Lower Shaker Lake Project Q&A

updated July 23, 2025

BACKGROUND INFORMATION

The Northeast Ohio Regional Sewer District (Sewer District) completed a stormwater master plan of Doan Brook in 2021 with goals of reducing flooding, mitigating erosion, and improving water quality.

Following the completion of this stormwater master plan, the direction at Lower Shaker Lake was to construct a new, fully compliant dam that met the required safety standards with necessary floodwalls, a new auxiliary spillway, and a rebuilt principal spillway.

The Lower Shaker Lake Dam Reconstruction Project's pre-design began in 2023. During the pre-design phase, the Sewer District reviewed the Doan Brook stormwater master plan assumptions – as we do with all stormwater projects – with additional data collection and with continued refinement of the stormwater model. We also became aware of opportunities for additional stormwater conveyance in University Circle.

The initial Lower Shaker Lake Dam Reconstruction pre-design is now finished. The impacts to the landscape for dam reconstruction became clear. The stormwater model was refined, and the results were updated. A new direction emerged.

ABOUT THE PROJECT

Q: Why is the Northeast Ohio Regional Sewer District involved in this project, and who else is involved?

A: The Cities of Cleveland Heights and Shaker Heights are the responsible owners for the Class I dam; this means that they must follow the dam safety regulations overseen by the Ohio Department of Natural Resources (ODNR) Dam Safety Program. The regulations for dams are in the Ohio Administrative Code.

The Sewer District has a Regional Stormwater Management Program that manages streams and culverts draining 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, Cleveland, and other stakeholders on this project.

Q: Who oversees this project?

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A: The Sewer District is overseeing the project in coordination with the Cities of Cleveland Heights and Shakers Heights.

Q: What is wrong with Lower Shaker Lake Dam?

A: Lower Shaker Lake Dam is more than 180 years old and stretches across Doan Brook from North Park Boulevard to nearly South Park Boulevard. It is an earthen dam; the stone bridge on Brook Drive is the dam's principal spillway, which conveys water from the lake to the downstream channel of Doan Brook.

ODNR has identified deficiencies with the dam and have stated that the dam is out of compliance with the Class I High Hazard dam safety requirements. A Class I High Hazard dam classification means that should the dam fail during a major storm event, there is a probable loss of life and property damage downstream.

One of the largest deficiencies for the dam is that it cannot safely pass the required design storm for a Class I High Hazard dam, which ODNR defines as the probable maximum flood. To remedy this deficiency, a new reconstructed dam would need a larger spillway structure, or structures, and need flood walls on both sides of the lake. To be in compliance with today's safety standards, the dam either needs to be removed or reconstructed.

A CHANGE IN DIRECTION

Q: What is the new plan for Lower Shaker Lake Dam?

A: After further stormwater modeling and analysis, the Sewer District determined that Lower Lake Dam does not provide notable flood control for the downstream University Circle area. Based on this, the Sewer District is recommending the removal of Lower Lake Dam and fully restoring Doan Brook and the associated stream corridor with functional floodplains.

Q: What is driving this change?

A: The dam is the responsibility of both the Cities of Cleveland Heights and Shaker Heights, as owners and operators of the dam. Since Lower Shaker Lake Dam is out of compliance with the required dam safety regulations, ODNR, who oversees the Division of Water Resources - Dam Safety Program, is requiring the Cities of

Cleveland Heights and Shaker Heights to resolve the dam safety non-compliance deficiencies with the dam.

The Lower Lake Dam, similar to the Horseshoe Lake Dam, was not built to modern standards for earthen dams, nor was it built for flood control. This dam's non-compliance must be addressed. This means either reconstructing the dam to meet Ohio dam safety requirements for a Class I High Hazard dam or removing it.

Based on the District's 2021 findings, the solution was to reconstruct the dam based on downstream flood control benefits. Since that initial recommendation, we have learned from updated data that the flood control benefits are not as notable as we once thought and that a reconstructed dam would need flood walls up to 8' high and an additional large concrete spillway structure to safely convey the flow required by ODNR. To meet Ohio dam safety requirements, the reconstructed dam is estimated to cost $43M, which does not include the cost to remove the lake sediment.

