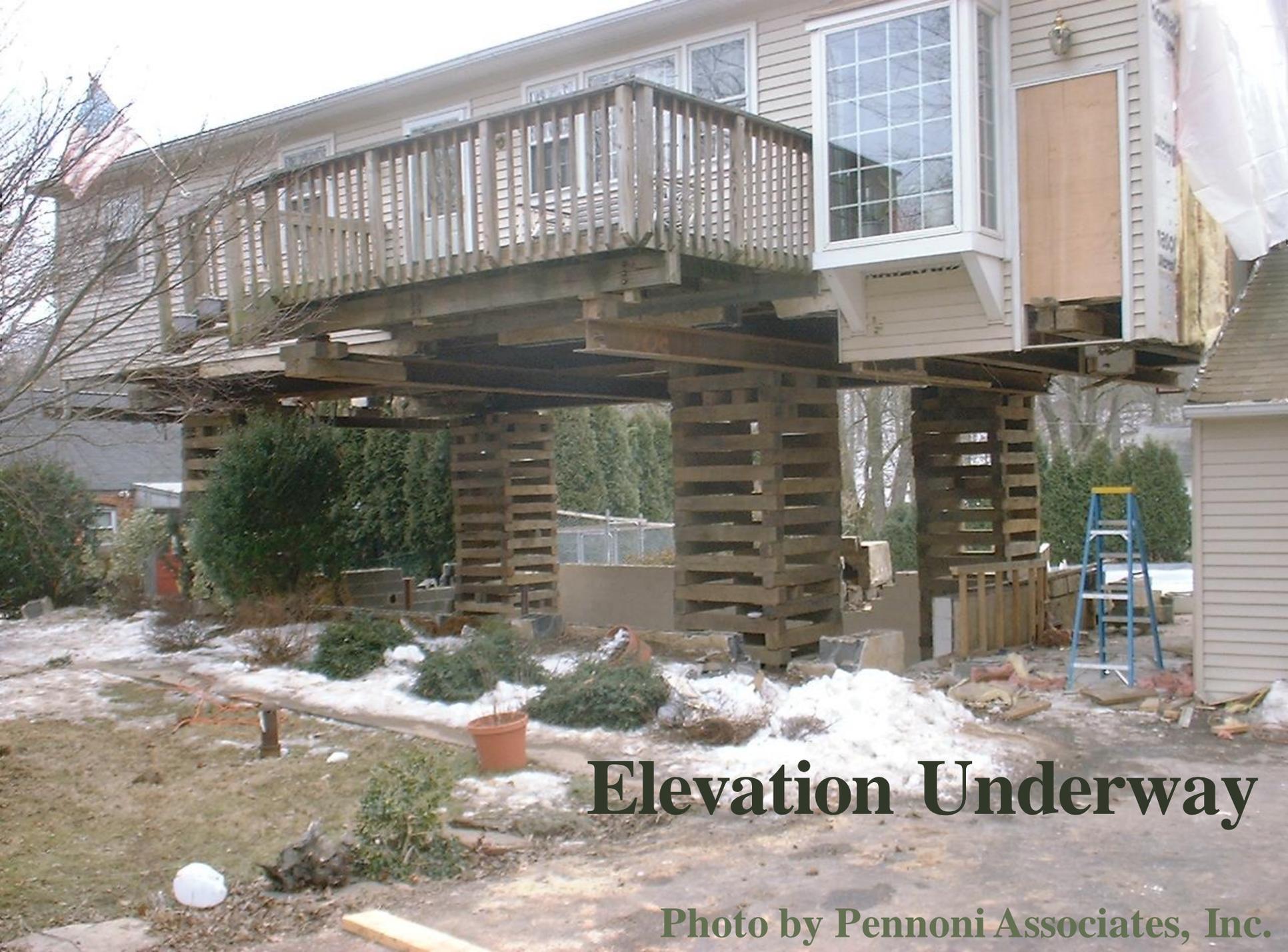


Breach of ASW, Granville Dam, MA in 2011



Alternatives Considered But Eliminated From Detailed Study

- **Raise the Top of Dam and/or Crest of Auxiliary Spillway** – This option didn't make sense because the spillway has capacity to pass the freeboard hydrograph (6-hour Probable Maximum Flood), but it doesn't meet the stability/integrity criteria. Raising the ASW crest or TOD would have negative effect on upstream properties.
- **Decommissioning the Dam** – Includes addressing induced damages to downstream properties, roadways, and crossings. >\$30 Million – eliminated for exorbitant cost.
- **Nonstructural** – 916 buildings to elevate, floodproof and/or relocate downstream of the dam and elevating/modifying 64 roadways and 8 stream crossings. Estimated cost = \$220 - \$230 million.
- **Articulated Concrete Blocks (ACBs) in the existing auxiliary spillway** – Dam doesn't meet the criteria for flood storage and principal spillway capacity, which would require raising of the ASW crest. This requirement can be waived for structural spillways; however, ACBs cannot be considered a structural solution in this situation by NRCS policy.



Elevation Underway

Photo by Pennoni Associates, Inc.

