Four Mile Run Stormwater Improvement Project Overview

Water & Sewer Authority

PWSA's goal is to improve water quality and to create safe, floodprepared neighborhoods that are healthier places to live.

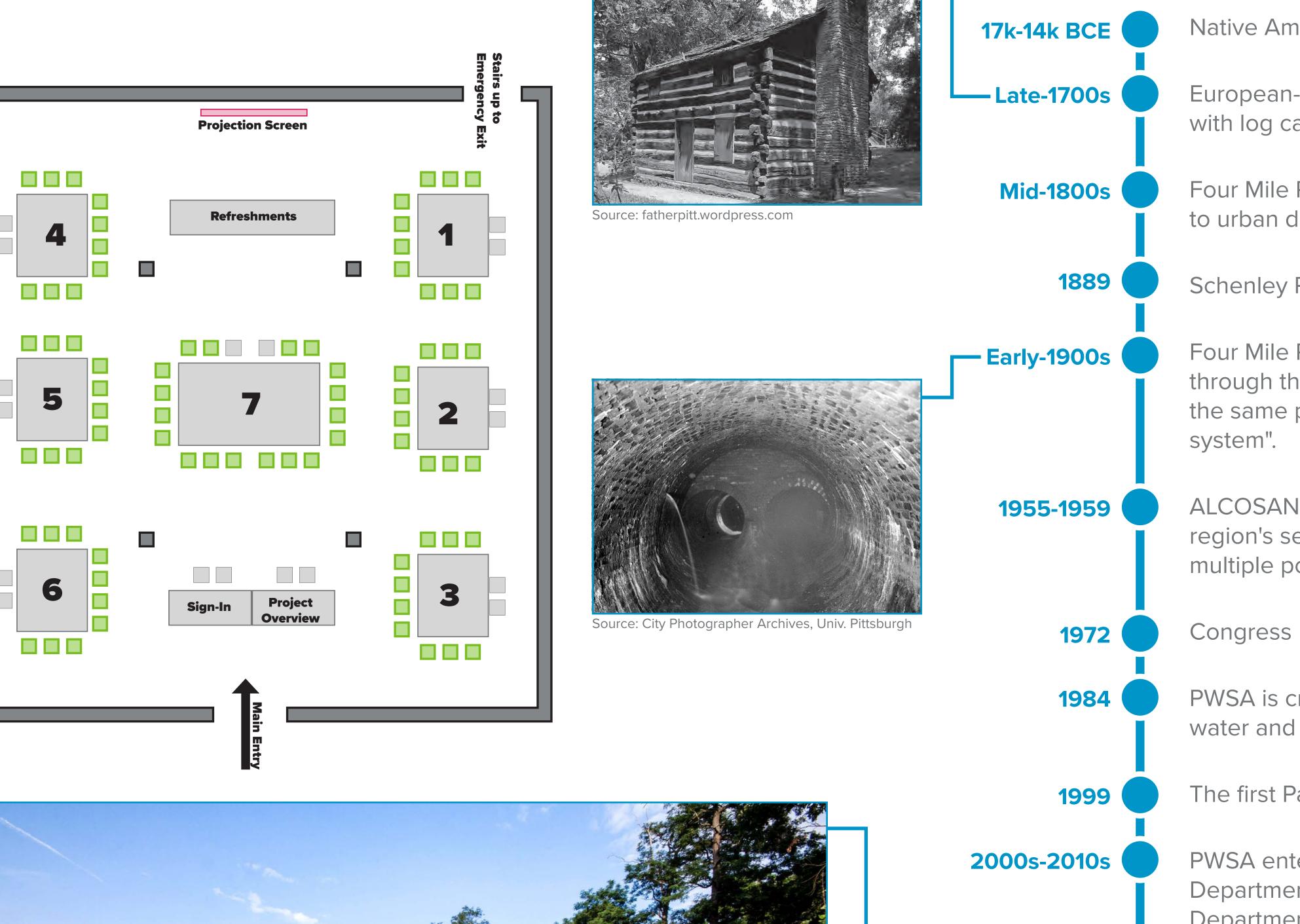
THIS PROJECT IS DESIGNED TO:

- Decrease the risk of flooding, basement sewage backups, and combined sewer overflows (CSOs)
- Control sediment, provide wildlife habitat, and filter pollutants from the stormwater before it enters the river

AT THIS MEETING, WE WILL DISCUSS:

- . Capturing Rainwater in the Neighborhoods
- 2. Panther Hollow Streams
- 3. Panther Hollow Lake
- 4. New Connection Under the Railroad
- 5. New Stream Through Junction Hollow
- 6. Connection and Gateway to Schenley Park
- 7. Connection from The Run to the River







OUR HISTORY AND OUR FUTURE

Native Americans begin to settle in Southwestern Pennsylvania.

with log cabins built in today's Schenley Park.

Four Mile Run's watershed transitions from agricultural

Schenley Park is dedicated as a public park.

region's sewage in dry weather. This system overflows into the river at multiple points when it is overwhelmed by stormwater.

PWSA is created as an independent Authority, gradually taking over

The first Parks Master Plan calls for restoration of the Lake.

2000s-2010s PWSA enters into Consent Order and Agreement with the state Department of Environmental Protection and the County Health

- 2010-2016 Early green stormwater infrastructure projects are implemented in Schenley Park, led by the Pittsburgh Parks Conservancy (PPC).

> PWSA completes its Wet Weather Feasiblity Study identifying Green Stormwater Infrastructure as a solution to CSOs.

 2016 PWSA publishes The Green First Plan which sets a strategy for a network of green conveyance and detention sites throughout

2016-2017 Pittsburgh Parks Conservancy works with PWSA and surrounding communities to develop a stream restoration concept for Four Mile Run.

> PWSA begins preliminary engineering and design for Four Mile Run with a team of stream restoration, urban design, civil engineering,

First Public Meeting about the Four Mile Run Stormwater Improvement

Early 2019 PWSA to begin final engineering and design for Four Mile Run.

PWSA to bid, construct, and commission the Four Mile Run Stormwater Improvement Project, the largest in the Authority's history and an important step for Green Infrastructure in our region. PWSA will keep the community engaged and up to date throughout construction.

1 Capturing Rainwater in the Neighborhoods



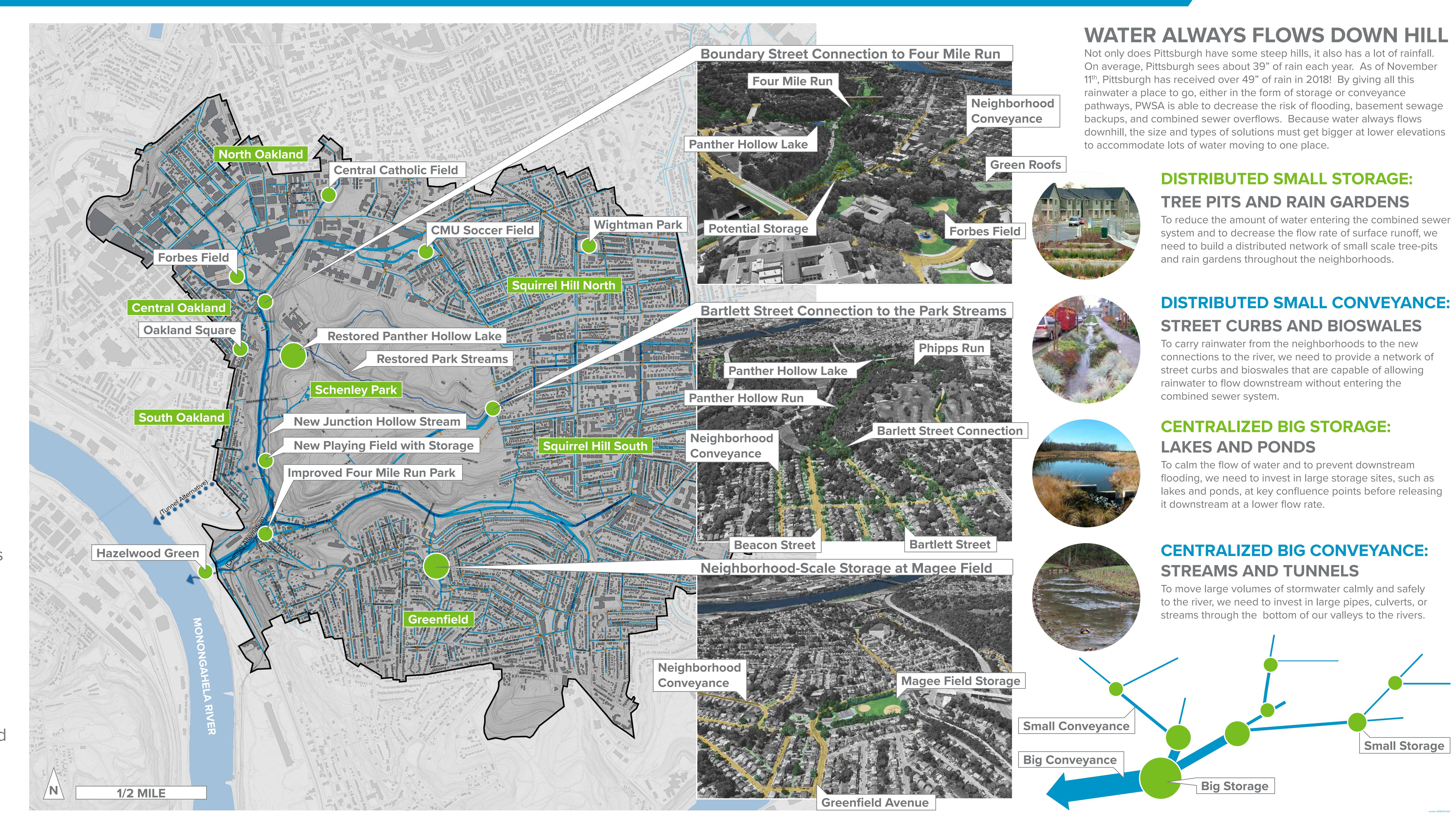
To achieve its goals, PWSA needs to capture rainwater that falls across all of the neighborhoods upstream from Four Mile Run.

