



Floodplain Restoration along Big Spring Run in Lancaster County, Pennsylvania

PROJECT IMPLEMENTATION PERSPECTIVES

2023 National Stream Restoration Conference
August 22, 2023

Presented by Ben Uhler (LandStudies)
and Bryce Workman (Flyway Excavating)

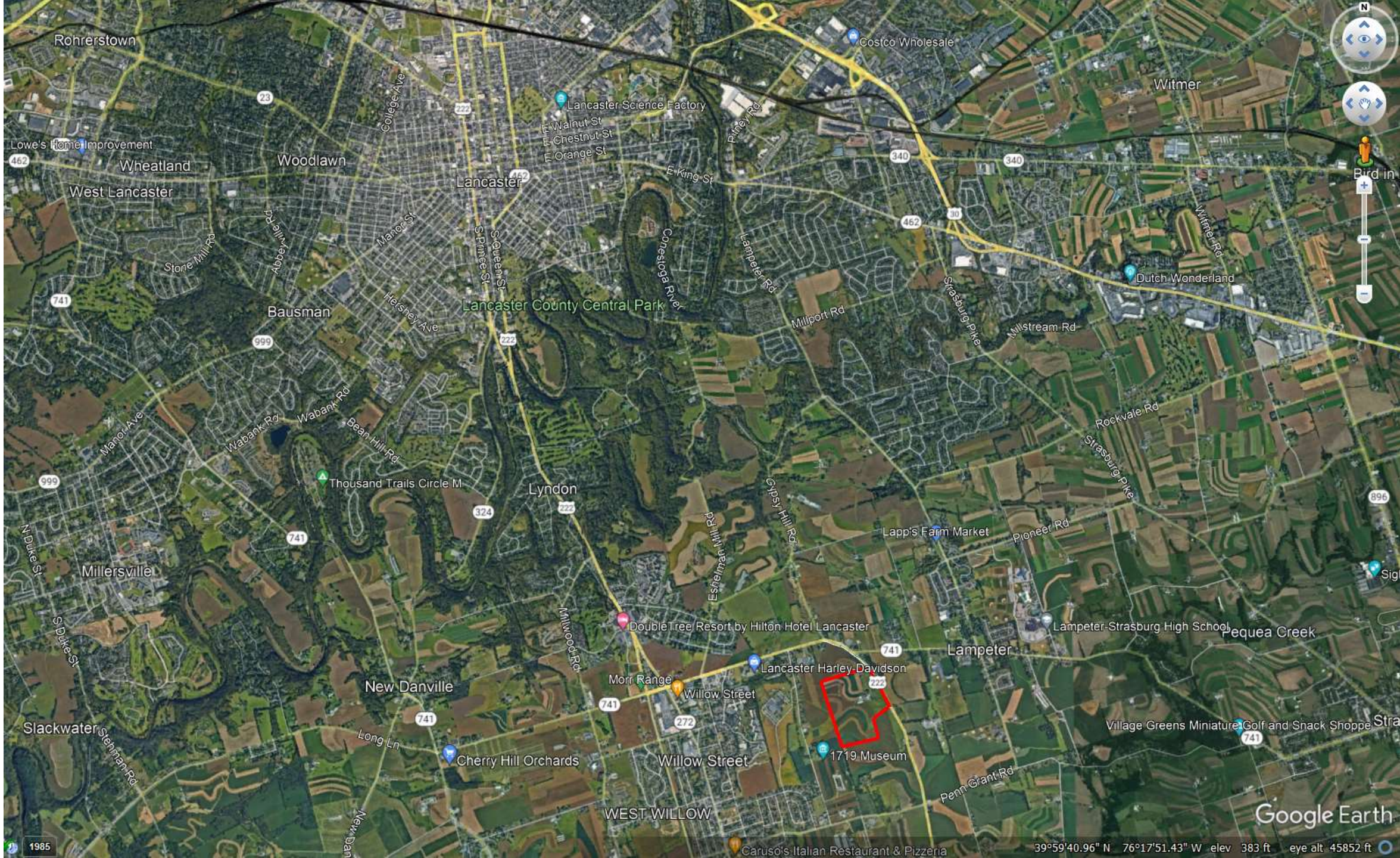




SITE

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
Image NOAA

Google Earth



Rohrerstown

Wheatland

West Lancaster

Woodlawn

Bausman

Millersville

Slackwater

Lancaster

Lancaster County Central Park

Lyndon

New Danville