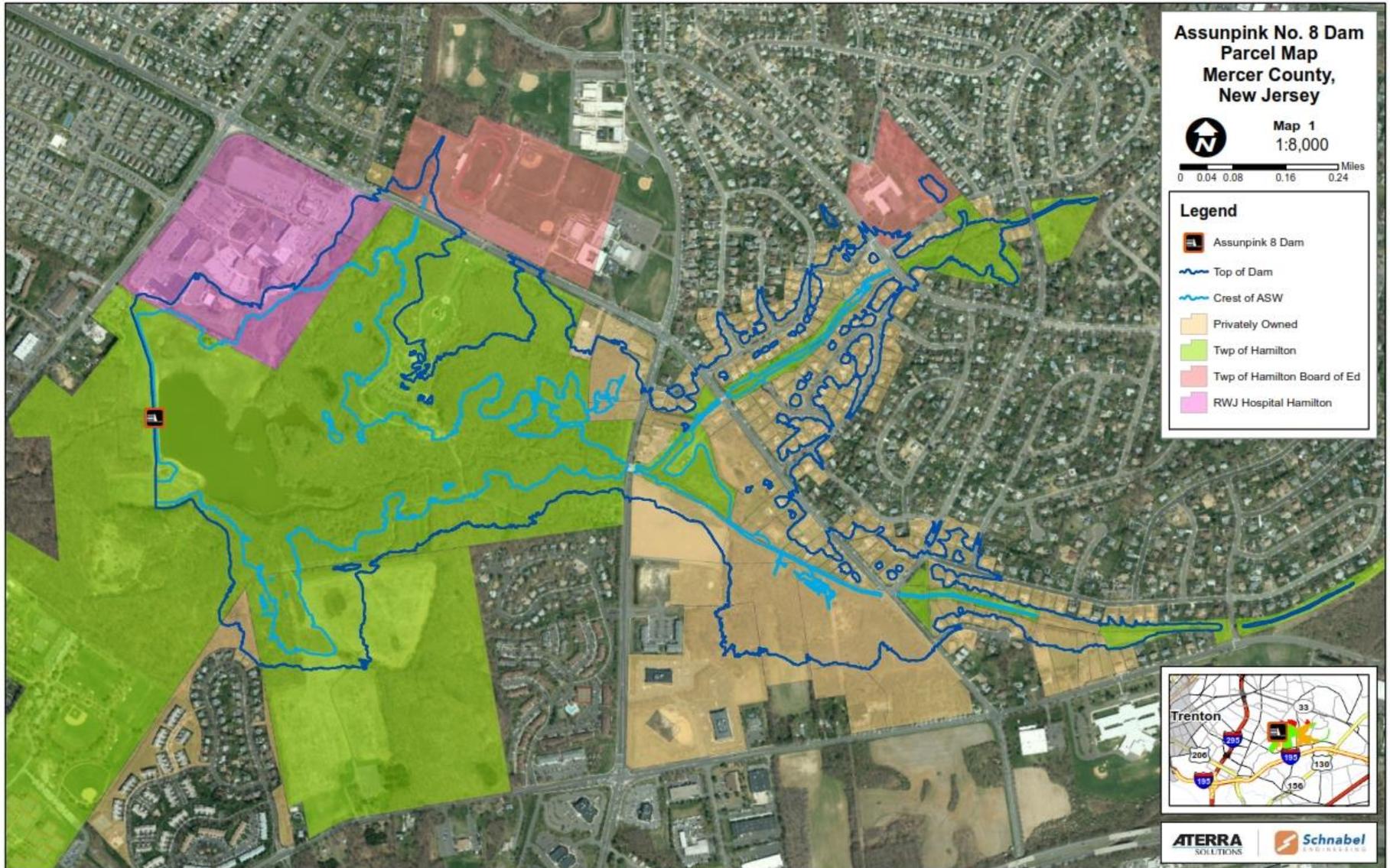


Elevation Completed

4/23/2003

ACBs Conform to Contours in Landscape





Landrights / Easement Issues

- For original construction in 1967, the Town purchased land or secured flood easements to the crest of the ASW elevation = 73.0 feet.
- A floodpool risk analysis was performed for all areas below the top of dam elevation.
 - No floodwater impacts to inhabitable dwellings below the 1,000-year storm.
 - 55 houses, 5 public bldgs., and 2 commercial properties impacted at the top of dam elevation.
- The updated 100-year, 24-hour storm level upstream of the dam was recently determined to be 73.99 feet.
- NRCS policy requires the minimum landrights area upstream of the dam, to be the crest of the ASW elevation or the 100-year, 24-hour storm, whichever is higher. Since the 100-year, 24-hour storm elevation is higher than the current landrights' easements, this would require the Town to acquire 5.86 acres of additional flood easements.
- The Town will decide whether to acquire landrights above the 100-year, 24-hour storm or accept the risk of flooding to the top of dam elevation.

