LOWER MINNESOTA RIVER
WATERSHED DISTRICT

Executive Summary for Action

Lower Minnesota River Watershed District Board of Managers Meeting
Wednesday, September 21, 2022

Agenda Item
Item 6. E. – Dredge Management

Prepared By
Linda Loomis, Administrator

Summary
At the August 17, 2022, Board of Managers meeting, the Board authorized return of unused 2020 grant funds to the State of Minnesota. Young Environmental Consulting Group has evaluated the LMRWD dredge management operations and has provided a summary of its findings with a list of next steps.

The US Army Corps of Engineers (USACOE) has issued a notice of Minnesota River Dredging at Peterson's Bar. At the September 2022 Upper Mississippi River Waterway Association, the USACOE stated that Minnesota River dredging has begun and they expect to continue for two weeks.

Attachments
Young Environmental Consulting Group Technical Memorandum dated September 14, 2022: Lower Minnesota River Watershed District Dredge Site Visit Summary

Recommended Action
Motion to direct staff to proceed with next steps identified in the Technical Memorandum

Young Environmental Consulting Group, LLC

Technical Memorandum

To: Linda Loomis, Administrator
Lower Minnesota River Watershed District

From: Katy Thompson, PE, CFM
Hannah LeClaire, PE

Date: September 14, 2022

Re: Lower Minnesota River Watershed District Dredge Site Visit Summary

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As outlined in the Lower Minnesota River Watershed District's (LMRWD's) workplan to the Board of Water and Soil Resources, the LMRWD will implement capital improvement projects and continue the operation and management (O&M) of the Cargill East River (MN – 14.2 RMP) Dredge Material Site (Site) located on the Minnesota River in Savage, Minnesota (Figure 1). O&M activities include maintenance of Vernon Avenue and regular culvert cleaning. On August 22, 2022, Young Environmental staff visited the dredge site and documented the current site conditions in preparation for completing the specified O&M activities (Figure 2). The following documents the site conditions at the time and as provides an abbreviated background on the dredge site history.

Background

The U.S. Army Corps of Engineers (USACE) is required to maintain a nine-foot deep by 100-foot wide channel within the Minnesota River for barge navigation from its confluence with the Mississippi River to 14.7 miles upstream. While the USACE provides the needed channel dredging for navigation, the LMRWD serves as the local sponsor and is responsible for providing placement sites and the disposal of the dredged material. In 2007, the LMRWD acquired the land from Cargill, and in 2014 entered into an agreement with LS Marine, who also provides dredging services for the private slips at the nearby Ports of Savage, to operate the Site and find end users for the USACE dredged material on the LMRWD's behalf.

