

October 4, 2023

Via Electronic Mail

Paul Ruesch, On-Scene Coordinator
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Chicago, IL 60604-3590

Area 4 TCRA Removal Work Plan Part 1

Dear Mr. Ruesch:

Pursuant to EPA's letter dated August 4, 2023, NCR (through the Kalamazoo Areas 2, 3 and 4 TCRA LLC and its contractor GEI Consultants, Inc.) is submitting a draft Removal Work Plan ("RWP") for "Part 1" of the time-critical removal action ("TCRA") work in Area 4 of Operable Unit 5. As directed in EPA's August 4 letter, the RWP includes, among other work items: (1) installation of the temporary water control structure; (2) dredging and off-site disposal of PCB-contaminated sediments; and (3) installation of temporary riverbank stabilization measures.

In the August 4 letter, EPA expressed the expectation that the Part 1 work will begin no later than February 1, 2024. The RWP includes a schedule that meets this expectation. However, that schedule depends on prompt approval of the RWP. Our team is ready to answer any questions you may have to expedite EPA's review of the RWP.

In addition, we expect that close coordination among NCR's team (including the LLC and GEI), EPA, and the contractor hired to perform the work will be needed to conduct the Part 1 work successfully. Both the details of implementation and the schedule provided in the RWP will be adjusted based on input from the contractor, once selected.

Finally, as you know, the August 4 letter set a work plan submission date only for Part 1 of the TCRA. On January 5, 2023, EPA disapproved a prior removal work plan that addressed all elements of the TCRA, both those that are now in Part 1 and those that are now being called "Part 2." In March 2023, NCR and EPA agreed on a schedule of activities that included a due date for resubmission of the overall work plan. That due date was tied to EPA's response to a technical memorandum that NCR submitted on June 30, 2023.

In the August 4 letter, EPA stated that it did not intend to respond to NCR's June 30 memorandum; as a result, no work plan submission date currently is in place for Part 2. NCR believes that it is vital to receive a decision from EPA on the content needed for a Part 2 work

Mr. Ruesch
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plan before construction work begins on Part 1, so that we can ensure that work does not stop in between the two parts of the TCRA.

We understand that you plan to provide us shortly with a proposed schedule for discussing the relevant issues and then providing a decision on the content for Part 2. We further understand that EPA plans to issue the final schedule for those activities in its approval letter for today's RWP. We look forward to receiving the proposed schedule, and we will provide input promptly.

If you have any questions or comments regarding the enclosed draft RWP, please feel free to contact the GEI team or me at your convenience.

Regards,

A handwritten signature in blue ink, appearing to read "Bryan Heath", with a long horizontal stroke extending to the right.

Bryan Heath

Attachments: A4 TCRA Removal Work Plan Part 1, Draft

Copies via electronic mail to:
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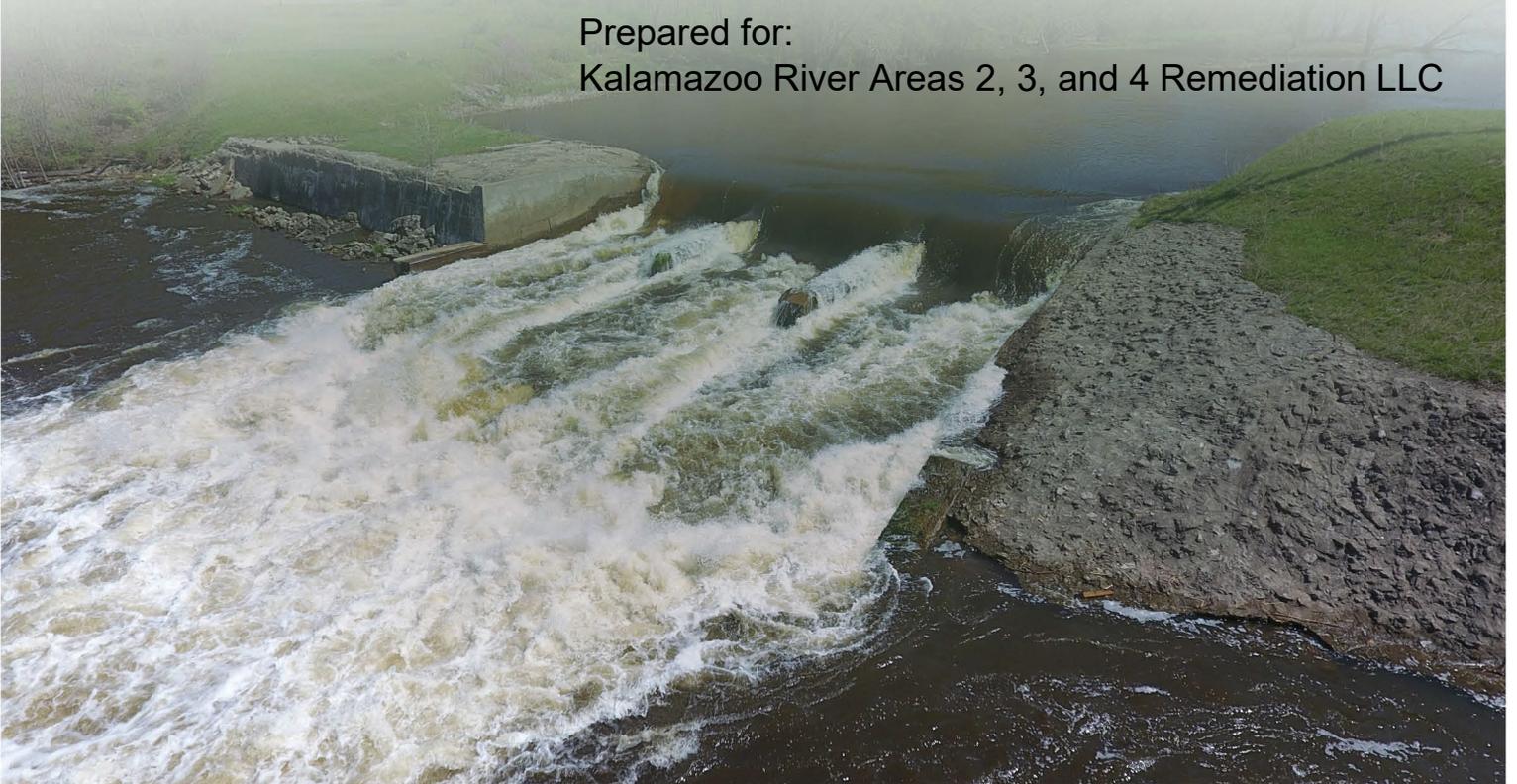
October 4, 2023