Alternatives Evaluated and Analyzed in Detail

- No Action – No Federal Funding for dam rehabilitation
- Roller Compacted Concrete in Existing Auxiliary Spillway
- Straight Drop Concrete Spillway Over Top of Dam
- Labyrinth Weir Concrete Spillway Over Top of Dam

Conceptual Design of Alternatives



ALTERNATIVE 1 AERIAL IMAGE (1)
SCALE: 1"=40' C-1

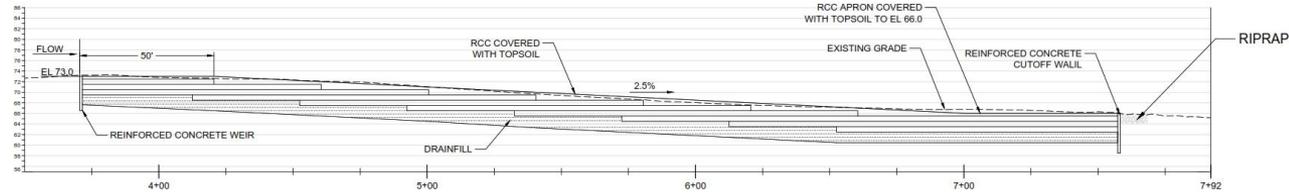


CONCEPTUAL DRAWING -
NOT FOR CONSTRUCTION

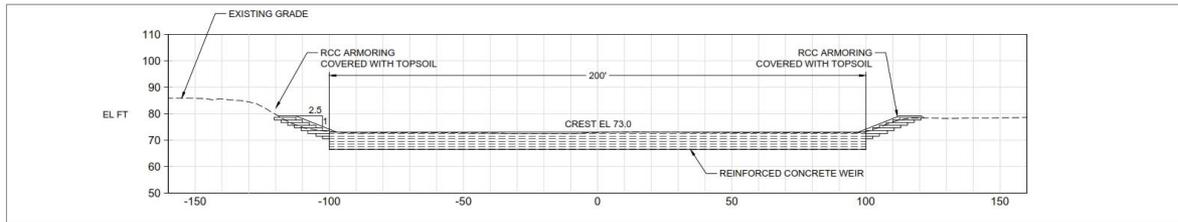
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Approved	6/20/2020
Date	
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Rev.	Description
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300 Brockside Avenue Building 18, Suite 160 Ambler, Pennsylvania 19002	
Drawing No. C-1	
Sheet 2 of 10	

RCC Auxiliary Spillway - Yellow River 14 in GA





ALTERNATIVE 1 PROFILE
HORIZONTAL SCALE: 1"=20'
1
C-3



SECTION A-A
SCALE: 1"=20'
2
C-3

Designed	PM
Drawn	AW
Checked	
Approved	
Date	16/06/2023
Initial Release Description	
Rev	0

