ERD-EL-EPR-RIT 14 August 2023

MEMORANDUM FOR RECORD

SUBJECT: Trip Report for Pig's Eye Lake Island Construction Beneficial Use Project

1. On August 10, 2023, Jennifer Miller visited Pig's Eye Lake, St. Paul, Minnesota to view the islands under construction (a navigation sediment beneficial use project). She was escorted by Nick Chyko, of JFBrennan, who is working on the project. The weather was partly cloudy and around 80 F.

2. The opportunity for this project arises from the St. Paul District navigational maintenance program in the Mississippi River. For material management, clean sediment is stockpiled upland for future uses. Over a multi-year period, thousands of cubic yards of clean, sandy sediment from "Pool 2" (the stretch of river is along the pool created by Lock and Dam 2 at Hastings, MN) were stockpiled at a sediment management site (Pine Bend Borrow Area). Per the Dredged Material Management Plan (DMMP) for Pool 2, the anticipated dredging volume is more than 6 million cubic yards (CY) over the next 40 years. Due to the large volume of sediment anticipated, beneficial use options are desired.

3. Pig's Eye Lake is a backwater area of Pool 2 (Figure 1). A small channel connects the lake to the river, and the water level in the lake fluctuates with the river stage. Under normal pool levels (the pool water level is managed at Lock and Dam 2), the lake is very shallow, only a few feet deep. Pig's Eye Lake has several identified issues including bank erosion caused by waves (although shallow, the lake has a long fetch which allows waves to develop), low levels of sediment contamination caused by urban influences on the surrounding lands, and a lack of habitat diversity caused by the uniform lakebed level and eroded shoreline. An identified solution to these issues was to construct islands of clean sediment, to form shallow areas and support native vegetation, and to function as a wave break. A total of 6 islands are being constructed. (Figure 2)

4. The Pig's Eye Lake island construction project is a joint venture by LS Marine and Brennan. LS has a navigational maintenance contract for Pool 2. They have been responsible for loading barges and will also place fine grained sediment on the islands as a growth layer. Brennan was responsible for constructing the islands from granular sediment.

5. Stockpiled sediment from the management site was loaded onto flatbed barges, which were transported to Pig's Eye Lake. At the lake, the material was off-loaded mechanically into a hopper that fed the sediment to pumps for hydraulic placement. (Figure 3) The sandy sediment was placed directly on the soft bottom, to elevations above the final planned grade to allow for settlement over the winter. This method worked well for the shallow lake, and a typical placement rate of 3000 CY per day

was achieved. A total of approximately 448,000 CY of granular sediment was placed at the islands. Due to environmental windows and river stage constraints, island base construction occurred from July – November 2022 and mid-June – August 2023. Island capping with fine grained material is scheduled to occur from August – November (or earlier) 2023.

6. The island base construction was nearly complete at the time of the site visit. Sediment placement had been completed, and the islands were being graded to a final configuration (Figure 4). (The tolerance for grading is 5”, and small earthmoving equipment was being employed to meet the desired contours. Figure 5) The islands have a stepped terrain, to support various native vegetation. The next stage of the project will be to cap the granular sediment base of the islands with fine grained sediment from the navigation projects. The fine-grained material will support the plantings. It is anticipated that the top layer of sediment (12-18” of fine grained sediment over the sand base) will be placed this year, and initial planting will be completed prior to cold weather. Some planting (willows for example) will occur in the spring, due to more stringent planting windows.

7. Although the project is not yet complete, there is ample evidence that it is already successful from a habitat standpoint. Multiple birds, including ducks, herons, and seagulls, were actively using the islands (Figure 6, Figure 7). Volunteer vegetation was growing in many areas.

8. The point of contact for questions about this memorandum is the undersigned, at Jennifer.miller@usace.army.mil or 312-259-6826.

JENNIFER MILLER, PhD, PE
Research Environmental Engineer

Figure 1: Pig's Eye Lake, St. Paul, Minnesota. Aerial image is from summer 2022, after island construction had begun. The red arrow indicates the connecting channel between the Mississippi River and the lake.