WEST WILLOW

Cherry Hill Orchards

Willow Street

Caruso's Italian Restaurant & Pizzeria

Costco Wholesale

Lancaster Science Factory

Witmer

Dutch Wonderland

Lapp's Farm Market

Lampeter

Pequea Creek

Village Greens Miniature Golf and Snack Shoppe

Lancaster Harley-Davidson

Double Tree Resort by Hilton Hotel Lancaster

Willow Street

1719 Museum

39°59'40.96" N 76°17'51.43" W elev 383 ft eye alt 45852 ft

Google Earth

1985



Big Spring Run Site - 2011

Big Spring Run – Groff Farm - 2022



Lancaster County Career & Technology Center

Lancaster County Career & Technology Center

Big Spring

Harvest 19

Manor Farm

1719 Museum

Apple Valley

Ishton Ave

Image Landsat / Copernicus

Beaver Valley Pike

Google Earth

39°58'51.14" N 76°15'18.81" W elev 452 ft eye alt 2281 ft

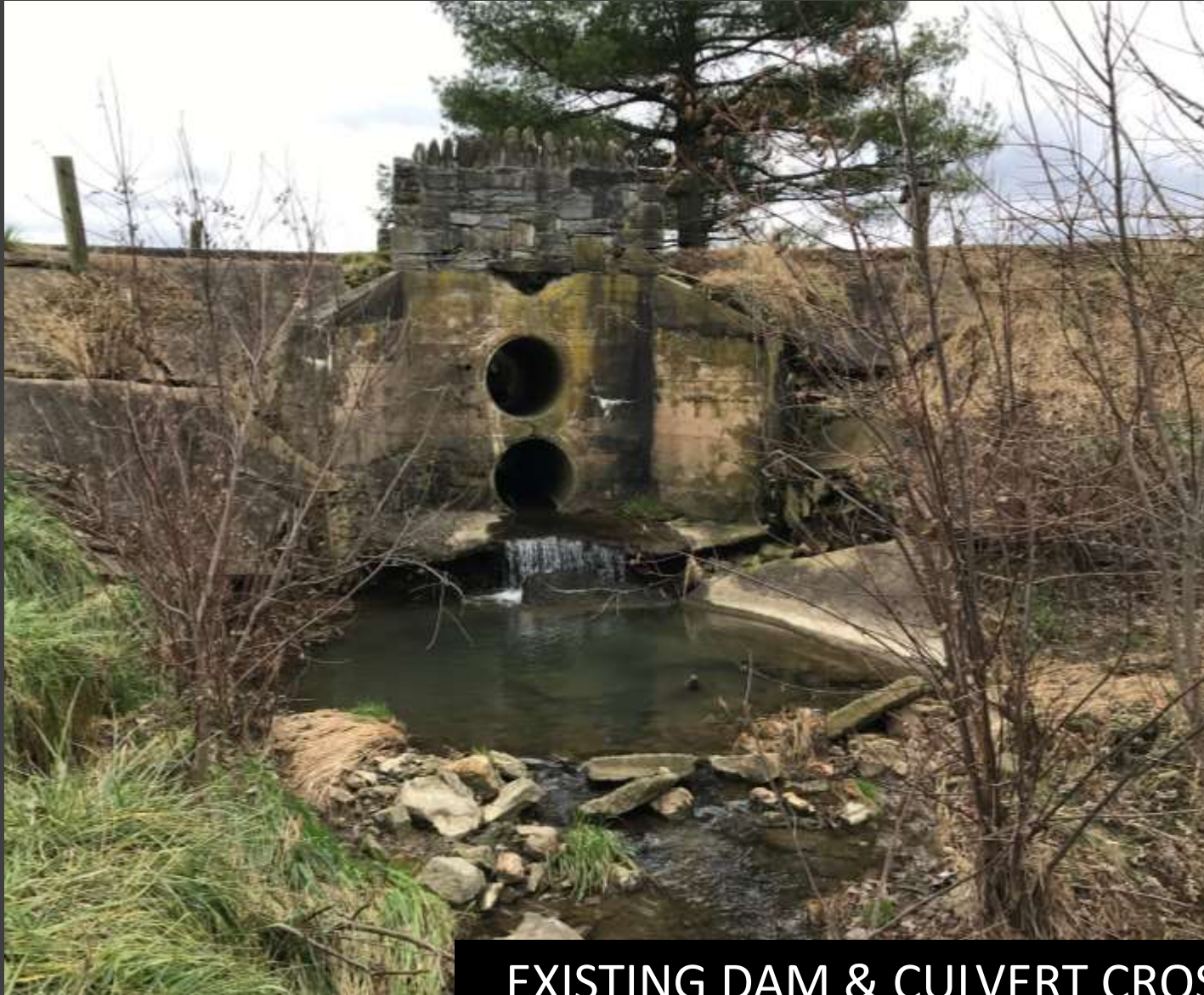
1985



EXISTING CHANNEL INCISION & BANK EROSION



EXISTING CHANNEL INCISION & BANK EROSION



EXISTING DAM & CULVERT CROSSING



Project Goals & Objectives

- Restore Stream / Floodplain
- Remove Dam
- Load Reductions (Sediment, N, P)
- Respect Needs of Landowner