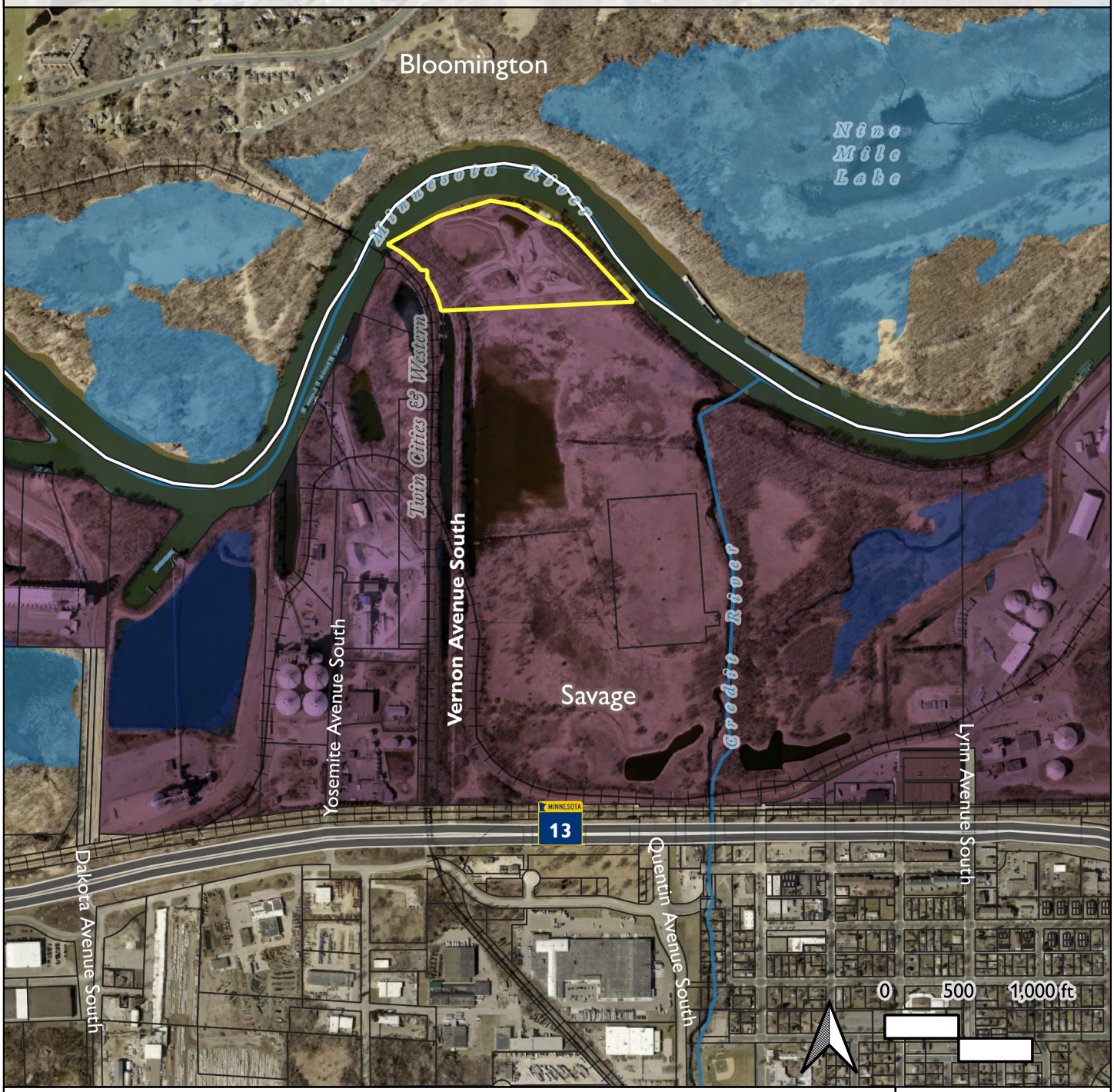
The LMRWD administrator provided the 2010 construction bid package for the Site access road developed by Bonestroo as well as a 2015 pavement evaluation report for Vernon Avenue completed by American Engineering Testing (AET). The Site access road was constructed over an existing drainage way to the Minnesota River and included a 48-inch reinforced concrete pipe culvert under the new roadway. The information provided does not show the pipe inverts; however, it appears that the pipe was placed on the existing grade and is flat, making it susceptible to sediment buildup at the entrance.

AET completed a pavement condition analysis of Vernon Avenue in June 2015 to determine if the roadway was adequate for haul trucks to remove the existing USACE dredged material stockpile on the Site. Four soil borings were collected along Vernon Avenue between Trunk Highway 13 and the Twin Cities & Western Railroad (TCWR). These borings established the roadway surface ranged from zero to 2.5 inches of deteriorated bituminous asphalt pavement. AET concluded the roadway was “in very poor condition,” the road was approaching its end of service life, and the pavement strength was not adequate for heavy truck loading (Figure 3).

As part of the planning and design efforts for the 2020 Site improvements, in 2017 Burns & McDonnell developed an Estimate of Probable Cost that estimated the cost to reconstruct Vernon Avenue to current design and strength standards was approximately $125,000. The Estimate of Probable Cost, in addition to upgrading Vernon Avenue, recommended that the 48-inch access road culvert be cleaned out and be maintained on an annual basis, likely due to its flat slope. It was further recommended that the access road culvert be removed and replaced by 2026, with an estimated cost of $103,000. It should be noted that Estimate of Probable Cost values are based on 2016 US dollars and an assumed 2.5 percent inflation rate. The estimates should be updated to reflect current construction costs if these capital improvements are pursued.

In 2020, the Site was improved to reconfigure the containment berms to segregate the sandy USACE dredged material and the more fine-grained and clayey private dredged material, which requires longer drying times. Since construction was completed, LS Marine has coordinated the placement and removal of approximately 24,000 cubic yards (CY) of USACE dredged material and 93,000 CY of private dredged materials.

