



## **Doan Brook Restoration near Horseshoe Lake Park**

### **Frequently Asked Questions (May 2023)**

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#### **ABOUT THE PROJECT**

**Q: Why is the Northeast Ohio Regional Sewer District involved in this project?**

A: The Cities of Cleveland Heights and Shaker Heights are responsible for dam safety regulatory compliance overseen by the Ohio Department of Natural Resources.

The Northeast Ohio Regional Sewer District has a Regional Stormwater Management Program that manages drainage areas greater than 300 acres in our service area and this portion of Doan Brook falls within the responsibilities of the Program.

The Sewer District is collaboratively working with Cleveland Heights, Shaker Heights and other key stakeholders for this work.

**Q: Who oversees this project?**

A: The Northeast Ohio Regional Sewer District is responsible for restoring the Doan Brook waterway, which is the project that currently has funding to be implemented through the Regional Stormwater Management Program.

**Q: Who is designing this project?**

A: Stimson is a nationally-renowned landscape architecture firm and AECOM is a global civil engineering firm with extensive experience in dam safety and removal. Together as a joint venture, Stimson-AECOM is leading the design team consisting of GPD Group, EnviroScience, Bluestone Conservation, KS Associates and River Reach Construction.

**Q: How was the design team selected?**

A: The team led by Stimson-AECOM was selected through an open Request for Proposal issued by the Sewer District. Staff from the Sewer District and the Cities of Cleveland Heights and Shaker Heights reviewed and ranked proposals from eleven design teams who submitted qualifications for this project. Four finalists were selected and invited for interviews in December 2021.

Fourteen members of the communities—seven from Cleveland Heights and seven from Shaker Heights—were present for the interviews of the finalist teams and were encouraged to ask questions as well as share input with the staff charged with scoring these teams.

**Q: What are you planning to do with the dams at Horseshoe Lake and Lower Lake?**

A: Neither dam is in compliance with the State of Ohio Regulations pertaining to dam safety and Ohio Department of Natural Resources, who oversees the Dam Safety Program, has ordered the Cities of Cleveland Heights and Shaker Heights to resolve these critical dam problems.

Through our Regional Stormwater Management Program’s “Chagrin and Lake Erie Tributaries Stormwater Master Plan,” the Sewer District has identified flood control benefits at Lower Lake. The same cannot be said for Horseshoe Lake: flood control benefits were not evident because it has a much smaller drainage area further upstream in the watershed.

Therefore, the Sewer District’s recommendation is to remove the dam at Horseshoe Lake, restore Doan Brook, and replace the dam at Lower Lake (subsequent project).

**Q: What research has NEORSR done to know if this is the right solution?**

A: The Sewer District completed an extensive \$10 million multi-year stormwater master planning process throughout Doan Brook and other Lake Erie tributaries, resulting in the “Chagrin and Lake Erie Tributaries Master Plan.” This included ecological evaluations, field surveys, rainfall and stream monitoring, stormwater modeling, geotechnical investigations, sediment sampling, consultation with historic resource experts, and evaluation of numerous alternatives. We have thoroughly modeled and studied the Doan Brook watershed and understand the best solutions to holistically address flooding, erosion and water quality issues.

**Q: What different options did you consider before moving forward with the decision to remove the dam?**

Many initial alternatives were vetted by the Sewer District during the stormwater master planning efforts within the Doan Brook watershed, including options similar to the idea from the Friends of Horseshoe Lake’s engineering consultant. Those options were eliminated from further consideration because of the lack of

demonstrated flood control benefits, dam safety compliance issues, and a lack of water quality and habitat improvements.

The final recommendation to remove the Horseshoe Lake Dam and restore the stream reach of Doan Brook was selected because it provided the best combination of water quality and habitat improvements, flood relief, ODNR dam safety compliance, and long-term benefits of not maintaining the Horseshoe Lake Class I Dam.

**Q: Why are you taking away the lake?**

A: The Horseshoe Lake is a human-made impoundment formed by a dam on Doan Brook at this location. That dam is more than 170 years old and failing. Horseshoe Lake was drained in 2019 because the State of Ohio Department of Natural Resources (ODNR) ordered the Cities of Shaker Heights and Cleveland Heights to do so and to take immediate steps to address the risks to public safety. The dam is classified by the ODNR as a Class I dam. Which means that should the dam breach there is probable loss of human life and property damage.

**DAMS**

**Q: Why does the dam have to be removed?**

A: The dams are the communities' responsibility. Since Horseshoe Lake Dam is out of compliance with the State of Ohio regulations pertaining to dam safety, the Ohio Department of Natural Resources, who oversees the Dam Safety Program, has ordered the Cities of Cleveland Heights and Shaker Heights to resolve these critical dam problems.

The dam is recognized by the State of Ohio's Department of Natural Resources as a Class I dam, which means that should the dam break during a major storm event, there is a catastrophic risk of a loss of life.