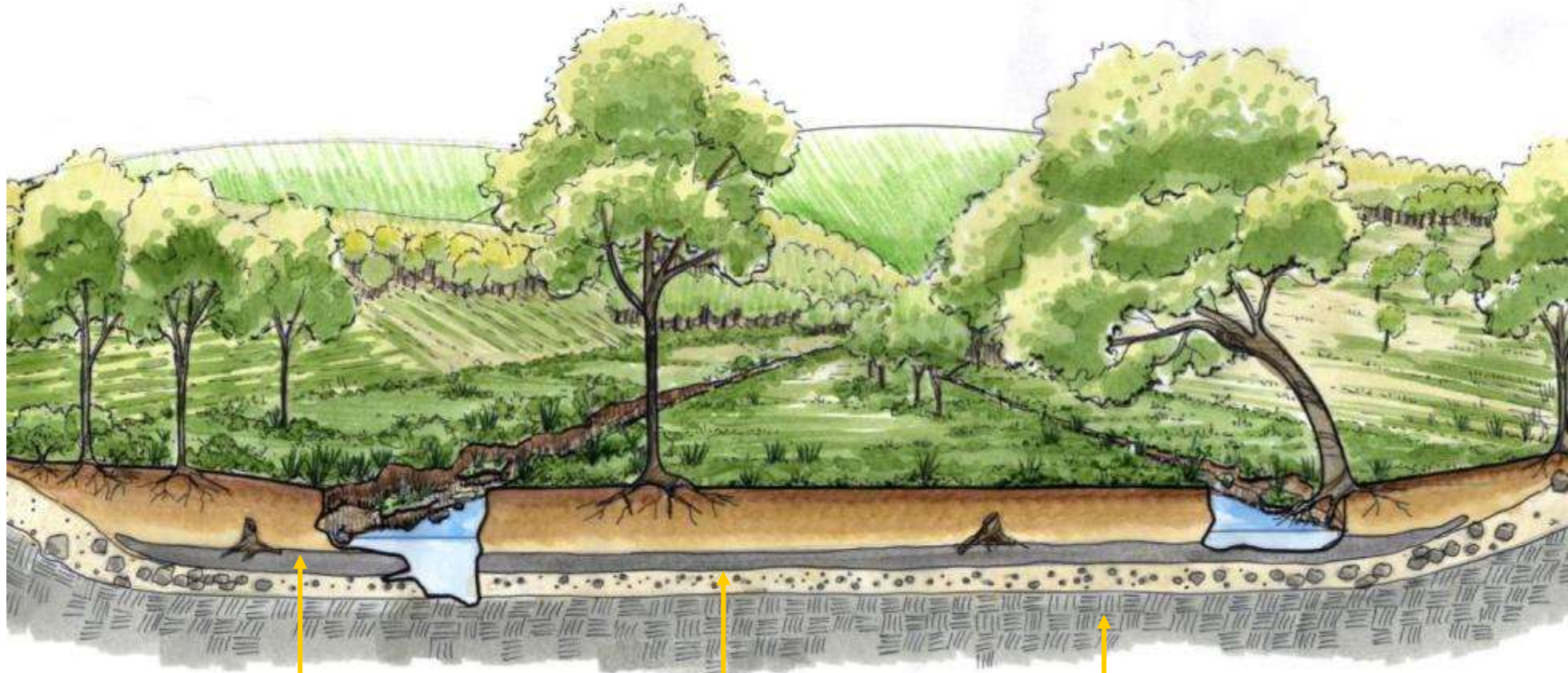
Project History



2014 Feasibility Study and Concept Design

2017 Grant Awarded for Design

Existing Conditions



Historical
Floodplain Soils

Cobble/Gravel Bed

Bedrock

Floodplain Restoration



Roots extend to groundwater

Floodplain Soils – Shallow, Peaty, Organic, & Porous

Cobble/Gravel Bed (Groundwater)