ASSUNPINK CREEK WATERSHED
DAM NO. 8
HAMILTON, NEW JERSEY
ALTERNATIVE 1 PROFILE



ATERRA SOLUTIONS
Schnabel ENGINEERS
300 Brookside Avenue
Building 18, Suite 160
Ambler, Pennsylvania 19002

CONCEPTUAL DRAWING -
NOT FOR CONSTRUCTION



ALTERNATIVE 2 AERIAL IMAGE 1
C-4

SCALE: 1"=40'



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ASSUNPINK CREEK WATERSHED
DAM NO. 8
HAMILTON, NEW JERSEY
ALTERNATIVE 2 AERIAL IMAGE

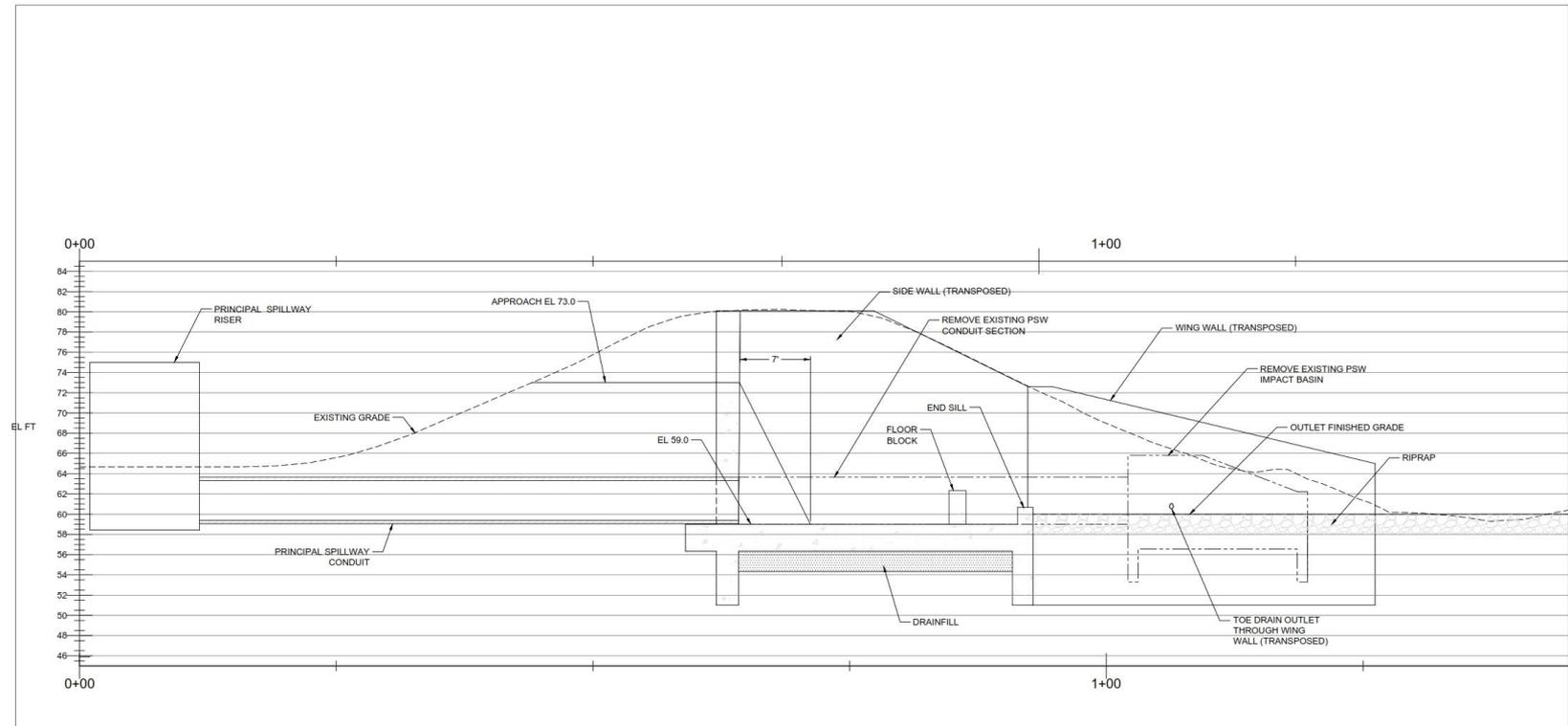


ATERRA SOLUTIONS | **Schnabel** ENGINEERING
300 Proxside Avenue
Building 18, Suite 100
Ambler, Pennsylvania 19002