**Q: Why are dams a problem?**

A: Artificial lakes throughout the United States contribute to aging infrastructure that is expensive to maintain and creates ecological problems for waterways.

**Q: What is a breach and why is it a problem?**

A: A breach is an opening or breakthrough in the dam. An unintentional breach can rapidly form and grow, potentially releasing all the water impounded by the dam

with little to no warning. Beginning in 2018, Horseshoe Lake Dam was showing signs of failure which would have likely resulted in an unintentional breach.

A dam can be intentionally fully or partially breached to reduce the risk of a catastrophic failure. The City of Shaker Heights oversaw the design and construction of a partial breach of Horseshoe Lake dam in 2021 to lessen the risk if the dam fails.

**Q: Why is the dam failing?**

A: Horseshoe Lake Dam is more than 170 years old and stretches all the way from North Park Boulevard to South Park Boulevard, approximately 615 feet in length. It is an earthen dam and the stone portion you see is just the spillway, or the area where water is supposed to exit the Horseshoe Lake in a safe manner.

The major problems are related to the construction of the original dam, built prior to regulations and design standards. Seepage through the earthen dam and masonry joints, cracking in the masonry and sinkholes indicate the dam is unstable and deteriorating.

**Q: Why can't you just replace it?**

A: The Sewer District cannot fund the replacement with Regional Stormwater Management Program dollars because it is inconsistent with the requirements of the Program to reduce flooding, streambank erosion and improve water quality.

In addition to flood control, we consider issues like risk associated with an artificial stream impoundment, safety concerns, streambank erosion, water quality, environmental improvements and ecological improvements when we're developing the Master Plans and prioritizing projects.

## **DESIGN PROCESS**

**Q: What does “pre-design” mean? How does this differ from “design”?**

A: We are nearing the end of the Doan Brook Restoration near Horseshoe Lake Park project's pre-design phase. This is the phase where the design team (led by Stimson-AECOM) gathered data and information to guide the development of several alternatives. This was done through public engagement, field data collection and engineering analyses.

Pre-design lasted approximately one year, and the team has identified a preferred alternative based primarily on stream function, but also taking into consideration other factors such as trees, habitat, sediment reuse and incorporation of existing

features. The stream restoration will utilize the “upper confluence” alternative, where the upper branch and middle branch of Doan Brook will intersect upstream (to the east) of where the earthen dam is now.

The design team will now enter the “design” phase of the project. They will further refine and develop construction plans to remove the Horseshoe Lake Dam, manage (move or remove) sediment at the site, restore Doan Brook to a more natural state, re-establish north-south connectivity between North Park and South Park Boulevards, add new west-east connectivity throughout the park valley..

**Q: Have you considered including a lake in this design?**

A: The waterbodies we are including in this project – wetlands and floodplains within the stream corridor and valley, for example – provide ecological benefit and stormwater management, but an artificial water feature is not part of this plan.

The design team looked at stream function, sediment management, and solutions to minimize long-term maintenance. There were many factors to consider when designing this project to provide a healthy ecosystem and improved wildlife biodiversity.

**Q: What are you planning to do with the sediment and what’s in it?**

A: As part of the pre-design efforts, the sediment was evaluated for ways to potentially reuse the material onsite, both from a geotechnical and environmental perspective. To better inform decision making, borings were completed, and sampling of the material was conducted.

The analyses identified polynuclear aromatic hydrocarbons (PAHs) within the sediment of Horseshoe Lake. These compounds accumulate in sediment due to runoff from asphalt paved areas and are routinely found in stormwater basin sediments throughout Northeast Ohio.

Generally, the higher concentrations of PAHs were found primarily within the upper 4 feet of sediment within the lake. This is expected due to the industrial revolution and rise of the automobile. While the Sewer District strives to reuse as much sediment as possible onsite, consideration will be given during design to the concentrations of PAHs present. The Sewer District will follow its standard construction practices to manage as much of the material onsite as possible within any applicable regulatory standards.

**Q: What is it going to look like when complete?**

A: The Sewer District has hired expert landscape architecture, civil engineering and stream restoration professionals as part of the design team. We will create an improved, safe, and natural asset for the community.

Your participation in our public outreach meetings and surveys was vital throughout the pre-design process, and these opportunities will continue now that we are in design. There have been, and will continue to be, numerous opportunities for residents to meet with the design team, share ideas, and help envision the future of this park space.

**Q: Will there be a path around the park in the future?**

A: The park has not been fully designed yet, but there is space for a walking path to be built around it. The Sewer District will fund a walking path connection between North Park and South Park Boulevards as part of its project, as well as a new west-east path through the Doan Brook valley.

