

Memorandum

To: Paul Ruesch, OSC EPA
From: John D. Jolly, VP, Program Manager
CC: Bryan Heath, Sr Environmental Manager, NCR
Date: 06/30/2023
Re: Response to RAWP Disapproval Comment #1
Kalamazoo River Superfund Site, Operable Unit 5 Area 4 TCRA

This memorandum summarizes the re-evaluation of the Area 4 time-critical removal action (TCRA) design, conducted by GEI on behalf of the Kalamazoo River Areas 2, 3, and 4 Remediation LLC (LLC) and NCR Corporation, in light of EPA's Comment #1 of the January 5, 2023 disapproval of the Operable Unit 4 Area 4 TCRA Removal Work Plan. GEI submitted the Removal Work Plan (GEI, 2022), with supporting plans and design documents, on August 15, 2022. EPA issued a disapproval letter on January 5, 2023. NCR, GEI, and EPA met on February 7, 2023 to discuss a process for responding to EPA's disapproval. NCR proposed a process for addressing the disapproval in a February 14, 2023 letter, and EPA accepted that process on February 16, 2023. In Item 3 of that process, NCR committed to re-evaluating the design in light of EPA's Comment 1 and submitting a memorandum that describes any conceptual-level changes that NCR proposes to the design. NCR also said that the memorandum would discuss how the design prevents erosion of PCBs from the banks and sediment bed, both long-term and in the period between initial placement of the proposed bank stabilization treatments and full vegetation of the treatments. Finally, NCR said the memorandum would address EPA's commentary on fish passage and public safety. This memorandum addresses all of these topics.

Background

The revised Removal Work Plan was disapproved partially based on new criteria (e.g., no longer able to use Subarea F for sediment placement and a requirement to reduce the rate of transport of downstream sediment caused by the project). The process that NCR proposed in its February 14 letter also included a step in which NCR would propose one or more conceptual alternatives to address certain other comments in EPA's disapproval, including the direction to reduce the sediment transport rate. NCR has completed that step. That step resulted in development of a revised approach, which is described in the Area 4 TCRA Recommended Alternative memorandum submitted June 30, 2023 in conjunction with this memorandum. That revised approach is the design re-evaluated in this memorandum.

This memorandum focuses on the following sentence in Comment #1:

Design revisions should be made to reduce the average bankfull velocities for every cross section within the TCRA footprint (including Schnable Brook) to < 3.5 ft/s to lower the risks to long-term channel stability and address fish passage and public safety concerns.

The direction in Comment 1 to redesign the channel to reduce bankfull velocities to < 3.5 feet per second is not necessary to assure long-term channel stability, and the design of this time-critical action should not be altered to improve fish passage or expand the area of the river that is available for recreational use. In addition, the proposed velocity standard is not consistent with previous work on the Kalamazoo River.

Velocity and Bank and Channel Stability

The EPA project team is incorrect that the modeled water velocities in the design submitted in August 2022 or the alternative approach presented in the memorandum of June 30, 2023 pose significant risk of bank instability.

As detailed in the “modeling memo” dated May 5, 2023 (GEI, 2023), bank treatments are designed to withstand erosional forces up to a 100-year storm event. Through use of erosion control blankets and specialized seed mixes, the banks are also protected while vegetation is establishing.

Exposed and graded surfaces along the banks will be seeded at appropriate seeding rates with a riparian/bank native Michigan plant seed mix that will include annual oat and rye seed. The prepared seed bed and overall subgrade will be protected using a high-strength coir erosion control blanket (ECB). The ECB serves as bank protection until permanent vegetation has filled in. Maintenance and monitoring during the temporary erosion control period will verify the establishment of both temporary (annual) and permanent (perennial) vegetation.

Both vegetated banks and banks with properly installed ECB are designed to withstand expected erosive forces. The bank treatment design was developed to withstand the modeled 100-year shear stresses from the toe to the top of the bank, which vary throughout the reach up to a maximum of 4.1 lbs/ft², and will be updated with any future changes to the design. In areas of higher stresses, the bank lifts just above the stone toe will be constructed from Bio-D block, which has unvegetated shear stress threshold of 4.5 lbs/ft². The North American Green C-125BN ECB specifies unvegetated shear stress of 2.35 lbs/ft². Vegetated coir fabric has a permissible shear stress of 4–8 lbs/ft² (Fischenich, 2001).

Also detailed in the May 5, 2023 memo, bed stability will be maximized by keying the stone toe to the alluvium, building the riffles on stable subgrade (if riffles are part of the design), and using appropriately sized stone in those features based on standard engineering practices (e.g., NRCS, 2007). As discussed in meetings with EPA on November 3, 2022 and April 13, 2023, GEI’s intent is to construct the proposed riffle and stone toes on alluvial subgrade. Given the time-critical designation of this project, the field engineering team will evaluate riffle subgrades in conjunction with EPA oversight and improve as necessary (i.e., undercutting erodible material) until stable subgrade is achieved. Similar to the riffle subgrade preparation approach, the stone toe will also be keyed into alluvium at the banks, and the engineering team will likewise ensure stone toe will be installed on stable subgrade.