There are two main drivers causing the change in this project's direction. First, we have updated and refined the hydraulic and hydrologic model that more accurately represents flood risk along Doan Brook. Second, an opportunity to reduce flood risk at University Circle by constructing a new culvert at Cleveland Museum of Art's Wade Lagoon has become a feasible project.

The benefits resulting in the project's changed direction of dam removal include 1) a more holistic and natural solution compared to constructing concrete structures, including flood walls on either side of the dam and 2) a more cost-effective solution, in construction costs, life-cycle cost, and future administrative burden for the cities.

Q: Why is reconstruction of the dam not being pursued?

A: The reconstruction and replacement of the dam will not provide notable downstream flood control within University Circle. Reconstructing the dam will create an excessive burden to local municipalities to operate and maintain, as well as a financial burden to insure and to eventually replace the dam structure again, after its useful life. Since the 2021 Stormwater Master Plan, the stormwater

model has been significantly refined. Updates to the stormwater model include incorporating local storm sewers and applying a two-dimensional mesh to more accurately simulate surface flood routing. The updated model shows no meaningful difference in flood risk in the University Circle area with or without the Lower Lake Dam. Additionally, a new opportunity at Wade Lagoon near the Cleveland Museum of Art allows for improved conveyance of Doan Brook beneath University Circle, reducing flood risk in that area.

Q: What has the Sewer District done to better understand flooding on Doan Brook, and how did that lead to the change in plans?

A: We have collected additional rain, level, and flow data and have refined our stormwater models with additional hydrologic and hydraulic detail. Based on the additional data collected and refinements, the model was calibrated by comparing to real storm events that were measured in the field. Through this work, we now have a more accurate understanding of how buildings and roads flood downstream of Lower Lake Dam. The results from the refined stormwater model show that Lower Lake Dam does not notably change the flood conditions in the University Circle area. Flooding along North Park Boulevard and Coventry Road next to the dam, this can be addressed by either dam reconstruction or dam removal.

Q: **What is stormwater modeling?**

A: Stormwater models are networks that represent a stormwater system; this can include storm sewers, streams, catch basins, manholes, stormwater control measures, and underground portions of streams called culverted streams. This modeled stormwater system helps us identify areas where stormwater may lead to flooding. For example, if we were modeling a storm sewer under a street and the storm sewer could no longer hold anymore water, the model would show the water pushing up out of the storm sewer or ponding in the lowest spots on the street. This visual way of modeling and incorporating topography is called a two-dimensional mesh. Modeling can be less detailed (maybe you only add the stream into the system) or more detailed (you add all components including small storm sewers and catch basins along streets or even the drainage system of a school and

its parking lots). Early in our Regional Stormwater Management Program during the master planning phase, our stormwater models were still being built. With our more detailed two-dimensional mesh models, we have a more accurate understanding of stormwater impact in this area.

A COMMITMENT TO COMMUNITY

Q: How will the community be involved in the conversations around Lower Lake?

A: Community engagement and quality design remain priorities in all our efforts to solve stormwater problems and serve residents.

The Sewer District will host public meetings and webinars in the coming months to review all information related to this project. At those open house style meetings, we encourage residents and stakeholders to come and ask questions and provide input.

In addition, our Watershed Programs team is always able and willing to answer questions or join meetings to discuss our work.

We will take the same care and attention to this project as we have in our Doan Brook Restoration at Horseshoe Park project.

Q: Do the Cities of Cleveland Heights and Shaker Heights agree with this decision?

A: The Sewer District is currently communicating with both cities on the change in direction for this project.

Q: Who is paying for this?

A: The Sewer District, under the Regional Stormwater Management Program, will pay for the removal of Lower Lake Dam and the full restoration of Doan Brook, its associated floodplain, and stream corridor.

If you have questions about this, or any of our other Regional Stormwater Management Program projects, please contact your Watershed Team Leader Cisco Rivera at RiveraF@neorsd.org.

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For any other NEORSD-related needs, please contact Customer Relations at 216.881.8247 or AskUs@neorsd.org.