**Q: Will there be a lake when the project is complete?**

A: The Sewer District's project will not include any impoundments that require ODNR compliance or other maintenance not connected with stormwater management. Much of the current 615' earthen dam that created Horseshoe Lake will be removed and will not be replaced. The Doan Brook corridor and floodplain will be reestablished, leaving acres of land to be reinterpreted.

Although there will not be a lake, pre-design plans include wetlands and floodplains designed to manage stormwater in the park.

**Q: How do the Taxpayer Demand Letters sent to the Cities of Cleveland Heights and Shaker Heights impact the design work?**

A: The Taxpayer Demand Letters are not directed to the Sewer District and the design team will continue work on the Doan Brook Restoration near Horseshoe Lake Park project. Any questions about the letters should be directed to the Cities of Cleveland Heights and/or Shaker Heights.

**FUNDING**

**Q: Who is going to manage and maintain the project after it's done? Who is paying for this project?**

A: The Sewer District will manage and maintain the stream corridor. The Cities of Cleveland Heights and Shaker Heights will manage and maintain any improvements made to the surrounding parkland.

The Sewer District is paying for the restoration of Doan Brook, the removal of Horseshoe Lake Dam, and sediment management. The Sewer District is also paying for the landscape integration planning that is part of this design process and will continue to work collaboratively with the Cities of Cleveland Heights and Shaker Heights on park planning.

The Sewer District is also paying for the mitigation as a result of impacts to historical resources, re-establishment of a walking path from North Park to South Park Boulevards and a new west-east path through the Doan Brook Valley

**Q: What will Cleveland Heights and Shaker Heights need to pay for? Where are those dollars going to come from?**

A: When you look at the project in its entirety, we're paying to remove the dam, re-align the stream, restore the trail connection from North Park to South Park, add a new west-east trail through the Doan Brook valley, manage the significant amount of built up sediment behind the old dam, re-grade the park space and maintain the stream corridor and associated plantings in perpetuity.

Our project is to remove a failing Class I dam and restore Doan Brook, and the parklands themselves are larger than just the stream corridor. Through all the earthwork associated with the stream restoration, we are in a position to create a foundation for the park to be reimagined. What the Cities ultimately decide to do with the space is at their discretion and these are the discussions we all need to have. We have a collaborative relationship and will work with them as they determine funding sources for these amenities. The public process we're engaging in right now will inform those amenities.

**Q: Who makes the final decisions about this project?**

A: The Sewer District will work in partnership with the Cities of Cleveland Heights, Shaker Heights, and Cleveland.

## **STORMWATER MANAGEMENT**

**Q: Where is the flooding occurring?**

A: There are two types of flooding to consider.

The first is flooding during storm events from lack of stormwater management, development in the Doan Brook watershed, and the significant amount of impervious surface. Examples of this include further downstream from Lower Lake, repeated flooding in University Circle and Martin Luther King Jr. Boulevard frequently flood during large storm events. NEORSD's stormwater model developed for the "Chagrin River and Lake Erie Tributaries Stormwater Master Plan" (SWMP) demonstrated that Horseshoe Lake does not directly cause flooding, nor does it solve flooding, in University Circle. This model result is one of the primary reasons NEORSD cannot reconstruct the Horseshoe Lake Dam.

The second type of flooding is due to a dam failure which would result in the release of a large quantity of water which would likely result in the loss of life and property beginning immediately downstream and continuing to University Circle. This has been documented through a dam break analysis for the Emergency Action Plan (EAP) which was completed per ODNR's guidelines and reviewed and approved by ODNR's Dam Safety Program. Horseshoe Lake Dam is classified by ODNR as a Class I dam based on the risk of downstream flooding due to a dam breach, not due to a large storm event.

**Q: How will you manage stormwater if there's no lake?**

A: Horseshoe Lake Dam was constructed in 1852 and was operated by the Shakers until 1870 when woolen milling ceased. Horseshoe Lake and its dam was never intended to provide flood control and has primarily served as an aesthetic water feature since the late 1800s.

By restoring Doan Brook, adding vegetation, sinuosity (or curves along the stream) and floodplain that was once there, we will enable Doan Brook to access its floodplain, managing stormwater the way nature intended.

In conjunction with this work, we will also replace the dam at Lower Lake. Due to its location in the watershed, it is beneficial to overall flood control in the Doan Brook watershed. Being downstream of Horseshoe, Green, and Marshall Lakes, Lower Lake serves as a point of control for managing larger rain events in the watershed.

**Q: What is the Sewer District doing with the culverted section of Doan Brook in University Circle?**

A: The Chagrin River and Lake Erie Tributaries Stormwater Master Plan (SWMP) identified conveyance limitations in the culverted stream segments of Doan Brook through University Circle that contribute to flooding. Recommendations in



the SWMP included increasing conveyance (flow) capacity of these culverted stream segments.