Bedrock

Project History

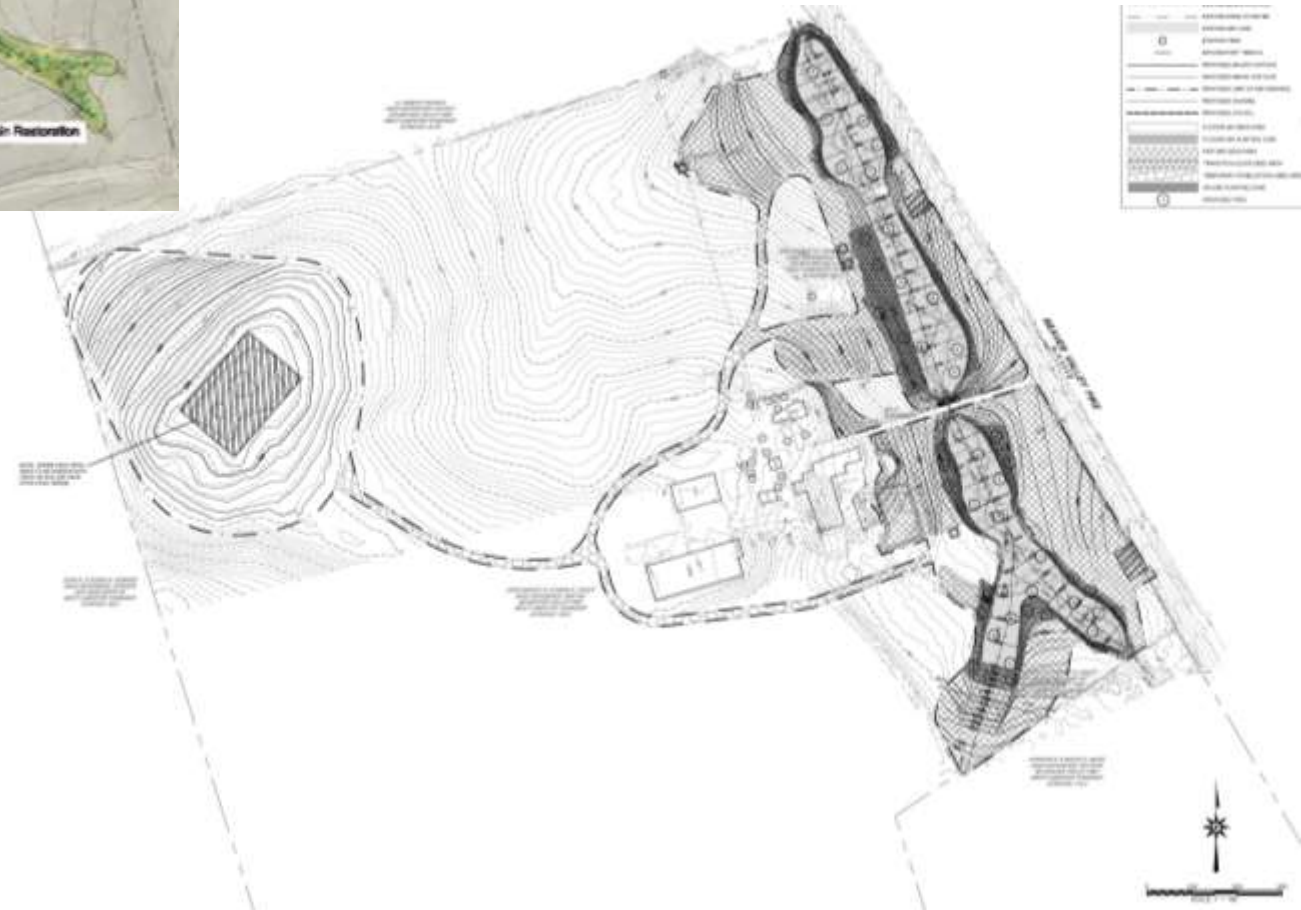


2014 Feasibility Study and Concept Design

2017 Grant Awarded for Design

2019 Design Completed; Permit Authorization

2021 Grants Awarded for Construction



1719 Museum

Project Limits

Image Landsat / Copernicus

Beaver Valley Pike

Google Earth



Constraints

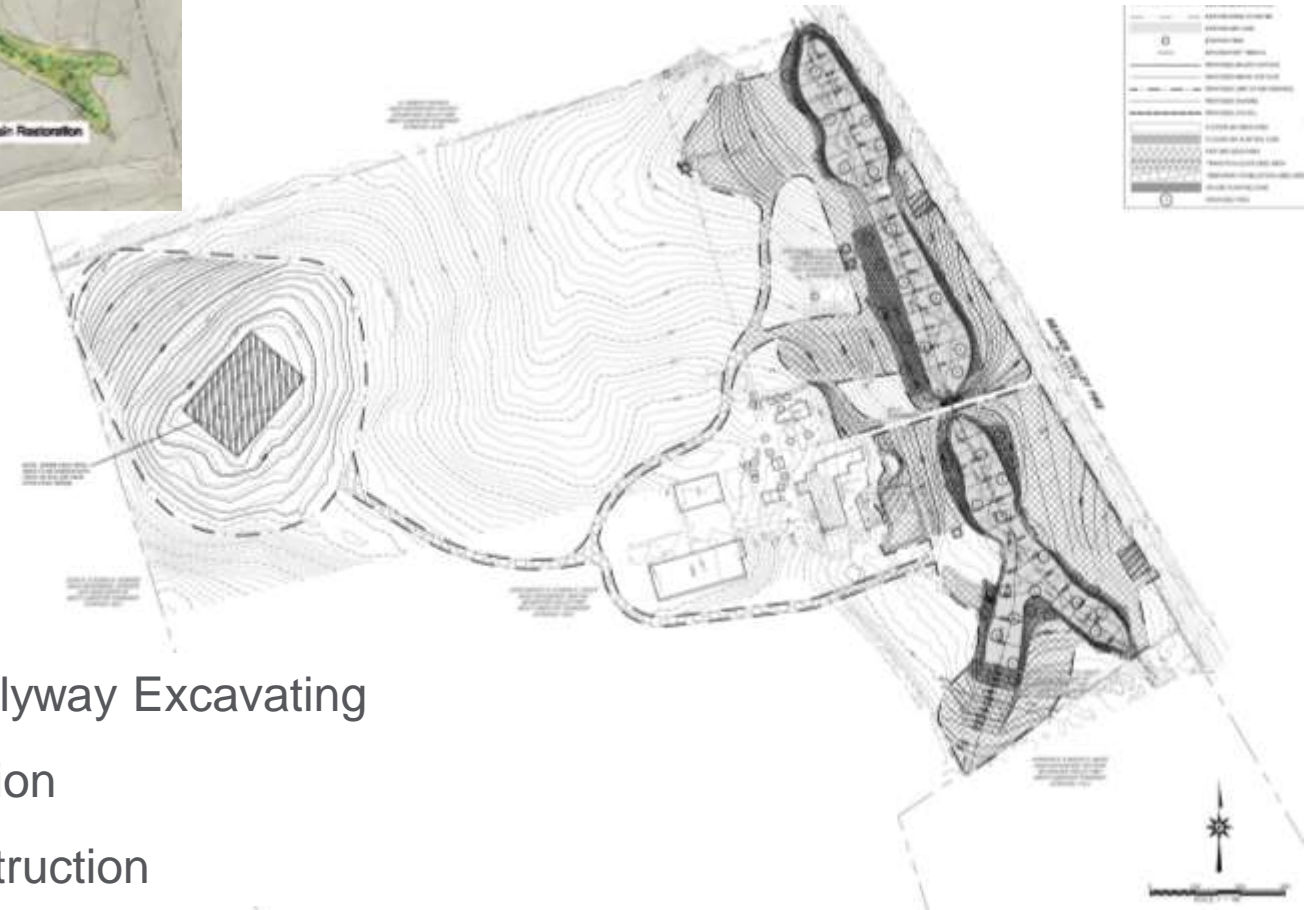
- Driveway Culvert Crossing
- Bedrock
- Tie-Ins
- Active Farm
- Schedule / Timing
- Spoil Area
- Budget
- Weather

Project History



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2021 Grants Awarded for Construction



Jan. 2022 Bid Awarded to Flyway Excavating
Mar. 2022 Began Construction
May 2022 Completed Construction

March 2022





During Construction



During Construction



During Construction





Adaptive Management

- Bedrock Outcropping
- Channel Pattern
- Outfalls / Swales
- Active Farm
- Coordination with Landowner
- Hauling to Spoil Area
- Crop Planting