Figure 1: LMRWD Dredge Site Location Map



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- LMRWD Dredge Site
- LMRWD Boundary
- Public Waterbodies
- Public Waterways
- Major Highways
- Railroads
- Scott Co. Parcels
- Ports of Savage Industrial District
- County Boundaries

LMRWD Location

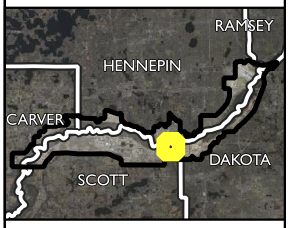

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Figure 2: Photo Locations

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- August 2022 Site Visit Photo Locations (arrow indicates view direction)
- Access Road Culvert
- LMRWD Dredge Site
- LMRWD Boundary
- Public Waterbodies
- Major Highways
- Railroads
- Scott Co. Parcels
- County Boundaries

LMRWD Location

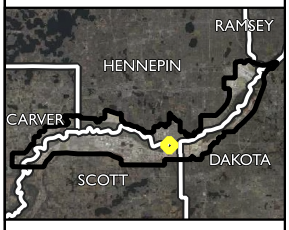

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Figure 3. 2015 Vernon Avenue pavement condition (AET, 2015)

August 22, 2022, Field Visit

On August 22, 2022, staff from Young Environmental visited the LMRWD Site and reviewed the current conditions (Attachment 1). Unfortunately, heavy vegetation entirely obscured the access road culvert and most of the roadway embankment along Vernon Avenue (Photo 1A, Attachment 1).

Consistent with the background information reviewed, Vernon Avenue was in poor condition, with many deep ruts and a deteriorating road surface (Photo 4A, Attachment 1). Much of the roadway appeared to be sandy material overlaying a decomposed bituminous pavement (Photos 1B, 2B, 3B, and 4B, Attachment 1), but large sections of the roadway appeared to be entirely sand (Photo 3, Attachment 1). Due to the road's location within the Minnesota River floodplain, it is possible that the sandy material observed is may also be sediment deposition from past flood events, which may need further soil borings or review to confirm. When compared to Figure 3 and the 2015 AET report, the 2022 field conditions appear to indicate that Vernon Avenue has continued to deterioration.

Also consistent with LS Marine's maintenance concerns, there was evidence of road widening due to displaced aggregate (Photos 1C, 2A, 4A, and 5, Attachment 1). The road widening may be intentional turnouts from the 2015–2016 stockpile removal, which would have allowed the trucks hauling sediment offsite to bypass each other on the narrow road. It is also possible that because the road surface is in such poor condition, the aggregate placed by LS Marine is not properly secured in place and gets displaced from heavy truck traffic and rainfall. If this is the case, continuing to place aggregate to fill the ruts and depressions in the roadway does not appear to be a sustainable solution and could adversely affect the neighboring wetlands over time. LS Marine should be consulted to determine if the road widening was intentional or the result of further roadway degradation.

Next Steps

Following the review of the materials provided by the LMRWD administrator and completion of the site visit, we plan to move forward as follows:

- Conduct a follow-up site visit in mid to late October 2022 when vegetation has died back to properly assess the condition of the access road culvert and its maintenance needs.
- Following the October 2022 site visit, coordinate with LS Marine and City of Savage to discuss upgrades to Vernon Avenue and gauge interest in upgrading the road as recommended by AET in 2015.
- Use the LMRWD engineering pool to update the construction cost estimates and develop a pavement design to upgrade Vernon Avenue and the access road to current design standards, which will help prevent the amount of sediment and aggregate from entering the neighboring wetlands and the access road culvert.
- Work with the selected pool engineer to collect any needed field data (e.g., soil borings) in November and December 2022.
- Develop construction bid package over the winter–spring 2023 with possible construction summer 2023.

Finally, the Minnesota Pollution Control Agency recently provided the LMRWD with an updated assessment of sediment chemical concentrations for dredged material. The updated soil reference values were provided on August 25, 2022, and will be reviewed for potential impacts to the LMRWD's dredge operations. Results of the review will be shared at the next board meeting.

Attachments

Attachment 1—August 22, 2022, Field Visit Photographs

Attachment 1: Vernon Avenue Field Visit Photos

August 22, 2022

Photo 1A. LMRWD Dredge Site access road culvert (upstream, not visible due to dense vegetation)

Photo 1B. Vernon Avenue looking north, from LMRWD Dredge Site access road. This portion of Vernon Avenue provides access to the Twin Cities and Western Railroad bridge and did not appear to be heavily trafficked. In 2015, the AET soil boring B-4 indicated the bituminous pavement was 1.5-inches thick but deteriorated.