Removal Work Plan Part 1, Draft

OU5 Area 4 Time-Critical Removal Action
Allied Paper/Portage Creek/
Kalamazoo River Superfund Site

Prepared for:
Kalamazoo River Areas 2, 3, and 4 Remediation LLC





Removal Work Plan Part 1, Draft

OU5 Area 4 Time-Critical Removal Action Allied Paper/Portage Creek/ Kalamazoo River Superfund Site

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October 4, 2023

GEI Project No. 2000273

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Abbreviations and Acronyms

ACRC	Allegan County Road Commission
Amec	Amec Foster Wheeler
ARAR	Applicable or Relevant and Appropriate Requirement
BMP	best management practice
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CQCP	Contractor Quality Control Plan
DMP	Data Management Plan
EGLE	Michigan Department of Environment, Great Lakes, and Energy
EPA	United States Environmental Protection Agency
FSP	Field Sampling Plan
HASP	Health and Safety Plan
LLC	Kalamazoo River Area 2, 3, and 4 Remediation LLC
MBPI	Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians of Michigan
mg/kg	milligrams per kilogram
mg/m ³	milligrams per cubic meter
MDNR	Michigan Department of Natural Resources
MDOT	Michigan Department of Transportation
MNFI	Michigan Natural Features Inventory
NHBP	Nottawaseppi Huron Band of Potawatomi
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NREPA	National Resources and Environmental Protection Act
OSHA	Occupational Safety and Health Administration
OU5	Operable Unit 5
PCB	polychlorinated biphenyl
PDI	pre-design investigation
QAPP	Quality Assurance Project Plan
QMP	Quality Management Plan
RM	river mile
ROW	right of way
SESC	Soil Erosion and Sedimentation Control Plan
SRI	supplemental remedial investigation
SSP	steel sheet pile
START	Superfund Technical Assessment and Response Team
SWAC	surface-weighted average concentration
TBC	to be considered

TCRA	Time-Critical Removal Action
TSCA	Toxic Substances Control Act
USFWS	U.S. Fish and Wildlife Service
WCS	water control structure
WTS	water treatment system

1. Introduction

1.1 Project Background and Scope

GEI Consultants of Michigan, P.C. is pleased to provide this Removal Work Plan for a Time-Critical Removal Action (TCRA) for Part 1 of Area 4 of Operable Unit 5 (OU5) of the Allied Paper/Portage Creek/Kalamazoo River Superfund Site (Site). This work will be performed by GEI on behalf of the Kalamazoo River Areas 2, 3, and 4 Remediation LLC (LLC), which NCR Corporation formed to meet certain requirements of the Consent Decree (CD) between NCR Corporation, the United States Environmental Protection Agency (EPA), and the State of Michigan.

The CD was lodged in December 2019 and entered (approved) by the United States District Court for the Western District of Michigan on December 2, 2020. The CD requires NCR to conduct response activities in Areas 2, 3, and 4 of Operable Unit 5 of the Allied Paper/Portage Creek/Kalamazoo River Superfund Site. Work activities described by the CD include performance of a TCRA in Area 4 and remedial design and remedial action in Areas 2 and 3.