March 2022



April 2022





After

JULY 2022



JULY 2022



JULY 2022



JULY 2022



JULY 2022



JULY 2022



JUNE 2023



JULY 2022

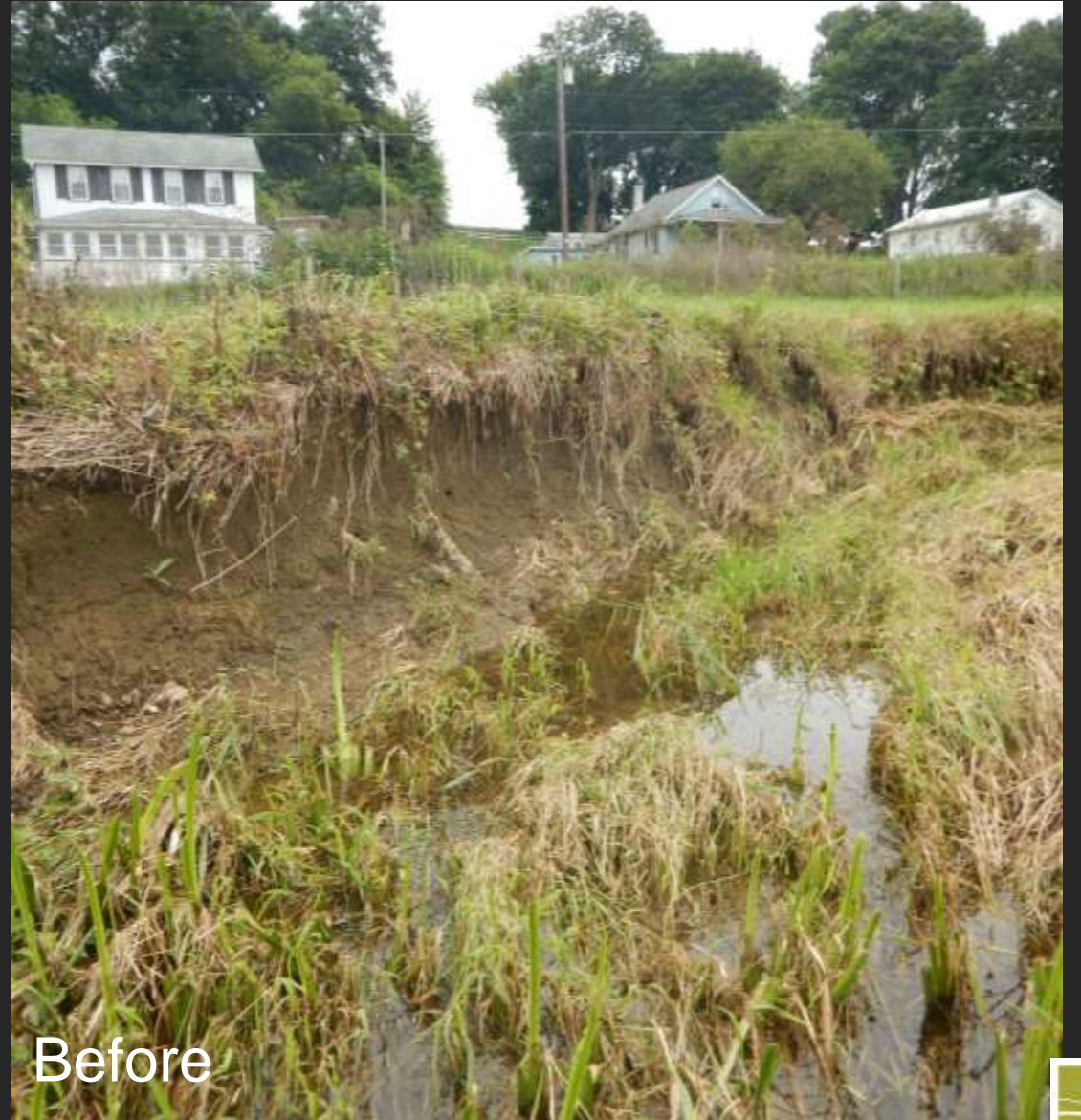


JUNE 2023





After



Before



Before



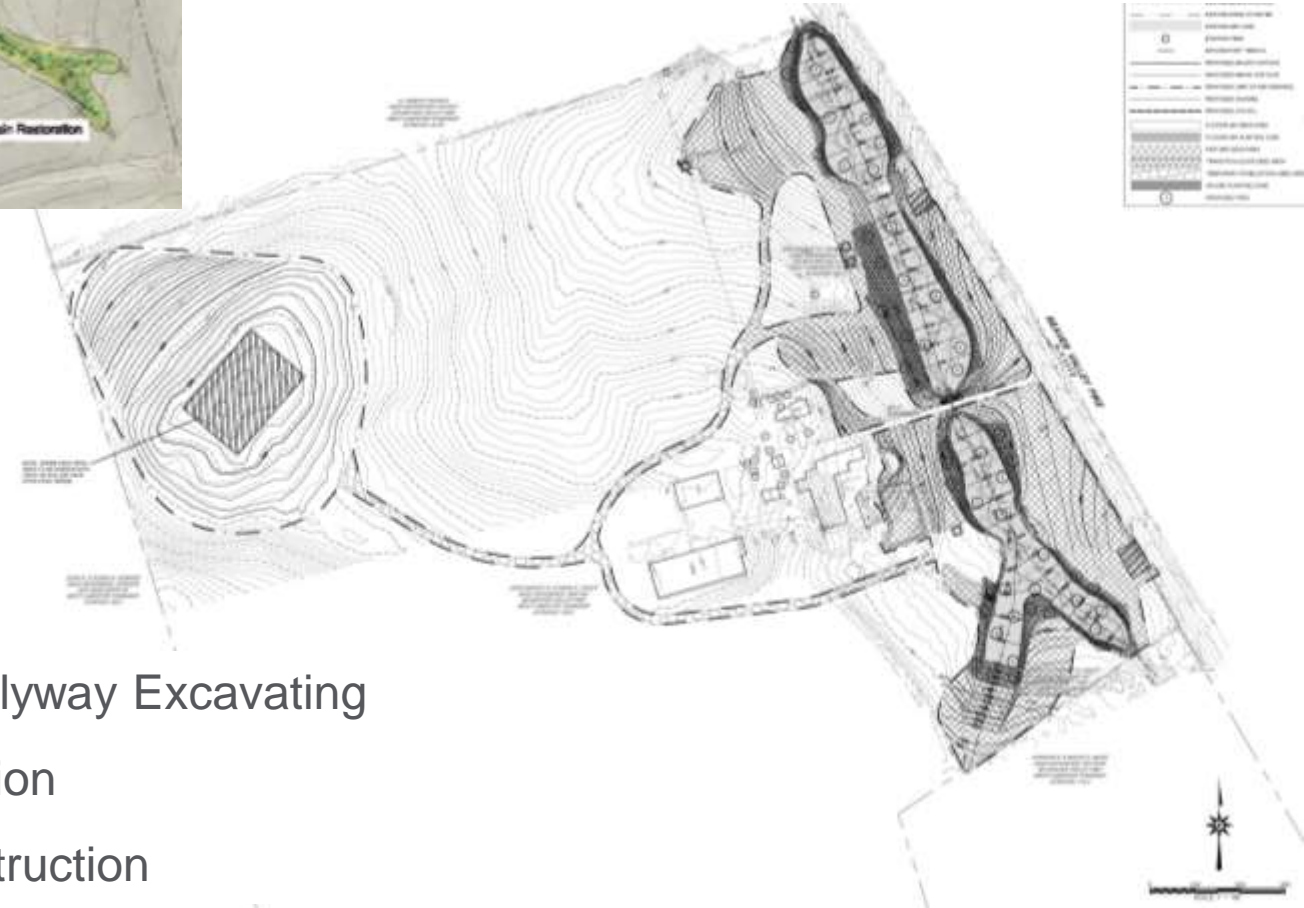
After

Project History



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2022 – 2027

Monitoring and Maintenance



Measurable Results

- Restoration of 2,300 linear feet of Big Spring Run and an Unnamed Tributary (2,000 LF and 300 LF, respectively)
- Restoration of ~ 3.5 acres of riparian wetlands
- Load Reductions:
 - ~ 150 lbs/year Nitrogen
 - ~ 70 lbs/year Phosphorus
 - ~130,000 tons/year Sediment



Successes

- Demonstration of an effective partnership between local municipality, landowners, consultants, contractors, and regulating agencies.
- Eliminated significant source of sediment and nutrients in headwaters of the watershed including retention of incoming sediment from upstream.
- Improved interaction of groundwater / surface water
- Dam removal allows passage of aquatic life
- Restoration of riparian wetlands
- Achieved load reduction goals for West Lampeter Township's MS4 requirements
- Improved aquatic and terrestrial wildlife habitat
- Removal of invasive plant species
- Topsoil generation to improve productivity of cropland
- Reduced maintenance
- Educational opportunities



Keys to Success

- Excellent Cooperation, Communication and Responsiveness
- Proven Design Approach
- Experienced Contractor
- Adaptive Management during Construction
- Supportive / Knowledgeable Landowner



Thank you!

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