Photo 1C. Vernon Avenue looking south from dredge site access road

Photo 2A. Vernon Avenue looking south

Photo 2B. Frog and typical Vernon Avenue road surface near Photo 2 location

Photo 3A. Vernon Avenue looking south. In 2015, the AET soil boring B-3 indicated the roadway was reduced to 0.25-inch chip seal layer atop 11.5-inches of sandy fill.

Photo 3B. Typical Vernon Avenue road surface near Photo 3 location

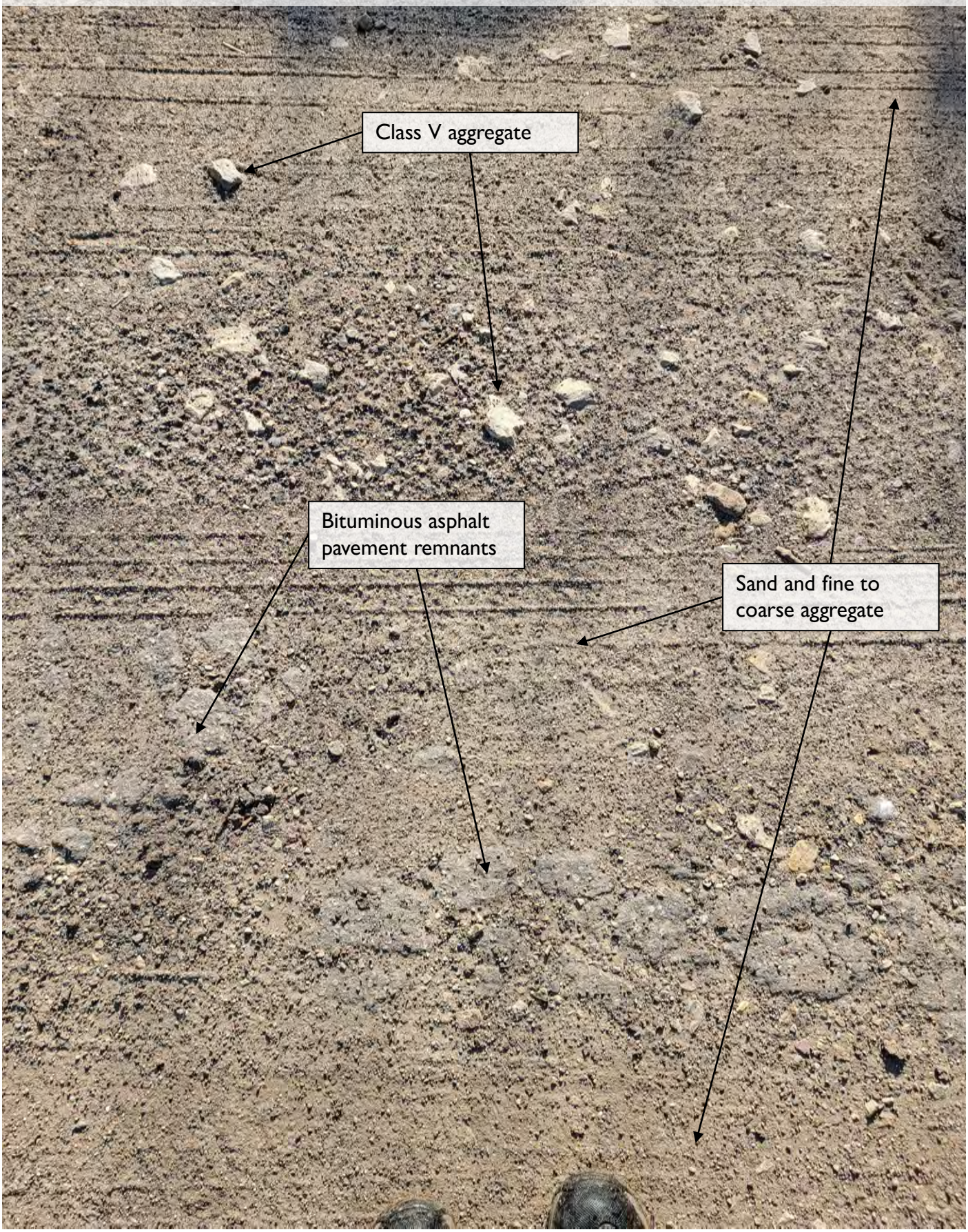

Photo 4A. Vernon Avenue settlement and rutting, looking north