NEORS has started a feasibility study to determine if increased conveyance is an option, whether by enlarging the existing culvert or adding a parallel culvert for conveyance. The study will also identify constraints for implementation and results of this study are expected late-2023.

## **TIMELINE**

### **Q: How long will this project take?**

A: The Sewer District is nearing the end of the pre-design phase of the Doan Brook Restoration Near Horseshoe Lake Park project but it will take some time to design and construct. .

The next step is to move into the detailed design phase which is expected to be complete in 2024. Our next public engagement meetings will likely occur in Fall 2023.

Design is expected to be complete in 2024, then we will bid the project for construction. The construction is expected to begin in early 2025.

The Sewer District is also actively negotiating a pre-design contract for the Lower Shaker Lake Dam Reconstruction and anticipate beginning the pre-design process in Summer 2023 (subsequent project). We plan to release a survey in late Summer and hold public engagement meetings in Fall 2023.

### **Q: Why will you replace the dam at Lower Lake and not Horseshoe Lake?**

A: Lower Lake's drainage area is 3121 acres, whereas Horseshoe Lake's drainage area is only 1180 acres. Lower Lake is what we call a "point of control" because the flows from not only Horseshoe Lake, but also Marshall Lake and Green Lake, drain or flow into Lower Lake and there is more storage opportunity at Lower Lake that will assist with downstream flood control.

### **Q: Wasn't there a plan to replace Horseshoe Lake Dam previously?**

A: The Cities originally approached the Sewer District when the Regional Stormwater Management Program was initiated to make repairs to Horseshoe Lake Dam, but the dam continued to deteriorate, and the designed repair became infeasible. At that time the Stormwater Master Plan study had begun which determined the best solution on a watershed level was to remove Horseshoe Lake Dam.

According to the latest Ohio Department of Natural Resources Dam Inspection Report (March 2023), “The conditionally-approved 2018 repair plans and specifications for Upper Shaker Lake Dam are no longer acceptable and if completed would not bring the dam into compliance.”

## **ENVIRONMENT & ECOLOGY**

**Q: What about the bird population? Where are the birds going? Will there be bird habitat?**

A: The Sewer District’s project will create habitat that will attract a variety of bird species. Depending on the features of Doan Brook, different species will relocate to the space.

## **HISTORY**

**Q: How will history be told / displayed in the future?**

A: Embracing the history of this site is important to the Sewer District. In addition to a local historian and archaeologist on the design team, we have been coordinating with the Ohio Historic Preservation Office.

NEORS has committed to developing an online educational virtual exhibit that will focus on the roles the dams and lakes played in relation to the North Union community of Shakers. The virtual exhibit will connect thematically with educational signs at both sites. The signs will be illustrated with historic and current photographs and illustrations that will be placed at prime viewing locations.

The whole of Horseshoe Lake Park holds legacy landscape features from three historical periods: early settlers (1810s), Shakers (1822-1889) and early Parklands (1890-1935). The Doan Brook Restoration planning phase will identify conservable features and publish them for public input regarding conservation priority.

## **OTHER QUESTIONS**

**Q: What about the idea that the Friends of Horseshoe Lake (FOHSL) has presented?**

A; The FOHSL’s engineering consultant first presented their idea to us on February 16, 2022 and District staff had follow up meetings and phone calls with their members, consultants, and lawyers as well. We considered their idea and responded with a six-page letter that is available online at

[neorsd.org/DoanBrook](http://neorsd.org/DoanBrook).

Their proposed idea does not address the issues with Horseshoe Lake Dam or meet the requirements of the Sewer District's Regional Stormwater Management Program. Based on the findings of NEORSD stormwater master planning process, specifically the "Chagrin and Lake Erie Tributaries Master Plan," the Sewer District will not participate in any project that replaces the dam.

**Q: Where can I get more information / see the presentation recording / watch the informational videos?**

A: The Sewer District is posting all updates to our dedicated online landing page at [www.neorsd.org/DoanBrook](http://www.neorsd.org/DoanBrook).

**Q: How do I share my opinion?**

A: During the pre-design process, we offered many opportunities for input, and our partner LANDstudio evaluated the results of a survey that garnered nearly 850 responses.

Including a virtual meeting and engagement open house in August, a series of walking tours, several pop-up events and a public survey.

Our next public engagement opportunities include a virtual public meeting on May 15, 2023, at 6 p.m., and engagement open house on May 18, 2023. Details and registration is available at [www.neorsd.org/DoanBrook](http://www.neorsd.org/DoanBrook).

All prior virtual meetings are posted at [www.neorsd.org/DoanBrook](http://www.neorsd.org/DoanBrook).

The Sewer District's Customer Service email address is [askus@neorsd.org](mailto:askus@neorsd.org).

**Q: What were the survey results?**

A: LANDstudio produced a summary report and it is available at [www.neorsd.org/DoanBrook](http://www.neorsd.org/DoanBrook).