



**Supplemental Watershed Plan  
Agreement No. 10  
for  
Neshaminy Creek Watershed  
Core Creek Dam (PA-620)  
Bucks County, Pennsylvania**



# Project Authorization

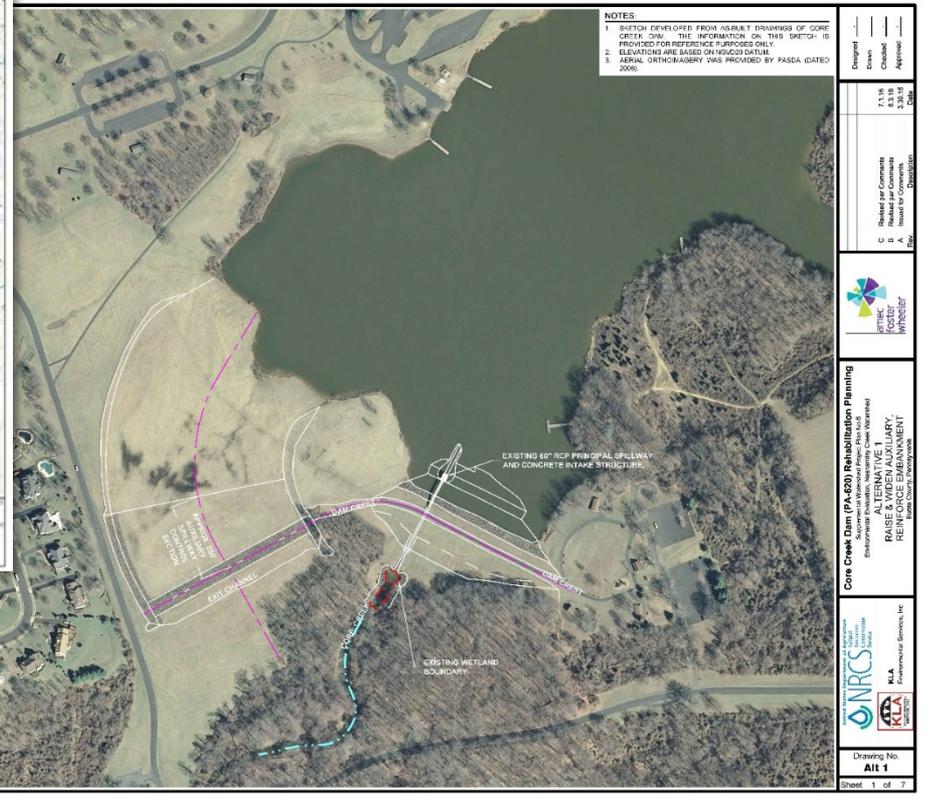
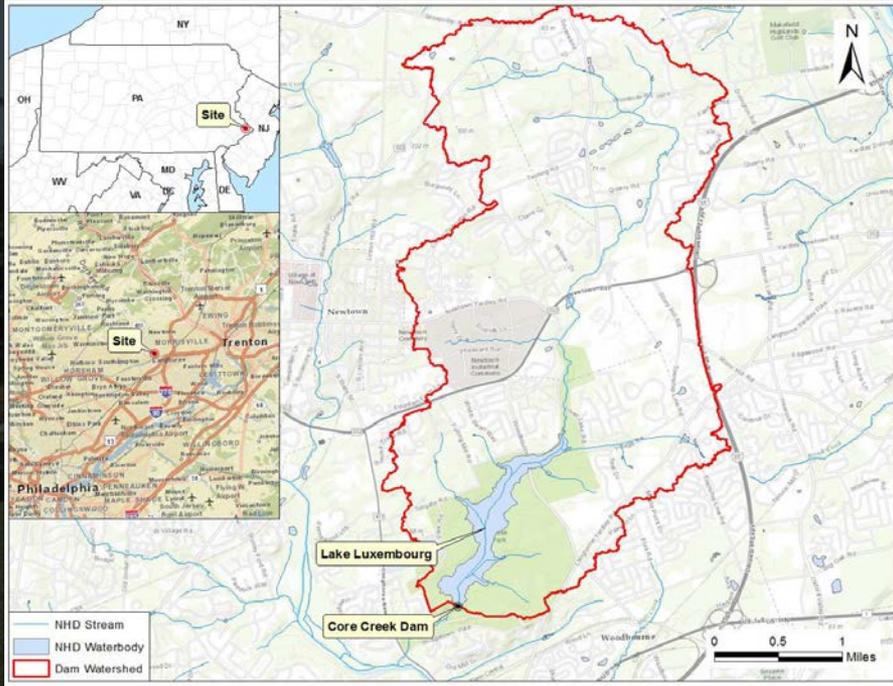
USDA's Small Watershed Program is carried out under the authority of the Watershed Protection and Flood Prevention Act of 1954; Public Law 83-566. The watershed program helps communities meet local resource needs, including:

- Flood protection & Control for agricultural land and urban areas
- Fish and wildlife habitat
- Conservation practices & Water quality improvement
- Irrigation & Water supply
- Water-based recreation & Recreational areas
- Erosion and sediment control

## Project Program

- PL 106-472, the Small Watershed Rehabilitation Amendments of 2000, which amends PL 83-566, Watershed Protection and Flood Prevention Act.

# Project Location





# Project Objectives

- Meet or exceed state and federal dams safety criteria.
- Maintain or enhance the current level of flood protection.
- Maintain or enhance water supply storage.
- Maintain the current recreation opportunities.
- Maintain aquatic wildlife and terrestrial wildlife habitat.



# Project Purpose

- Maintain or improve the current level of flood damage reduction provided by the Core Creek Dam (PA-620) for public safety, bridges, roads, agricultural and other lands, buildings, structures, infrastructure, and other features.
- Maintain or improve the recreational and habitat values of Lake Luxembourg and adjacent riparian lands.
- Comply with current applicable design, performance and safety criteria for High Hazard Class dams.
- Maintain the water supply availability provided by the Core Creek Dam and Lake Luxembourg.



# Project Need

- Continue providing flood damage reduction downstream from the dam and address applicable NRCS and Commonwealth of Pennsylvania standards and design criteria for public health and safety to reduce the risk of loss of human life.
- Continue supporting and improving the recreational uses and aquatic and terrestrial wildlife habitat directly dependent upon Lake Luxembourg and its surrounding riparian lands.
- Continue providing public water supply availability from Core Creek Dam and Lake Luxembourg.



# Rehabilitation Planning Process

- Local input
  - Sponsor determines objectives
  - Public scoping meetings
  - Establish problems and opportunities
- Detailed planning study
  - Topographic Surveys
  - Habitat assessments
  - Sediment study
  - Dam safety inspection
  - Engineering analysis of structure and appurtenances
  - Hydrologic and hydraulic modeling
  - Water supply reviews
  - Consideration of breach inundation studies
  - Formulate alternatives
  - Review local input



# Alternatives Considered

- 1) No Action/Future without Federal project
- 2) Federal decommissioning with other downstream measures
- 3) **Rehabilitate dam to NRCS High Hazard Class Dam design criteria**
- 4) Relocate the downstream structures potentially impacted
- 5) Floodproof downstream structures potentially impacted



# Goals for Rehabilitation

- Rehabilitate the dam to current NRCS High Hazard Class dam design criteria.
- Extend the service life for at-least an additional 50 years.
- Enhance the current water supply storage.
- Comply with PA-DEP dam safety regulations.



# Rehabilitation Alternatives

Feature	Existing Condition	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
Top of Dam Elevation (feet)	118.0	118.0	120.5	119.2	118.0	118.0	118.0	118.0
Maximum Water Surface Elevation (feet)	119.79	117.93	120.44	119.13	117.84	116.79	117.05	116.79
Auxiliary Spillway Crest Width (feet)	550	1,200	550	800	550	550 <sup>A</sup>	430 <sup>B</sup>	550 <sup>C</sup>
Auxiliary Spillway Crest Elevation (feet)	111.9	113.2	113.2	113.2	110.5	112.9	112.9	112.8
Principal Spillway Conduit Length (feet)	224.3	280.0	295.0	288.0	280.0	280.0	315.0	280.0
Estimated Percent of Least Cost Alternative	N/A	655%	123%	226%	144%	100%	203%	156%

<sup>A</sup> Alternative 5 uses a labyrinth weir to provide a total crest length of 2,229 feet within the actual spillway width of 550 feet.