WHY ARE WE DOING IT?

- To decrease sewer overflows into the rivers
- To decrease flood risk in downstream communities
- To decrease risk of basement sewage backups

THIS PROJECT WILL...

- Improve the quality of green spaces and parks
- Improve roads and sidewalks in specific locations
- Reduce urban heat island effect by adding more green space
- Improve air quality by adding more green space
- Decrease rainwater in the combined sewer system



2 Panther Hollow Streams

Improved Nature Trail



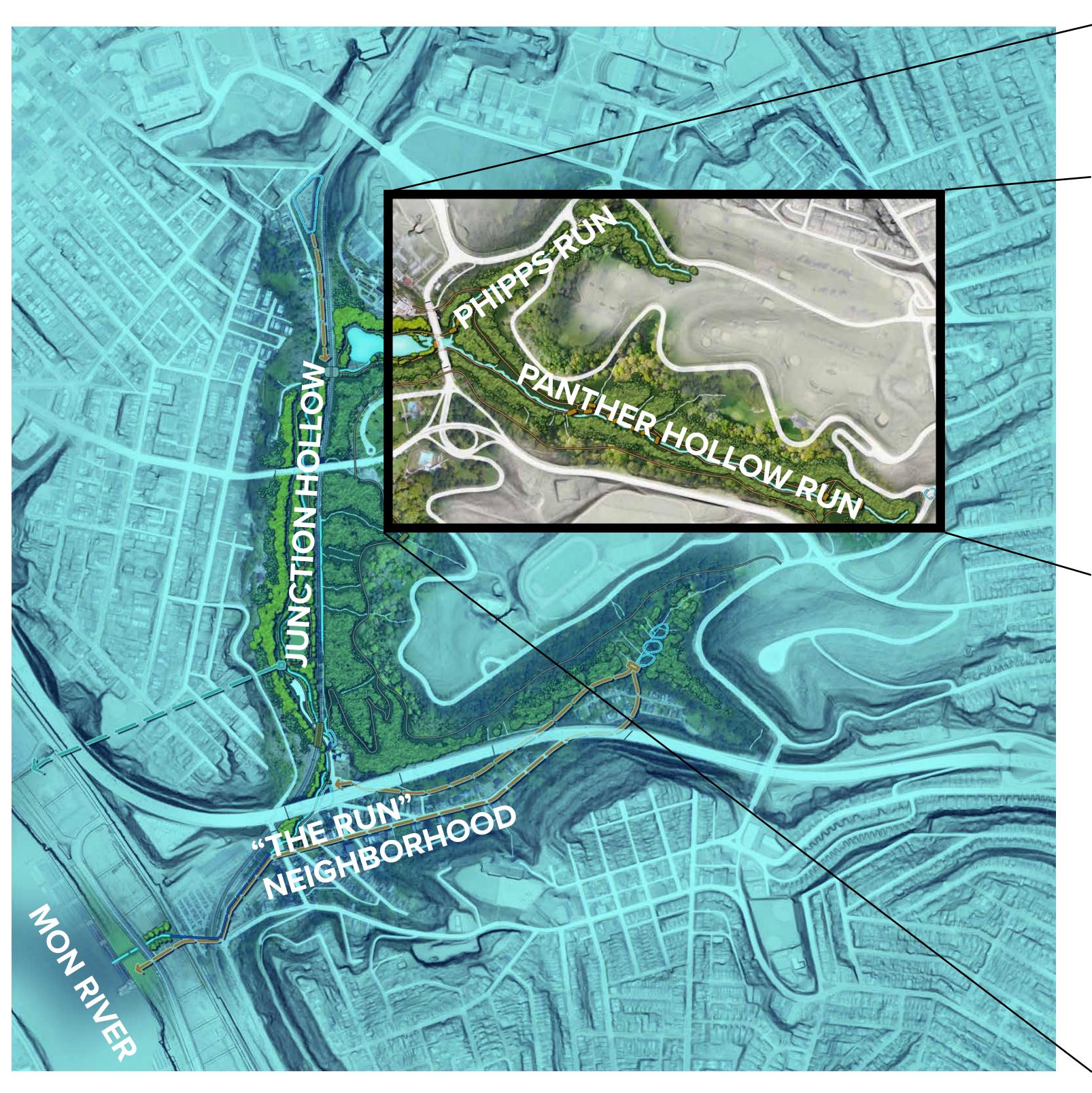
To achieve the project goals, PWSA needs to enhance stormwater conveyance and perform stream bank restoration within Phipps Run and Panther Hollow Run.

WHY ARE WE DOING IT?

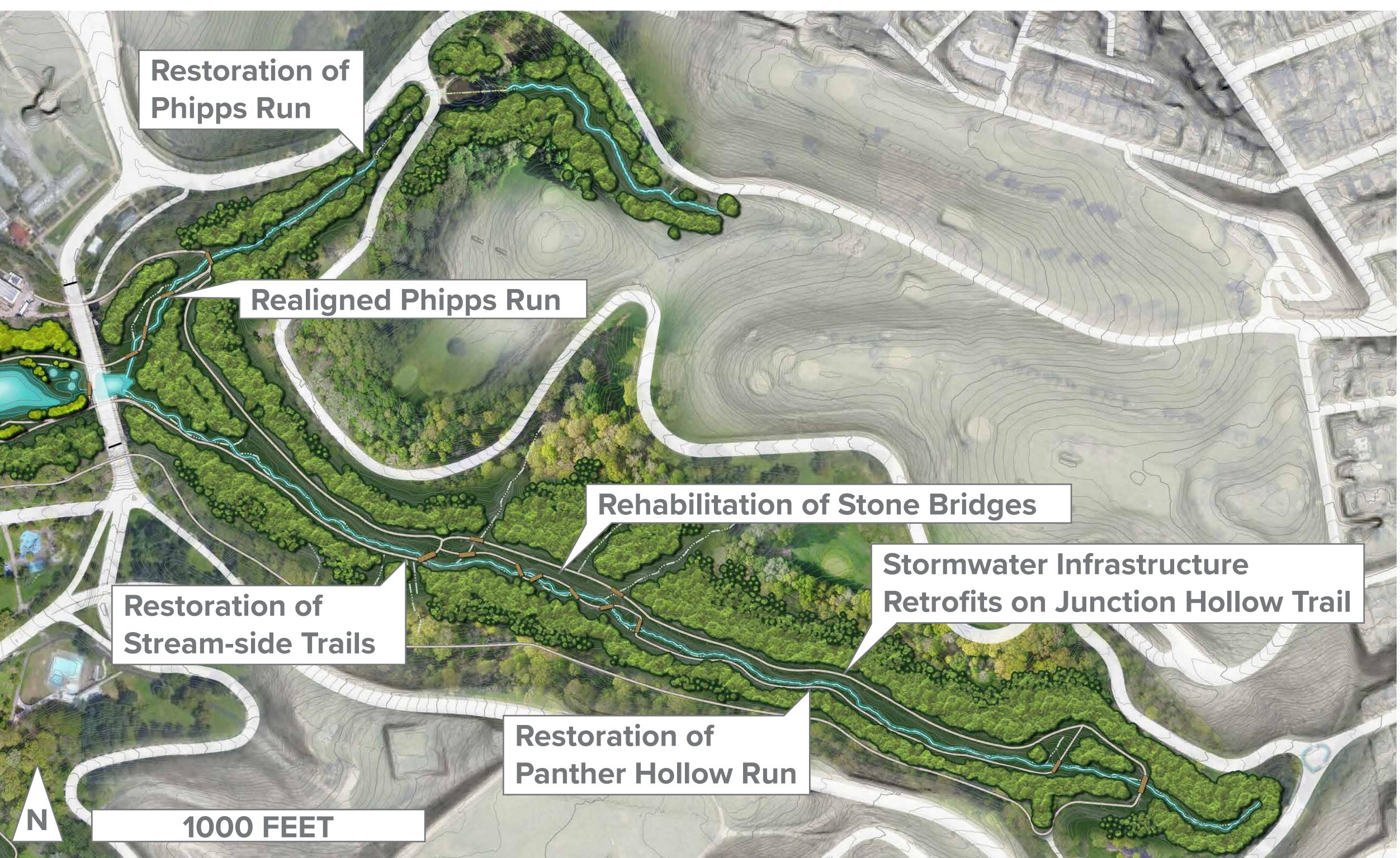
- To reduce erosion of stream banks and park trails
- To reduce sediment buildup in Panther Hollow Lake and in the future stream in Junction Hollow
- To restore rainwater capacity in the streams
- To improve water quality in the streams