Figure 2: Pig's Eye Lake Island Layout

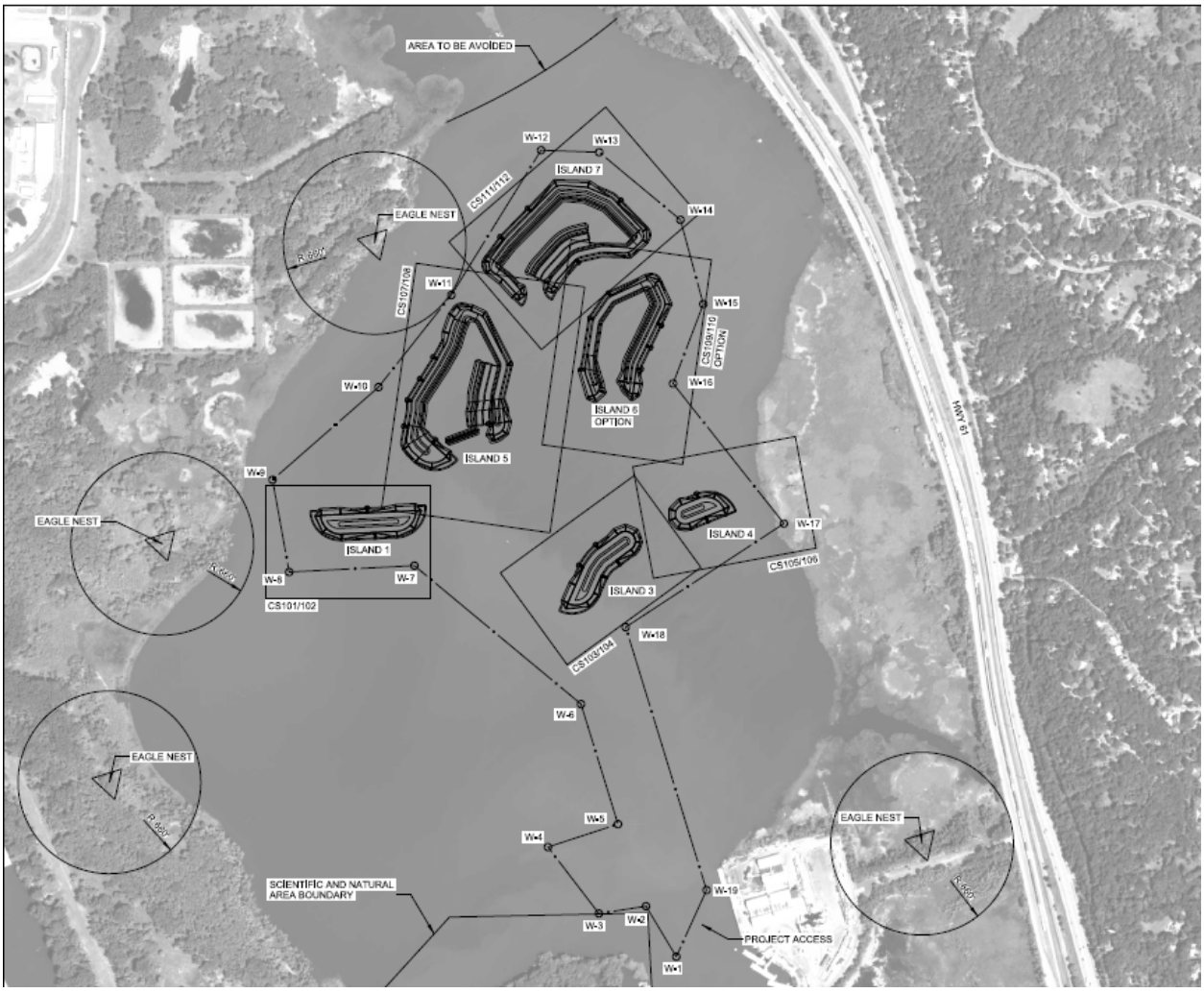

Figure 3: Brennan plant for placement. A shallow draft barge holds an excavator (green) for off-loading sediment from a barge into the red hopper. The sediment is pumped into place using hydraulic pumps.

Figure 4: Earthmoving equipment is used to distribute granular material after settlement has occurred, to meet the final grade requirements. The long arm excavator on the right side of the photo is distributing sediment at the edge of the island; soft sediments were displaced during island construction.

Figure 5: Another view of the islands after grading the granular base. Volunteer vegetation has already appeared. This area will be capped with fine grained sediment that will support native plantings.

Figure 6: Approaching one of the islands in a johnboat, vegetation and waterfowl are apparent even though island construction is not complete.

Figure 7: Ducks on the island. Seagulls and herons were also using the islands but were less willing to be photographed.