<sup>B</sup> Alternative 6 uses a labyrinth weir to provide a total crest length of 2,540 feet within the actual spillway width of 430 feet.

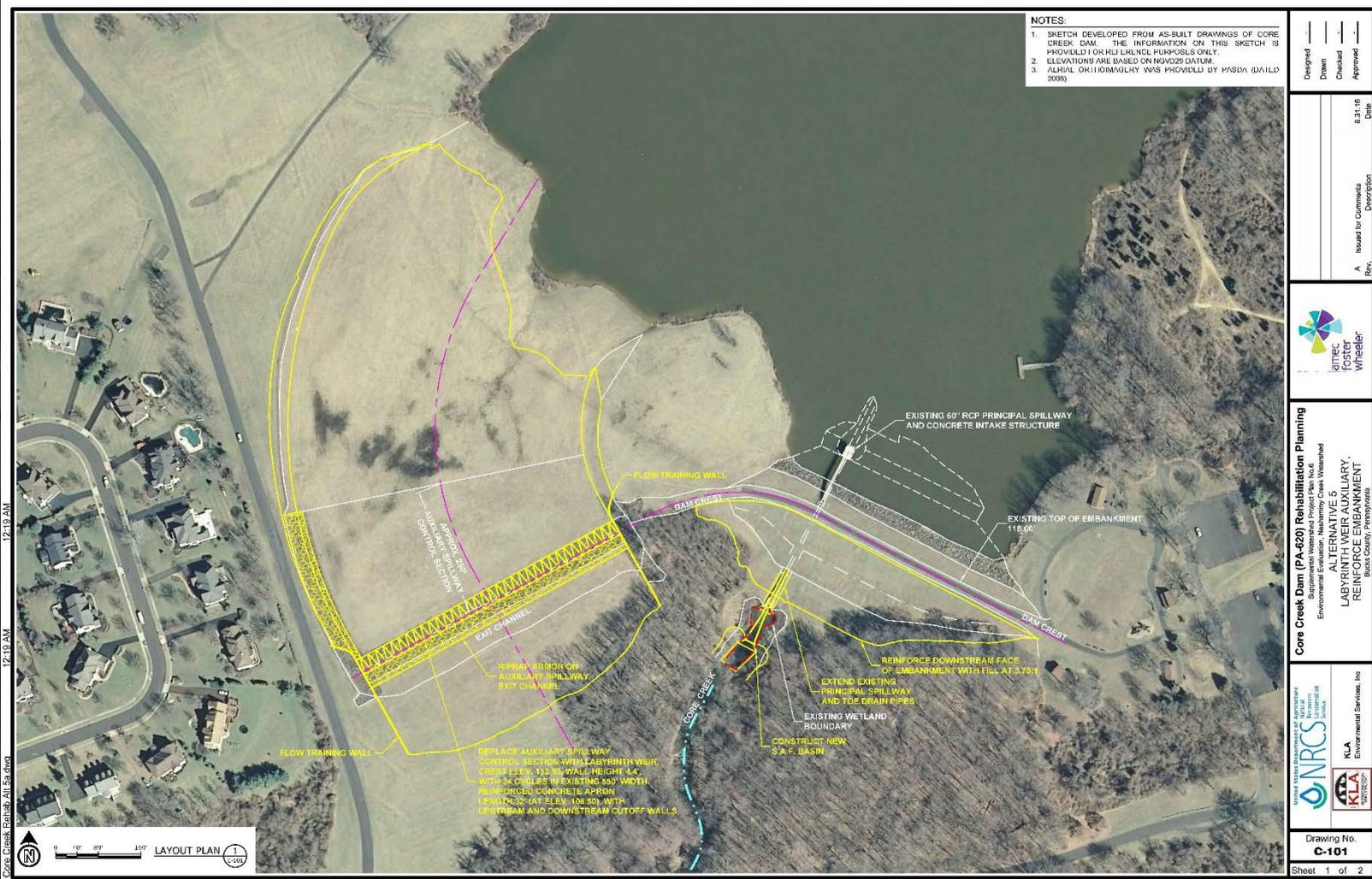
<sup>C</sup> Alternative 7 uses Fusegate® (labyrinth style) to provide a similar flow capacity to a labyrinth weir option. The maximum WSEL is estimated based on the design for the Alternative 5 labyrinth weir. A more detailed design could be prepared in the future with the consultation of the Fusegate® manufacturer, Hydroplus.