THIS PROJECT WILL...

- Improve trails along the streams
- Improve function of bridges for people and water
- Improve habitats, biodiversity, and riparian ecology of the streams
- Simplify and reduce maintenance needs along the streams









THE STONE BRIDGES ARE A WELL-LOVED PARK FEATURE

They date to the era of the Works Progress Administration in the 1930s and let the nature trail and the stream meander across



BUT THE OPENINGS ARE TOO SMALL!

The bridges were not designed for the correct stream size. Today, many of these small bridges are clogged with sediment and debris. During rainy weather, this can cause the stream to be diverted onto the walking trails, causing damage to the trails and bridges.



...WHICH CAN LEAD TO SEVERE **EROSION AND SEDIMENTATION**

The small opening in the bridges force the water to move through at higher speeds, causing high rates of erosion that damage stream banks and pathways. The sediment that is eroded away is then deposited downstream, further restricting stream flow and causing damage to bridges and trails.

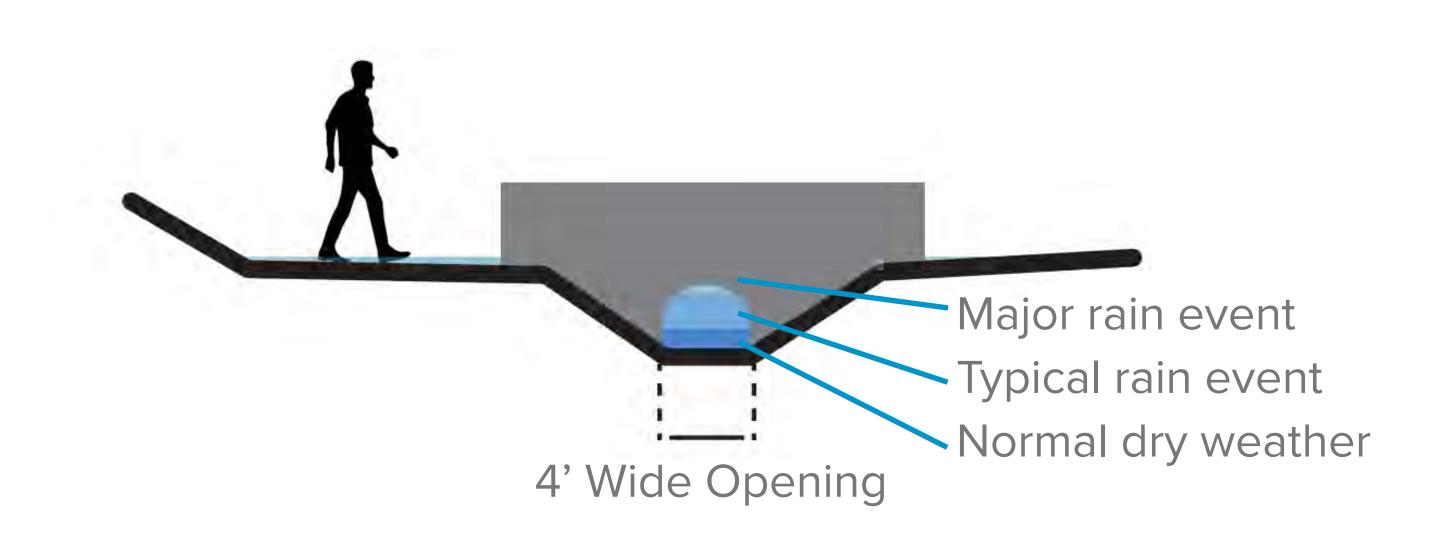
EXISTING STREAM CONDITION



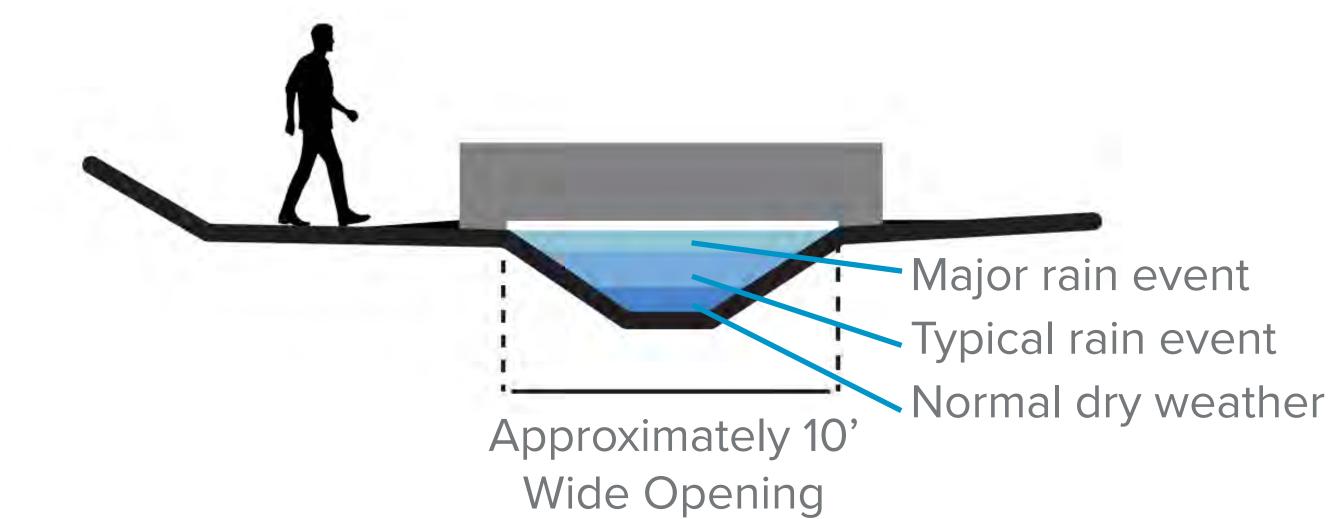
Low Shear Stress and

Erosion Potential

EXISTING BRIDGE PROFILES



PROPOSED BRIDGE PROFILES





875'