Finally, the TCRA action memorandum (EPA, 2020) requires a monitoring and maintenance period, ensuring the performance of the bank treatments and stability of the channel.

Fish Passage and Public Safety

Enhancing fish passage and expanding the area of the river open to wading for the public are not requirements of the TCRA memorandum (EPA, 2020). Indeed, the action memorandum says nothing about improving fish passage or wading/boating safety.

This is not surprising because improving fish passage and expanding recreational use are not recognized purposes of a TCRA under the National Contingency Plan (NCP), which specifies that the goal of a removal action is “to abate, prevent, minimize, stabilize, mitigate, or eliminate the release or the threat of release.” [40 C.F.R. § 300.415(b)(1)]. The purpose of the TCRA is to “mitigate threats to public health, welfare, and the environment upstream of the Trowbridge Dam posed by the ongoing uncontrolled releases of PCBs and potential for further uncontrolled release of high levels of PCBs . . . from instream sediments and riverbank/floodplain soils of the Kalamazoo River at the Trowbridge Dam area” (EPA, 2020).

As noted below, the Area 3 TCRA did not meet a standard of < 3.5 feet per second on average during bankfull flow, as evidenced by modeling and post-removal field measurements (Amec Foster Wheeler,

2017; Tetra Tech, 2018). This was appropriate for the work performed in Area 3 because fish passage is not a consideration for a TCRA.

The Area 4 TCRA action memorandum does not identify a state ARAR related to fish passage or public safety, nor does it mention a federal ARAR. State ARARs are defined as statutes. State guidance or preferences of state officials are not ARARs. This also applies to statements in Comment #1 regarding bank-height ratios and entrenchment ratios. Indeed, the EPA said, in response to State comments, that “EPA has not identified any State ARARs in relation to the TCRA.” (EPA Ltr. to State, 1-10-2023, Resp. to State Comment 78.)

In any case, both the design submitted to EPA in August 2022 and the alternative approach now being re-evaluated significantly improve fish passage in the river. Under current conditions, the dam prevents all fish passage upstream. Removing the dam as part of the TCRA will improve fish passage. Improving passage even more than what the dam removal will accomplish is not necessary to “mitigate threats to public health, welfare, and the environment” from PCBs.

Furthermore, both the design submitted to EPA in August 2022 and the alternative approach now being re-evaluated significantly improve safety by removing the Trowbridge Dam. Trowbridge Dam is one of multiple low-head, high-hazard dams on the Kalamazoo. As showcased in a recent safety meeting presented by WSP and attended by stakeholders, low-head, high-hazard dams are a substantial safety risk for numerous reasons, including the condition of the drop and subsequent hydraulic at the base of the dam.

In conclusion, the alternative design approach described in our Area 4 TCRA Recommended Alternative memorandum will successfully meet the requirements of the NCP, Consent Decree, and TCRA memorandum. Through a review of the EPA’s comments and suggestions, the following changes will be considered as the alternative design approach is developed to a final design:

- Engineered riffles, where necessary, will be constructed on stable subgrade.
- PCB dredge prisms will be adjusted to correct for discrepancies uncovered with boring 4S-PC-01-2 and 4S-EI20-1.
- Bank treatments at river mile (RM) 45.3, RM 45.32, and RM 46.36 will be adjusted approximately 1 foot higher on the bank.
- The extent of Treatment “B” at RM 45.2 will be extended 100 feet farther downstream.

In addition to these changes, more design and modeling will be necessary to develop the alternative design approach into a final design. As a result, other design modifications may be required and will be included in a revised design.

Consistency with Previous Work

The proposed velocity standard is also not consistent with previous work on the Kalamazoo River. In particular, velocity calculations associated with the Area 3 TCRA show the design of that project resulted in bankfull velocities that are significantly higher than EPA now proposes to require. For example:

- The Area 3 TCRA design showed modeled velocities up to 5.5 feet per second at average flow, and up to 10.5 feet per second at bankfull flow in the vicinity of the former dam (Amec Foster Wheeler, 2017).
- In 2018, velocities measured in Area 3 following implementation of the TCRA showed average transect velocities close to 3.5 feet per second at some locations at a flow slightly higher than average flow and less than bankfull flow (Tetra Tech, 2018). Also note that those velocity measurements were not collected at the known highest velocity locations in Area 3 (the riffle at the former dam, and the “narrows” near river mile 50.2).

Conclusion

The revised design approach for the Area 4 TCRA was re-evaluated in light of EPA's Comment 1. While we agree that short- and long-term stability of the banks and sediment bed is an appropriate design criterion, the re-evaluation concludes that the revised design approach meets that goal even though not all areas of the river would have bankfull velocities below 3.5 feet per second. In contrast, improving fish passage and expanding recreational use of the river are not appropriate design criteria for a time-critical removal action, and we do not propose to revise the design to include those criteria. Finally, the Area 3 TCRA provides precedent for recognizing that stability of the banks and sediment bed does not require reducing bankfull velocity in all areas to below 3.5 feet per second. As a result, we conclude that the revised design approach is appropriate and should be developed further into a final design.

References

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