CONCEPTUAL DRAWING -
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Drawing No.
C-4
Sheet 5 of 10





ALTERNATIVE 2 PROFILE



1
C-6

Designed	PM
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Checked	
Approved	
DATE	
Revised	
INITIAL RELEASE	6/26/2025
Description	

ASSUNPINK CREEK WATERSHED
DAM NO. 8
HAMILTON, NEW JERSEY
ALTERNATIVE 2 PROFILE



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Schnabel PARTNERS
300 Brookside Avenue
Building 18, Suite 160
Ambler, Pennsylvania 19002

CONCEPTUAL DRAWING -
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Drawing No.
C-6
Sheet 7 of 10



ALTERNATIVE 3 AERIAL IMAGE 1
C-7

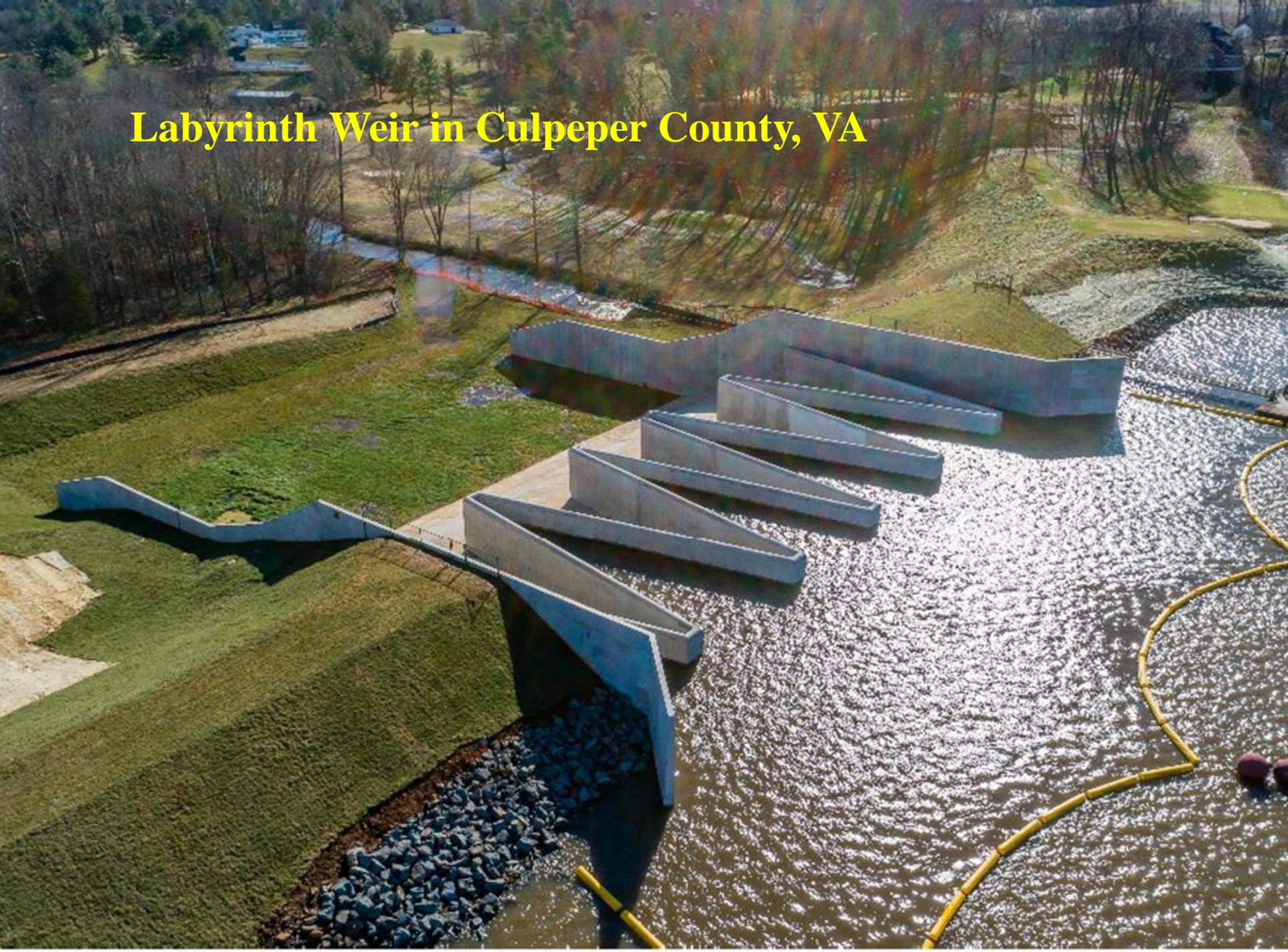
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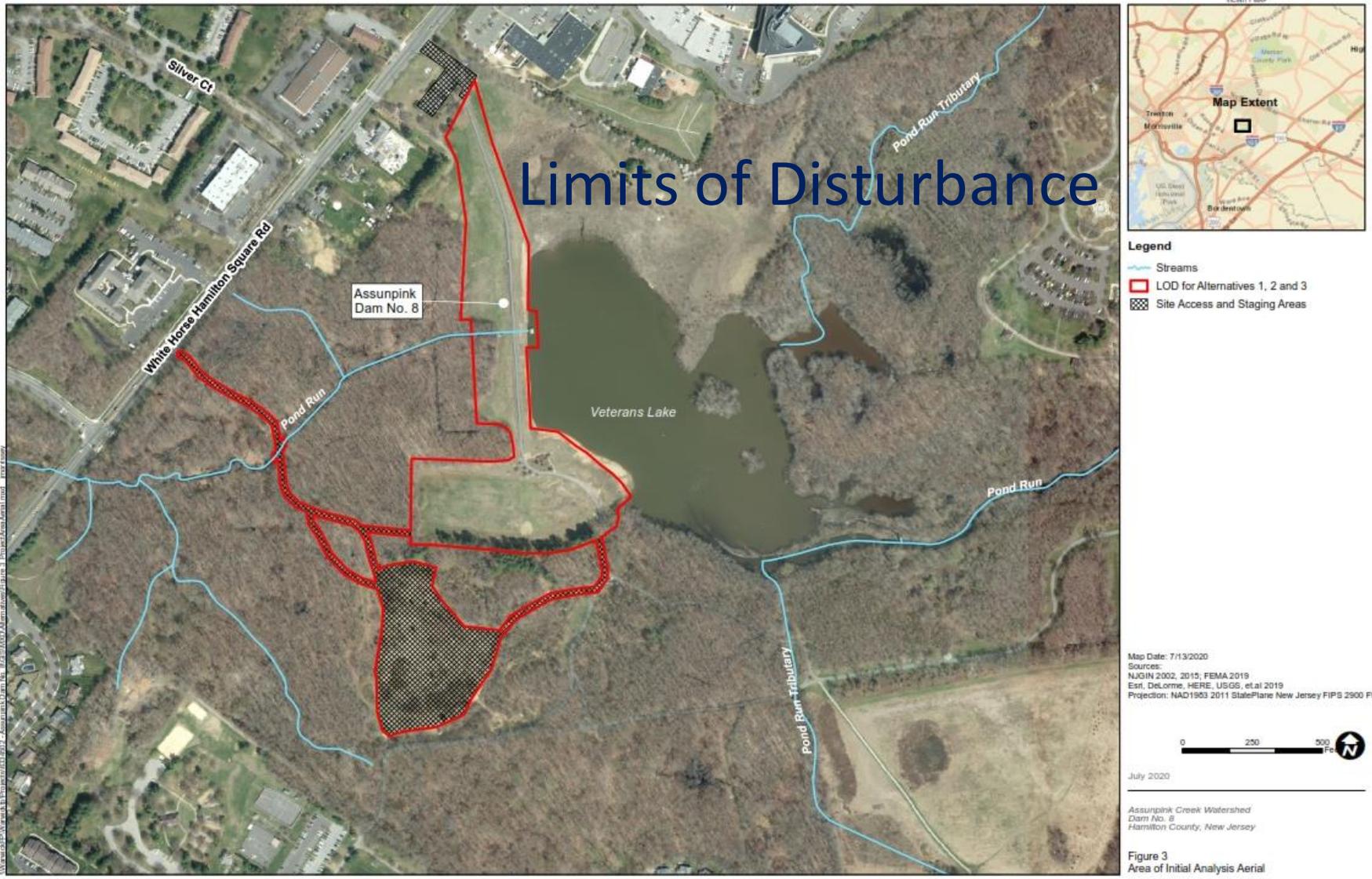