3 Panther Hollow Lake



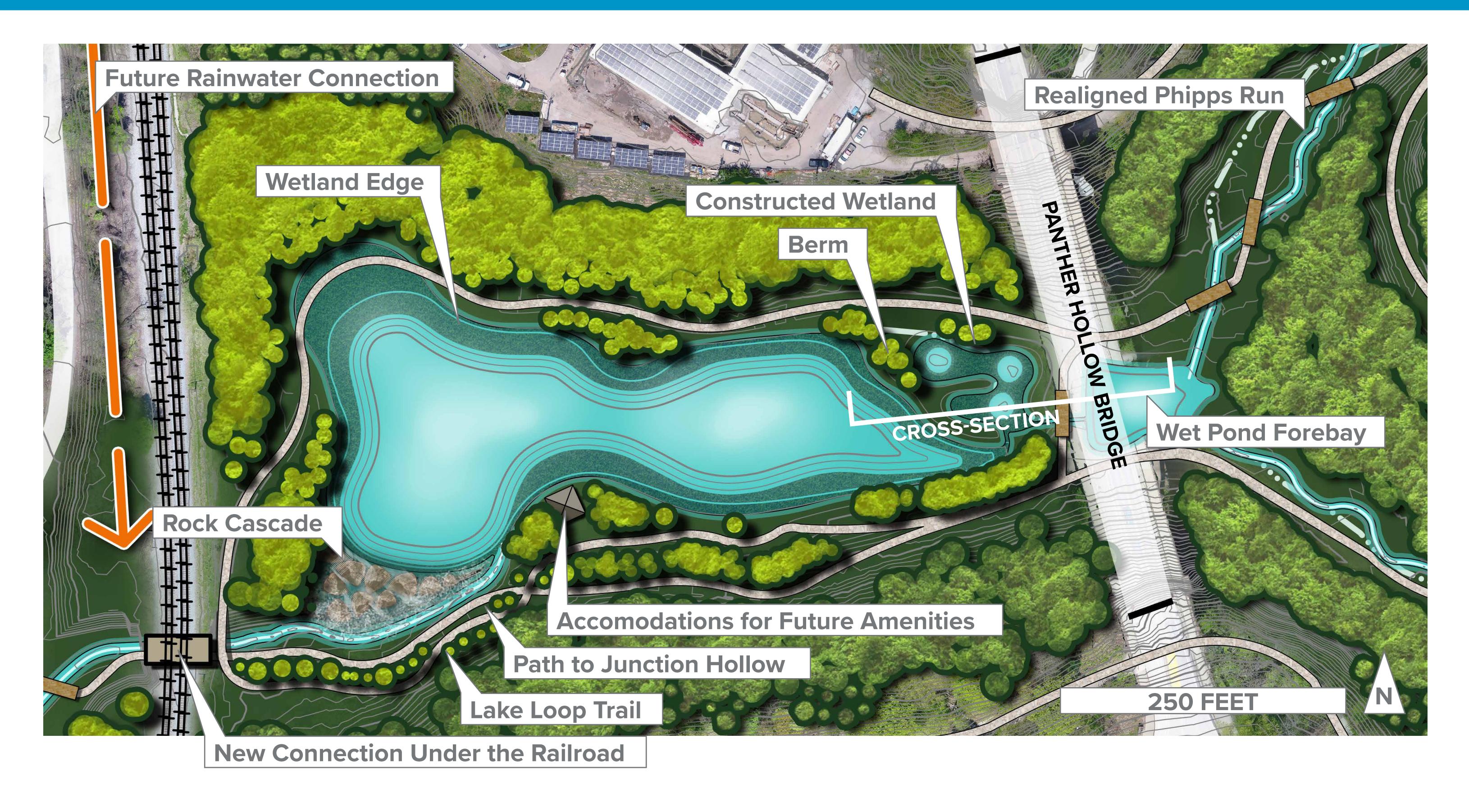
To achieve the project goals, PWSA needs to increase stormwater storage capacity within Panther Hollow Lake.

WHY ARE WE DOING IT?

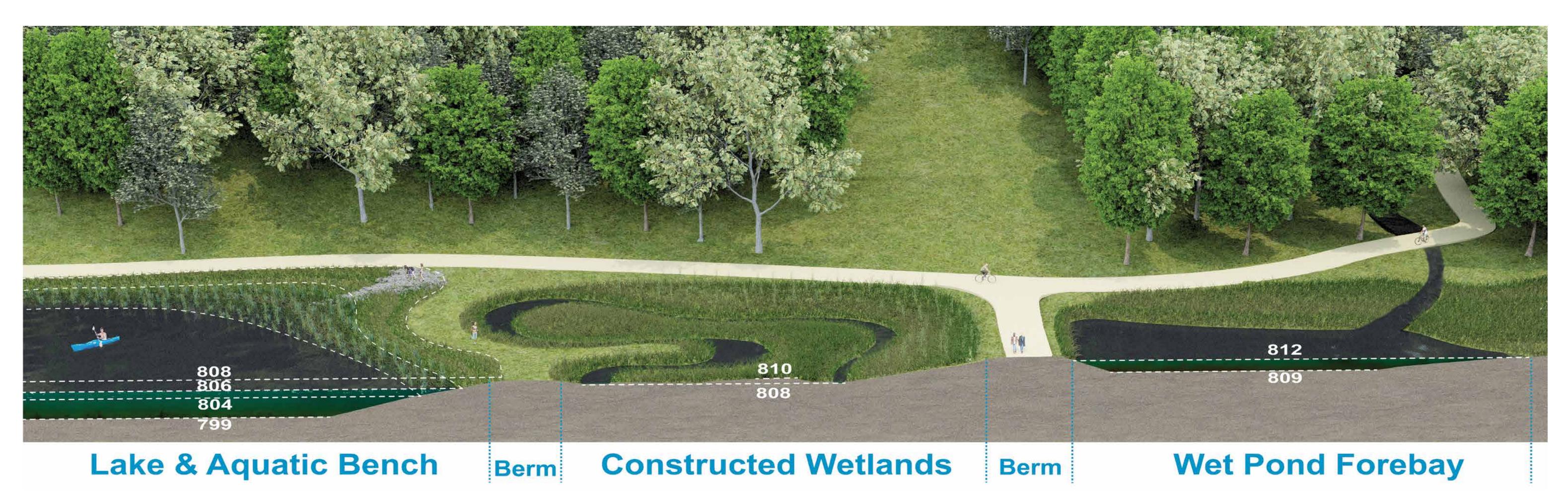
- To control flows to decrease downstream risk of flooding and basement sewage backups
- To improve water quality in the lake

THIS PROJECT WILL...

- Improve trails around the lake and create opportunities for future amenities as recommended by the Parks Master Plan
- Improve habitats, biodiversity, and riparian ecology
- Increase effectiveness of rainwater controls
- Decrease rainwater in the combined sewer system
- Enable a new stream through Junction Hollow



SECTION THROUGH THE LAKE INFLOW TREATMENT TRAIN



IMPROVED LAKE FUNCTION

The lake will be deepened and given a vegetated wetland edge to provide riparian habitats, improve water quality, and create a floodable lake edge. The wetland edge of the lake allows for the lake to have dynamic capacity, giving PWSA more control over large volumes of rainwater during major rain events. riparian ecology.

IMPROVED HABITATS

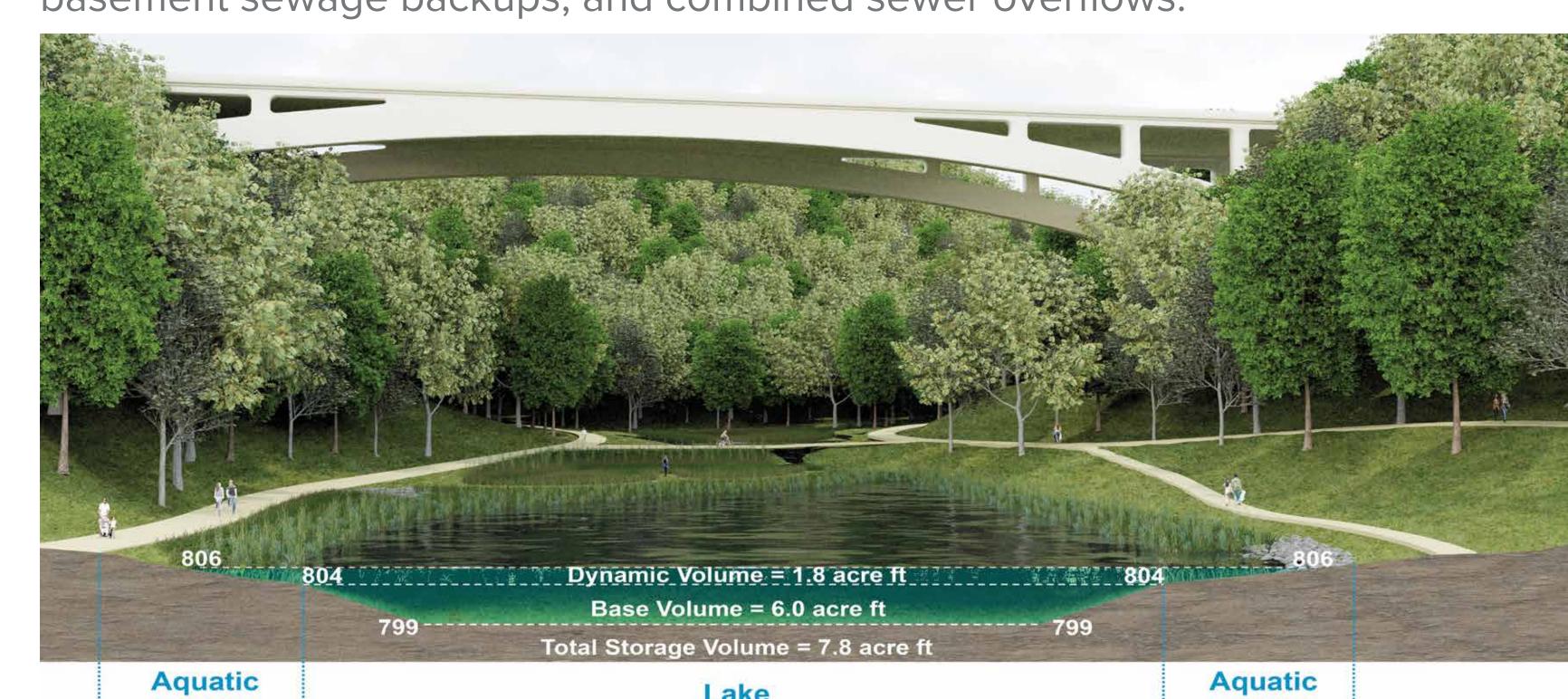
A meandering constructed wetland ecosystem will filter finer sediments and naturally process pollutants carried from park and neighborhood during storms by Phipps Run and Panther users an opportunity to see and learn about