# Rehabilitation

- Maintain existing dam at current location and crest Elevation 118.0.
- Extend the service life for an additional 57 years.
- Replace the Auxiliary Spillway control section with a labyrinth weir.
- Armor the Auxiliary Spillway downstream of the labyrinth weir with roller compacted concrete.
- Construct an upstream cutoff wall, downstream scour protection, and a riprap apron.
- Reinforce the downstream face of the embankment with fill at 3.75H:1V slope.
- Extend the existing Principal Spillway conduit and the existing toe drain conduits.
- Construct a new S.A.F. Basin at the outlet of the Principal Spillway conduit.

# Rehabilitation



**NOTES:**  
 1. SKETCH DEVELOPED FROM AS-BUILT DRAWINGS OF CORE CREEK DAM. THE INFORMATION ON THIS SKETCH IS PROVIDED FOR PRELIMINARY PURPOSES ONLY.  
 2. ELEVATIONS ARE BASED ON NGVD25 DATUM.  
 3. ALTHOUGH DIMENSIONALITY WAS PROVIDED BY PMSB (LX14L 2008).

Designed	Checked	Date
Drawn	Approved	
Issue for Comments	Issue for Construction	8.31.16
Rev.	Description	
A		



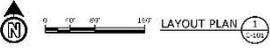
**Core Creek Dam (PA-920) Rehabilitation Planning**  
 Alternative 5  
 LABYRINTH WEIR AUXILIARY  
 REINFORCE EMBANKMENT  
 Boss County, Mississippi