Photo 4B. Close up of rutting and pavement condition, looking north

Photo 5. Vernon Avenue road widening and settlement, looking north

Photo 6. Vernon Avenue widening and settlement, looking north

Photo 7. Vernon Avenue looking south at west wetland and heavy vegetation

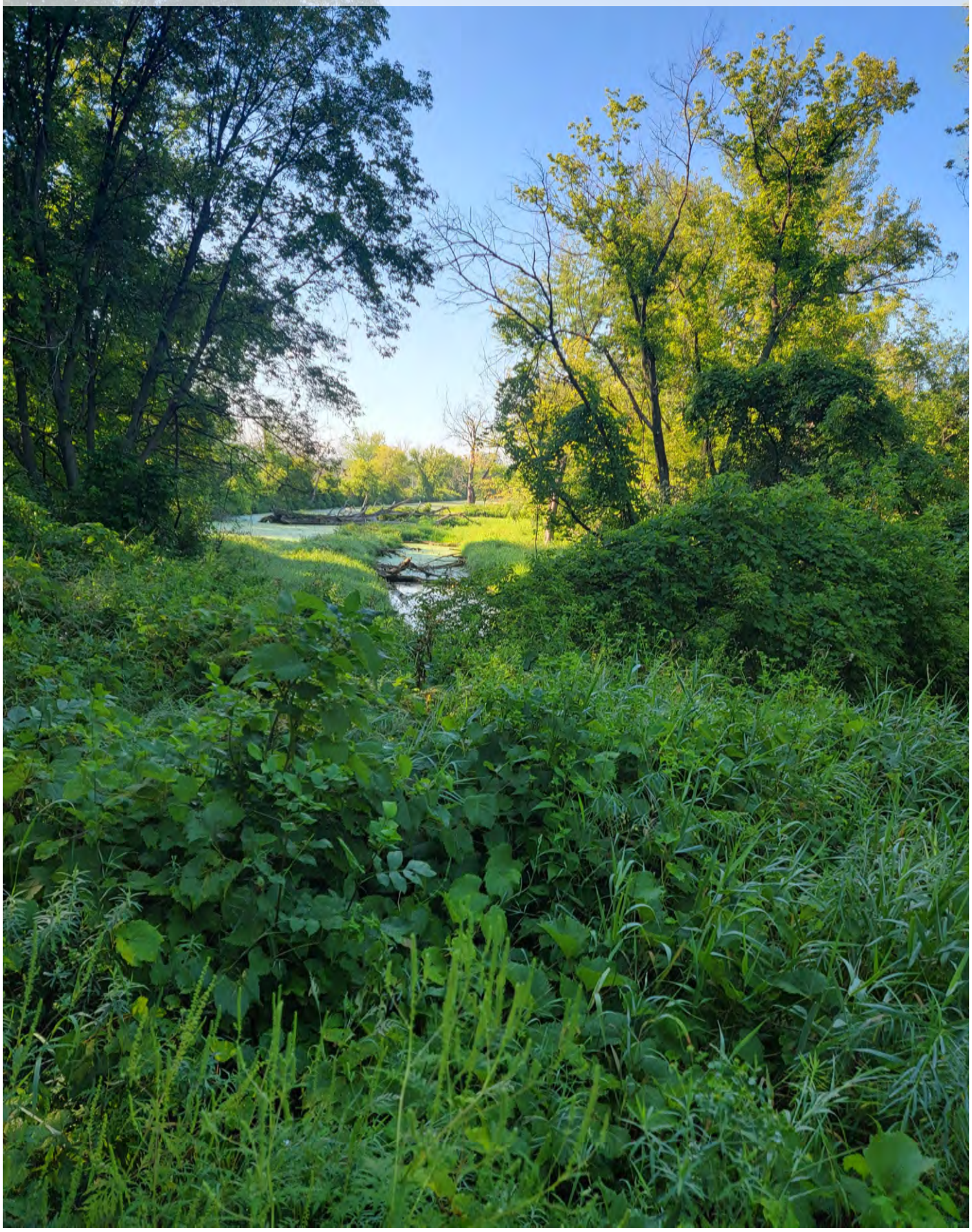

Photo 8. Vernon Avenue looking north from railroad crossing. In 2015, AET soil boring B-2 indicated the roadway had a 2.5-inch deteriorated bituminous pavement surface.