IMPROVED WATER QUALITY

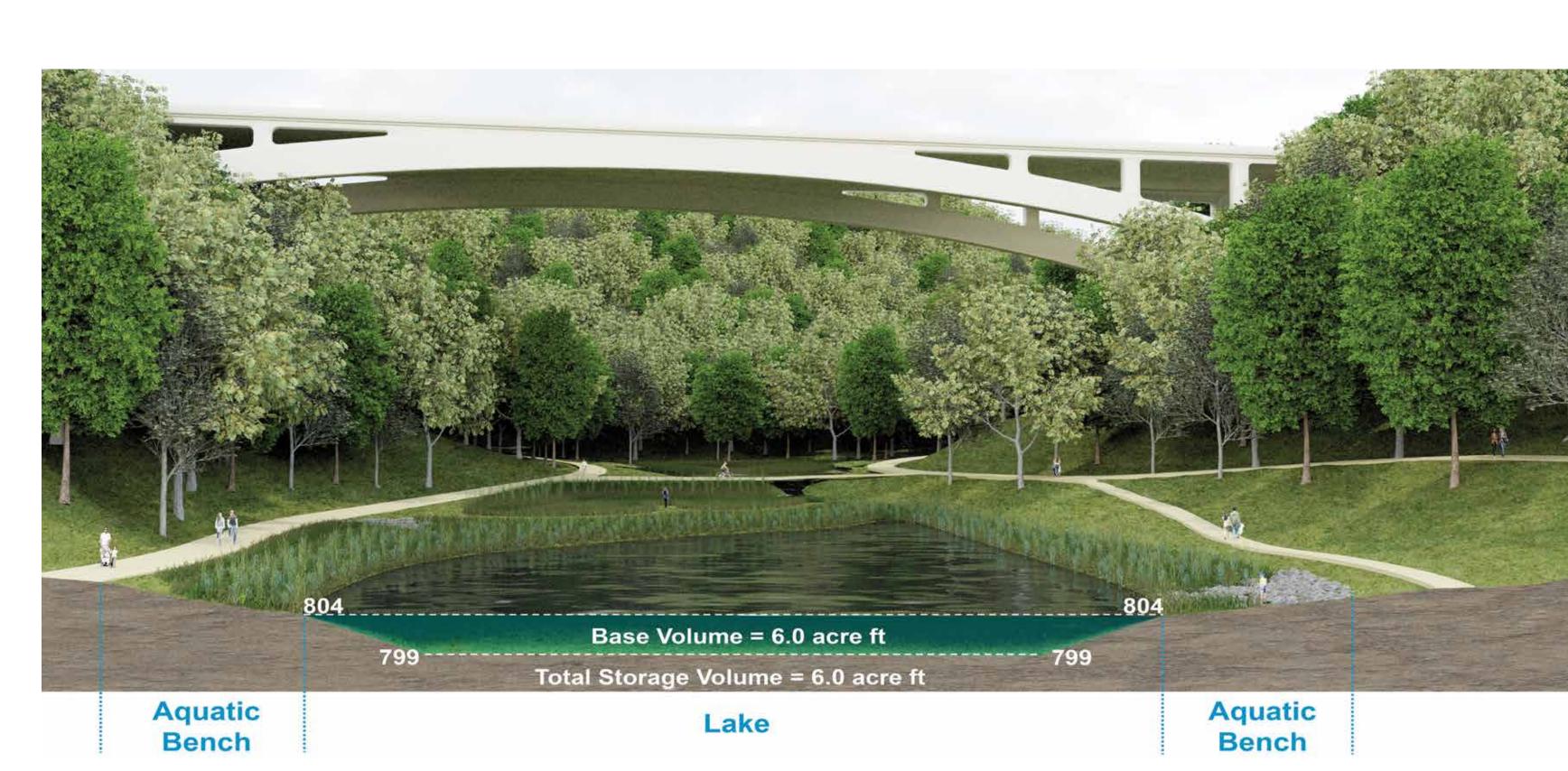
The wet pond forebay will capture coarse sediment and woodland debris transported streets and lawns to protect lake water quality. Hollow Run before they enter the lake. This Walking paths all around the lake will give park protects the lake from damage and ecological disturbance while also making the entire lake inflow treatment train simple to maintain.

DYNAMIC LAKE CAPACITY

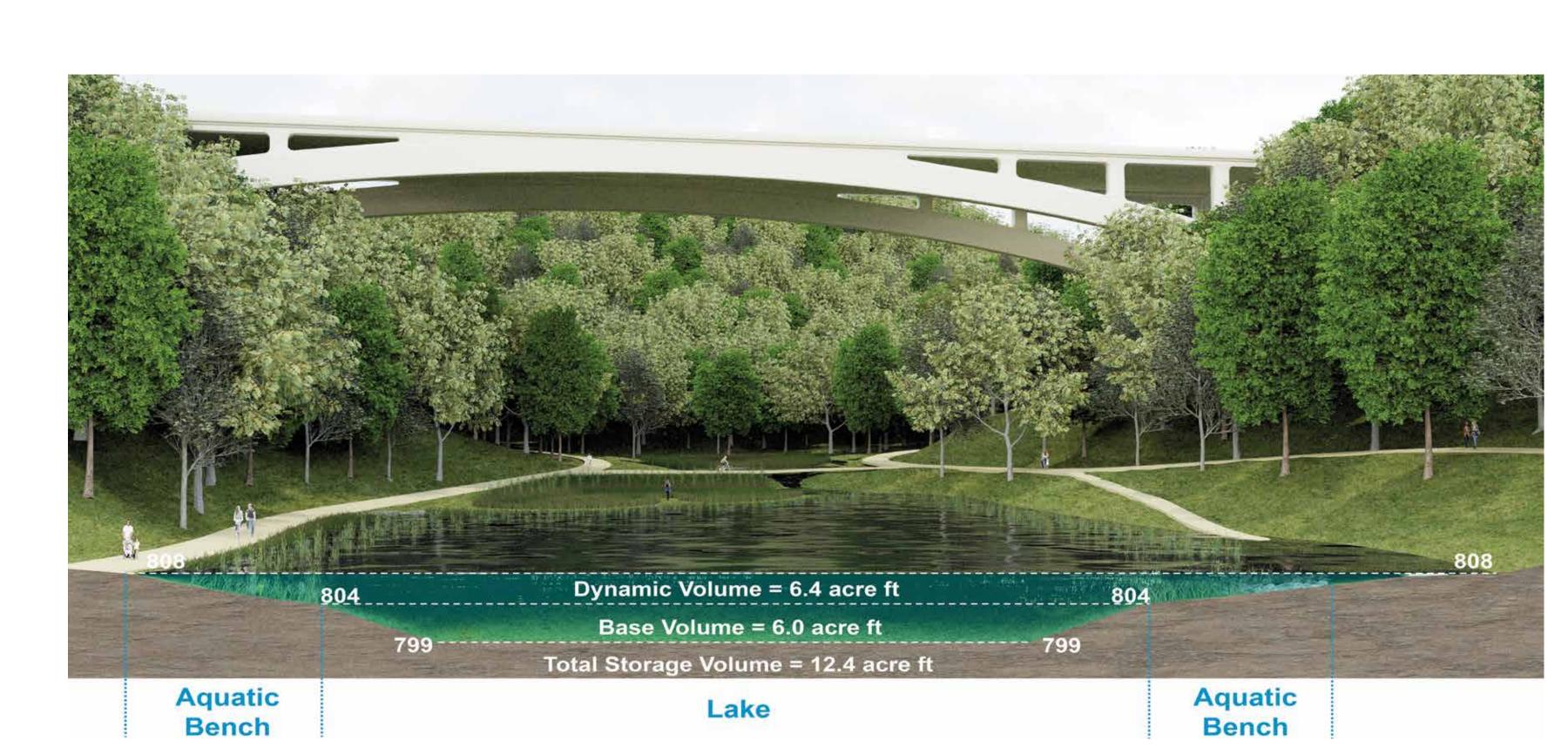
PWSA is evaluating active and passive techniques to maximize the rainwater storage capacity of Panther Hollow Lake. By storing high volumes of rainwater and slowly releasing it downstream after a rain event, PWSA can further decrease risk for downstream flooding, basement sewage backups, and combined sewer overflows.