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 United States Department of Agriculture Natural Resources Conservation Service	
 Schnabel ENGINEERING	
300 Brookside Avenue Springfield, PA 19006 Amber, Pennsylvania 19002	
Drawing No. C-7	
Sheet 8 of 10	

Labyrinth Weir in Culpeper County, VA





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Comparison of Alternatives

Alternative Description	Construction Costs in 2020 Dollars
No Action – Town rehab. to NJ state standards at least cost (without federal assistance)	\$3,661,000
RCC in Existing Auxiliary Spillway	\$5,762,000
Drop Spillway over Dam	\$4,918,000
Labyrinth Spillway over Dam	\$3,661,000

Recommended Alternative

Alternative 3 – Labyrinth Weir over the Dam

- The **National Economic Development (NED) Plan** is the federally assisted alternative with the greatest net economic benefits. If the Sponsors want NRCS assistance with rehab., the NED must be the selected alternative unless there is an exception granted by the Chief of NRCS.
- Federal Cost = 65% of Total Project Costs (includes construction costs, engineering, landrights, contract administration, etc.)
- Nonfederal Costs = 35% of Total Project Costs

Environmental Effects/Impacts

Keep in mind that the existing conditions already has a dam onsite. We are modifying the original footprint of the dam. These impacts are changes with a dam in place; not for a new dam.

Resources Located Within the Limits of Disturbance

- Prime Farmland Soils = 2.36 acres
- Farmland of Statewide Importance = 7.63 acres
- Wetland Types
 - Freshwater Forested/Shrub = 0.38 acres
 - Lake Wetland and Deep Water = 0.19 acres
 - Riverine Wetland and Deep Water = 0.16
- Recreational Land = 7.72 acres
- Transportation/Communications/Utilities = 2.32 acres

Environmental Effects/Impacts (cont).

Species-Based Habitats Within the Limits of Disturbance

- Rank 5 = Wildlife listed as endangered and threatened (ESA) = 0 acres
- Rank 4 = Habitat for state endangered species = 0 acres
- Rank 3 = Habitat patches for state threatened species = 2.46 acres
- Rank 2 = Habitat patches for species of special concern = 1.66 acres
- Rank 1 = Habitat patches targeted for future wildlife surveys = 6.84 ac.

Environmental Effects/Impacts (cont).

- One known Federally listed Threatened Species (Northern Long-Eared Bat) or its habitat was identified as being present (USFWS IPac).
 - Impacts are likely avoidable with time-of-year restrictions

Considerations During Construction

- Close Parking Lot on White Horse Hamilton Square Road
- Require Access to Both Sides of Dam
- Utilize Staging Areas for Equipment and Materials
- Large Trucks on Roads in the Area
- Construction Areas will be closed to public access from about March to November (one construction season)

Overall Planning Schedule

- Evaluation of Alternatives - August 25, 2020
 - Town will accept written comments for 1 month
- Preparation of Supplemental Plan - February 4, 2021
 - Internal Review of Preliminary Plan by Sponsors and NRCS
 - Technical Review of Draft Plan by NRCS Staff in Arkansas
 - Incorporate Comments into Final Plan
 - Signatures and Approvals by Sponsors and NRCS
- Assuming Federal Funding for Implementation:
 - Design takes about 1 year
 - Construction takes about 1 year

We Are Asking For Your Help

- If you have any specific information or data on the watershed or this specific dam, upstream or downstream, adjacent properties, or the embankment, reservoir, etc., please let us know.
- Email or Write by **September 12th** to:
 - Richard Williams, Municipal Engineer
 - Email is rwilliams@hamiltonnj.com
 - Address is P.O. Box 00150, Hamilton, NJ 00150

THANK YOU!

**We appreciate your participation and
your input and assistance with the
development of this rehabilitation plan.**

QUESTIONS AND COMMENTS?

Equal Opportunity Employer and Provider

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