Drawing No. **C-101**  
 Sheet 1 of 2



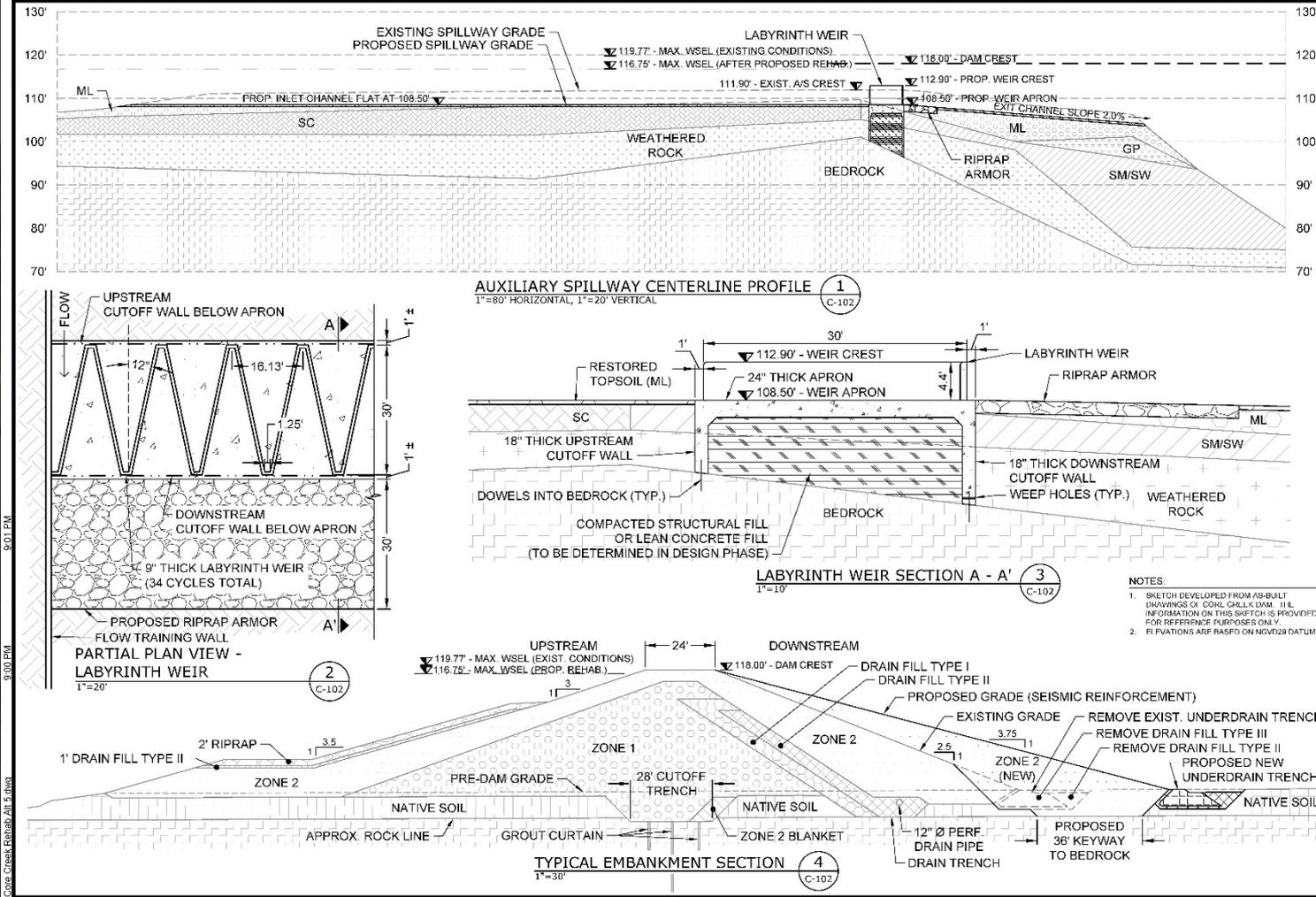
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Core Creek Rehab All 5a.dwg



LAYOUT PLAN 1



# Rehabilitation



Designed	Checked	Approved
Drawn		
S.S. 1/16		
EBS		
A. Issue for Comments		
Description		
Rev.		



**Core Creek Dam (PA-620) Rehabilitation Planning**  
 Environmental Evaluation, Neotoma Creek Watershed  
 ALTERNATIVE 5  
 LABYRINTH WEIR AUXILIARY REINFORCE EMBANKMENT  
 Spots County, North Carolina



Drawing No. **C-102**  
 Sheet 2 of 2



Core Creek Rehab. Alt. 5. sheet



# Rehabilitation to Current High Hazard Class Dam Criteria

Feature	Existing Condition	Alternative 5
Top of Dam Elevation (feet)	118.0	118.0
Maximum Water Surface Elevation (feet)	119.79	116.79
Auxiliary Spillway Crest Width (feet)	550	2,229-foot weir length
Auxiliary Spillway Type	Vegetated Earth	Labyrinth Weir
Auxiliary Spillway Crest Elevation (feet)	111.9	112.9
Principal Spillway Conduit Diameter (inches)	60	60
Principal Spillway Conduit Length (feet)	224.33	280
Principal Spillway Riser Type	Single Stage	Single Stage
Principal Spillway Conduit Type	Reinforce Concrete Pipe	Reinforce Concrete Pipe
Estimated Installation Cost		\$6,187,500



## Preferred Alternative

### Proposal for your consideration:

- Rehabilitate Core Creek Dam (PA-620) to current High Hazard Class dam design criteria.
- Extend the service life for an additional 57 years plus 3 years implementation time.
- Comply with PADEP dam safety regulations.