Typical lake elevation



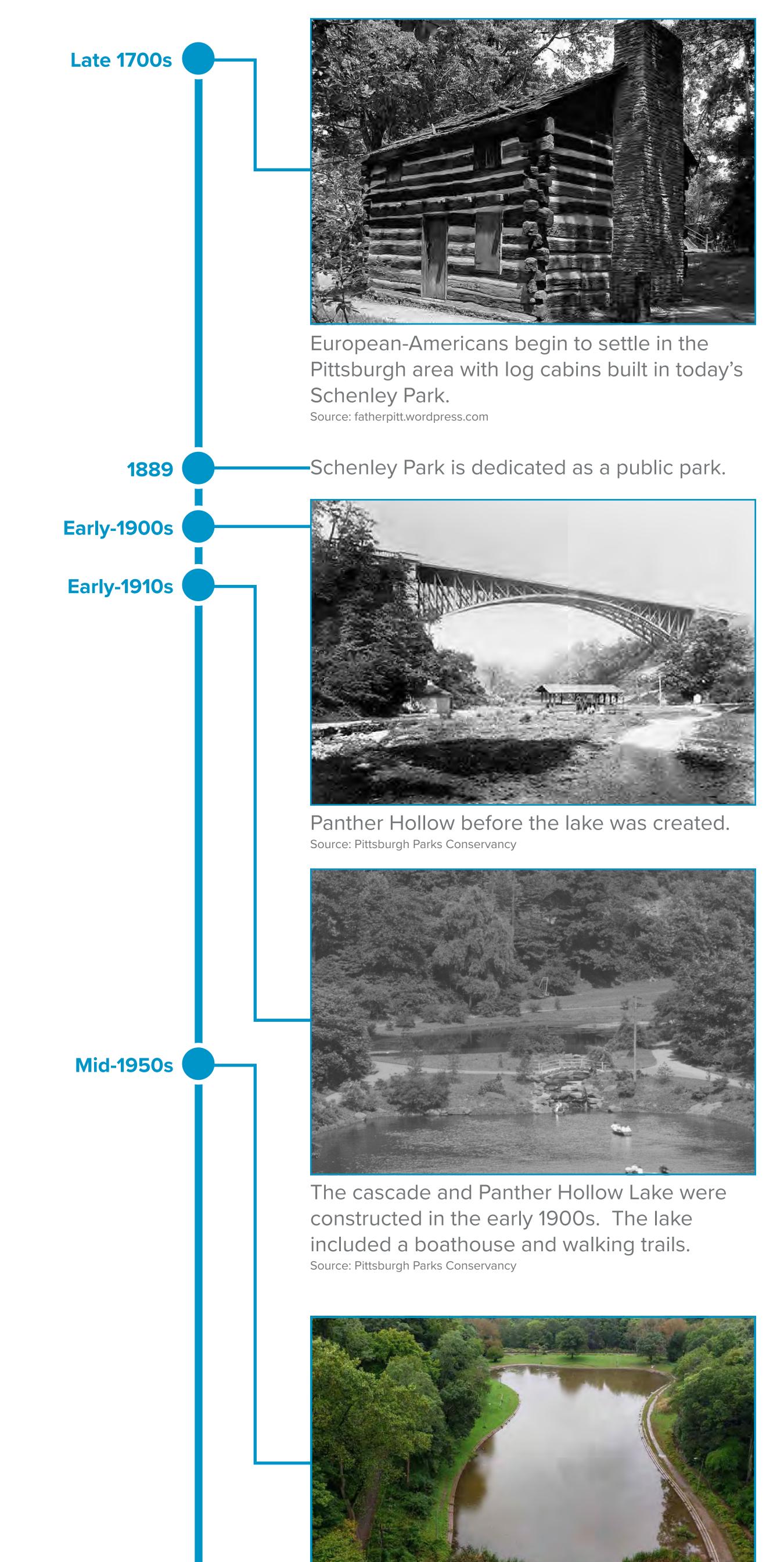
Planned drawdown lake elevation in advance of a major rain event



Lake elevation during a major rain event

A HISTORY OF CHANGE

Panther Hollow Lake has seen a lot of change over the years. In fact before industrialization in Pittsburgh, there was no lake at all! Our project intends to add new vibrancy and functionality to a key park landmark.



—The Parks Master Plan identifies the lake as a priority for local ecology and stormwater management.

edge during the mid-1950s.

The last substantial modification of the lake

was when it was given a modernist concrete

4 New Connection Under the Railroad



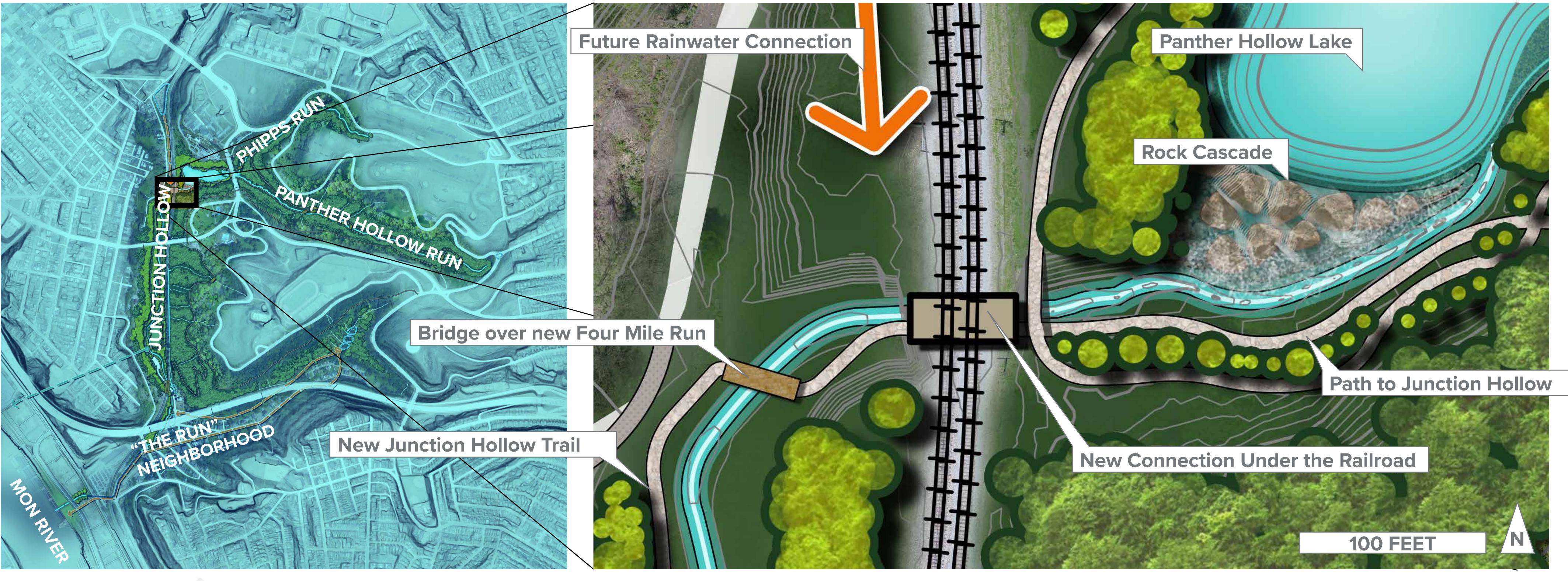
To achieve the project goals, PWSA needs to connect people and water from Panther Hollow Lake to Junction Hollow.

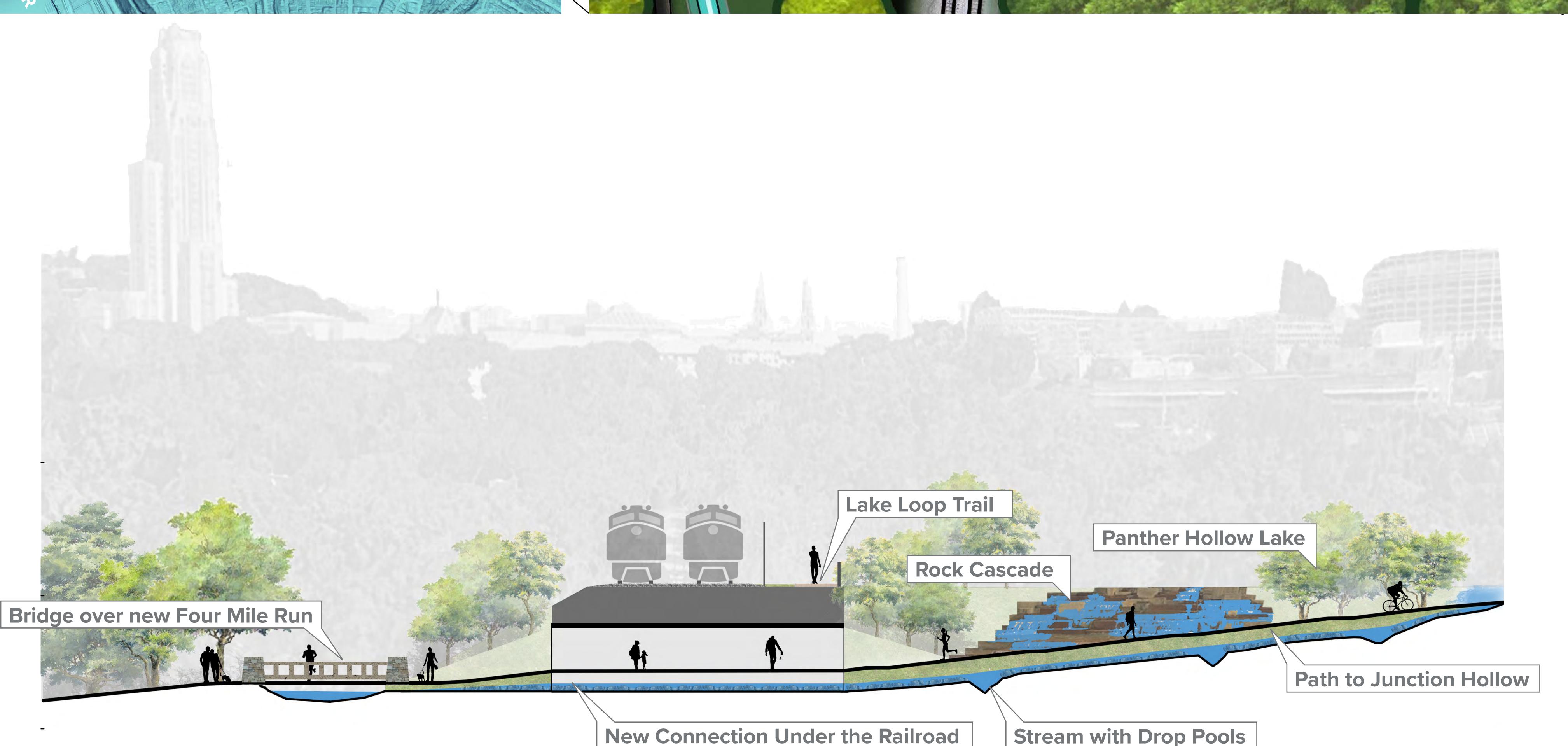
WHY ARE WE DOING IT?

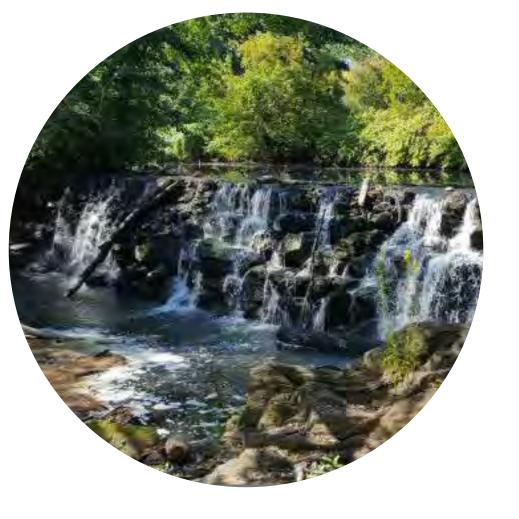
- To convey water to Junction Hollow and to the Monongahela River
- To keep rainwater out of the combined sewer system
- To create a stream in Junction

THIS PROJECT WILL...

- Decrease risk of basement sewage backups in The Run neighborhood
- Decrease risk of flooding in The Run neighborhood
- Create a safe pedestrian crossing of the railroad for park users
- Create a new ADA accessible pathway to Panther Hollow Lake







BEAUTY OUT OF NECESSITY

The lake outfall serves an important function during rain events as it allows the lake to store more rainfall while also allowing for higher rate of flow in the new Four Mile Run. This also creates the opportunity for a dramatic and engaging water feature in Schenley Park.



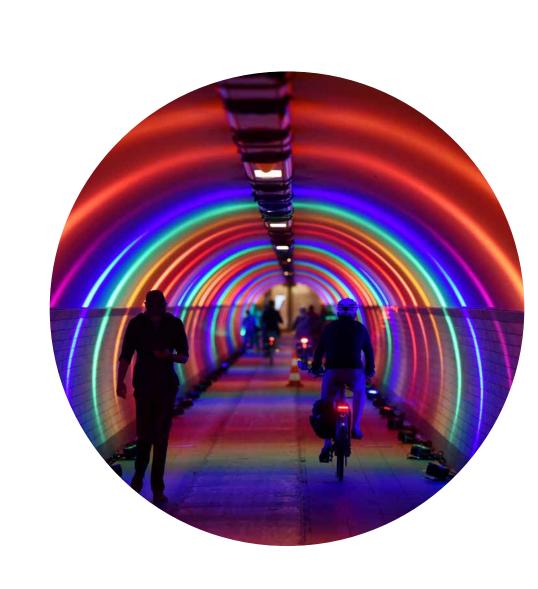
THERE IS NO SAFE WAY ACROSS THE RAILROAD TRACKS

There is currently no easy way to get from one side of the tracks to the other. In the absence of a safe and legal crossing, many park users cross illegally.



PWSA IS DESIGNING A TUNNEL FOR WATER AND FOR PEOPLE

A tunnel under the railroad would carry water from Panther Hollow Lake to Junction Hollow while creating a safe and accessible entry to Panther Hollow Lake.



THE TUNNEL COULD INCLUDE UNIQUE LIGHTING...

The new tunnel would need sufficient illumination both during the day and at night for safety and security.

Specialized lighting could make the tunnel an interesting and engaging place to visit.



...AND OPPORTUNITY FOR PUBLIC ART

The areas around the new tunnel will become a key focal point in the park, allowing for future additions of unique and interesting public art such as sculptures.

PWSA will coordinate with the Department of City Planning's Public Art and Civic Design Division.

5 New Stream Through Junction Hollow



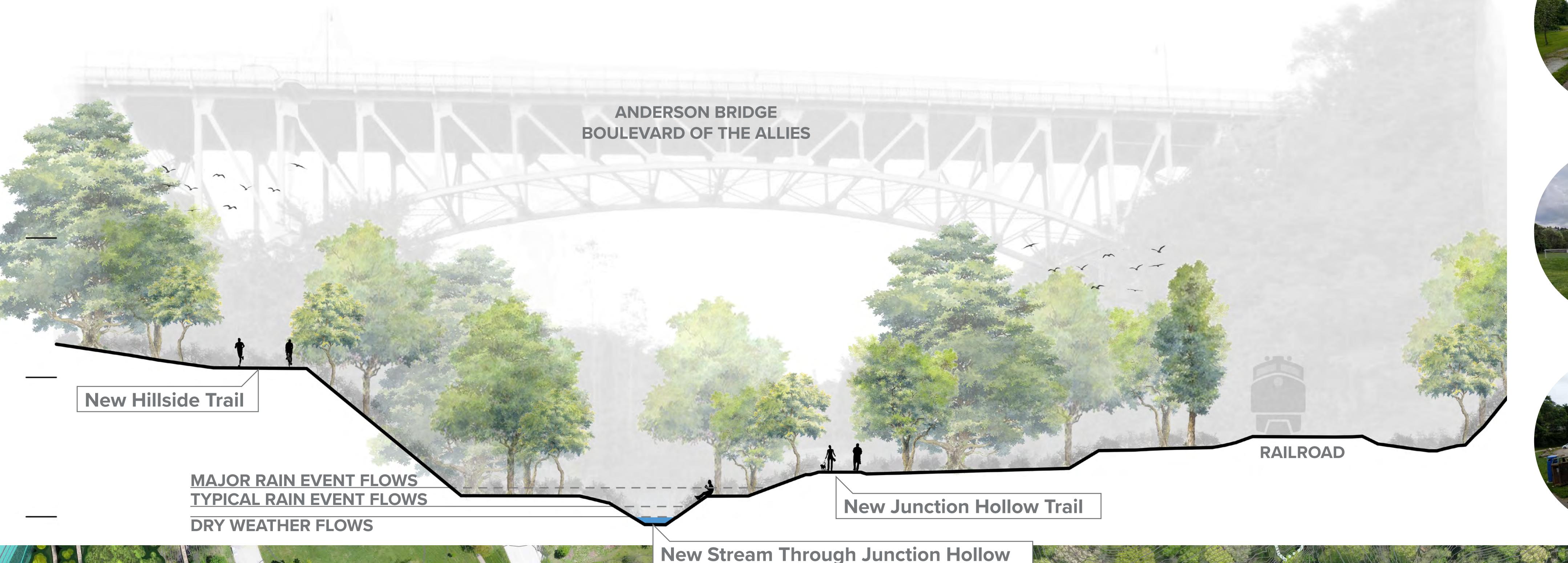
To achieve the project goals, PWSA needs to move rainwater through Junction Hollow.

WHY ARE WE DOING IT?

- To convey rainwater water through Junction Hollow and to the Monongahela River
- To keep rainwater out of the combined sewer system

THIS PROJECT WILL...

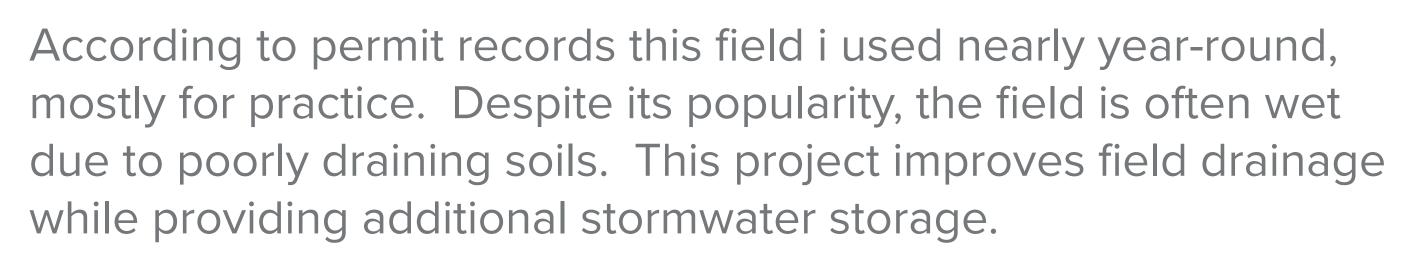
- Decrease risk of basement sewage backups in The Run neighborhood
- Decrease risk of flooding in The Run neighborhood
- Improve active and passive recreation in Junction Hollow
- Restore the stream and vegetation in Junction Hollow





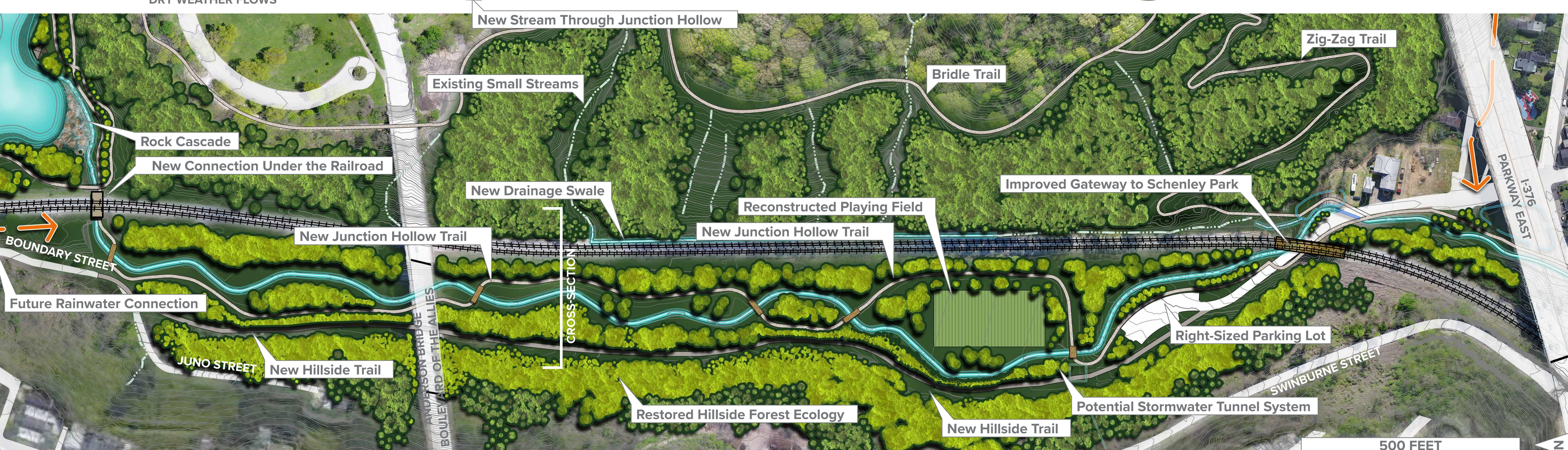
...A WELL-USED PLAYING FIELD...

appropriate materials for those features.



...AND VISITOR PARKING

The existing parking lot is both too large and innefficiently designed. To reduce paved area in the park and to make space for the new stream, this project will "right-size" the parking lot according to anticipated usage.



6 Connection and Gateway to Schenley Park



Potential Bioswale

To achieve the project goals, PWSA needs to move rainwater from the park to the Monongahela River.

WHY ARE WE DOING IT?

- To convey rainwater from Junction Hollow and to the Monongahela
- To keep rainwater out of the combined sewer system

THIS PROJECT WILL

- Decrease risk of basement sewage backups in The Run neighborhood
- Decrease risk of flooding in The Run neighborhood
- Improve community spaces, sidewalks, and roadways in parts of The Run neighborhood
- Improve the gateway to Schenley Park
- Create additional stormwater drainage capacity in The Run neighborhood
- Create connections for future stormwater separations



Connection from The Run to the River



To achieve the project goals, PWSA needs to capture rainwater from The Run and upstream neighborhoods and bring it to the Monongahela River.

WHY ARE WE DOING IT?

- To collect surface runoff from the neighborhood and surrounding hillsides
- To separate rainwater and sewage to reduce combined sewage overflows
- To build additional capacity to move rainwater from The Run neighborhood to the Monongahela River.

THIS PROJECT WILL

- Decrease risk of basement sewage backups in The Run neighborhood
- Decrease risk of flooding in The Run neighborhood
- Improve community spaces, sidewalks, and roadways in parts of The Run neighborhood





A UNIQUE COMMUNITY WITH CLEAR STORMWATER NEEDS...

The Run neighborhood is located at the bottom of a deep valley. During major rain events and high-river levels, this neighborhood is subjected to both flooding and sewage backups. This has health and safety implications for Run residents and impacts neighborhood roadways.



...AND COMPLEX INFRASTRUCTURE

Getting stormwater from the Run to the River requires navigating over and under major utilities, roadways, and railroads. Stormwater culverts and streams must be designed with a consistent downward gradient, so some utilities may need to be relocated. Additionally The Run neighborhood is only accessible by a single road. Construction along Saline Street must maintain continuous access for Run residents and emergency vehicles.



WITH POTENTIAL ACCESS TO THE RIVERFRONT AT HAZELWOOD GREEN

The Hazelwood Green master plan has designated Lot 07 as stormwater green space. PWSA plans to use this location to connect Four Mile Run back to the Monongahela River. This could also be a new amenity for Greenfield and Hazelwood residents as the Hazelwood Green site is developed.