1.2 Removal Work Plan Scope

Area 4 is divided into eight subareas between the former Otsego Township Dam (river mile [RM] 49.6) and the Trowbridge Dam (RM 44.9) (Figs. 1 and 2). However, Area 4 TCRA work as defined in the Area 4 Action Memorandum (EPA, 2020) is limited to a 2.4-mile stretch of the Kalamazoo River between RM 47.25 and the Trowbridge Dam. This Removal Work Plan has been amended to discuss a subset scope of work to the overall TCRA (referred to herein as Part 1 TCRA) as detailed in the EPA letter dated August 4, 2023 (EPA, 2023). This revised scope is reflected in the design and work plans, and further details regarding the Part 1 TCRA scope of work are provided in Section 3. A Part 2 of the TCRA will be needed to complete the scope of work described in the TCRA Memorandum.

1.3 Project Schedule

A draft project schedule for Part 1 Area 4 TCRA work is provided in Fig. 3. Part 1 is presented as work contained in the letter of August 4, 2023. Schedule refinements may be necessary due to several conditions, including contractor constraints, weather, field conditions, and access challenges. The schedule will be updated routinely as part of monthly progress reporting and provided to EPA for review.

1.3.1 Transition to Part 2 Work

The work discussed in this work plan is Part 1 of the effort described in the TCRA action memorandum (EPA, 2020). Significant design work has been done on the next phase of work, Part 2, including submission of a work plan in August 2022 that covered both parts of the TCRA work. Following EPA's disapproval of that work plan, technical memoranda were submitted to EPA containing proposals for key aspects of the Part 2 work, most notably management of post-dredge sediments and requirements for channel stability after TCRA completion. To ensure a safe and proper transition from Part 1 to Part 2 work, it is important to obtain an EPA decision on those aspects of the design so the remaining Part 2 design can be completed.

If EPA decisions are not provided in a timely manner, delays may be experienced in contractor selection, material procurement, and work implementation in the field. These time delays would also cause additional costs for items such as material procurement, additional field mobilizations, and maintenance of temporary controls installed as part of Part 1 of the TCRA as well as other costs that are unrealized at this time.

1.4 Project Organization

Project organization and roles for GEI; EPA; the Michigan Department of Environment, Great Lakes, and Energy (EGLE); and the Michigan Department of Natural Resources (MDNR) are provided in Fig. 4.

2. Site Background

2.1 Location and Current Site Description

Area 4 of OU5 includes approximately 4.7 miles of the Kalamazoo River, its floodplain, and the current and former impounded areas (commonly referred to as the Trowbridge impoundment) between the upstream former Otsego Township Dam (RM 49.6) and the downstream Trowbridge Dam (RM 44.9) (Fig. 1).

The Trowbridge Dam, which will be removed during future work following Phase 1 TCRA completion, was built in 1898 to generate hydroelectric power and was operated from 1902 to 1967, when Consumers Power gifted it to the State of Michigan. MDNR currently owns and manages the dam for the people of the State of Michigan. The dam's powerhouse was demolished and the gates were removed to lower the impoundment level in the 1970s. In 1986, the remainder of the dam's superstructure and spillway gates were removed, and its concrete piers and abutment walls were lowered. The dam, as it exists today, consists of a 150-foot left earthen embankment, 80-foot-wide concrete spillway, and a 110-foot right earthen embankment, for a total length of approximately 340 feet. In its current condition, the dam creates a hydraulic head of approximately 11 feet, a minimum freeboard of 3 feet during base flow, and an impoundment area of approximately 59 acres (AECOM, 2019a).

The dam had been in poor condition and was at risk for failure if flood flows exceeded a 5-year event (DNR, 2005). In 2019, the State of Michigan installed steel sheet piling and grouted riprap to reduce the risk of a dam breach and accommodate flood flows up to the 200-year event. The improvements were detailed in the design report and drawings prepared by AECOM (AECOM, 2019a, 2019b). The improvements (identified as Phase 1A improvements by AECOM) did not change the normal hydraulics but allowed for flood flows to overtop the powerhouse section (at approximate 5-year flood flow). Following completion of the Phase 1A improvements, EGLE Dam Safety upgraded the Trowbridge Dam condition to "Fair."

Dam Safety, a unit of Michigan's Water Resource Division performed inspections on November 3, 2022 and August 18, 2023 on the State-owned Trowbridge Dam (Dam ID NO. 604). The 2022 report downgraded the dam from "Fair" to "Poor" (EGLE, 2022a). In letter reports to Department of Natural Resources dated December 1, 2022, and September 19, 2023, priority lists of items for evaluation, maintenance, and monitoring were identified (EGLE, 2022b, EGLE 2023). To date the recommended maintenance and monitoring activities have not been performed.

Currently, Area 4 is characterized by a single main channel. Tributaries to the Area 4 channel include Schnable Brook and Osgood Drain, which flow into the Kalamazoo River at approximately RM 46.6 and RM 45.15, respectively. A side channel and several frequently inundated floodplain areas are located in the downstream portion of the impoundment between RMs 45.25 and 46.25. Under normal flow and dam-in conditions, the Area 4 river water surface covers approximately 157 acres with a 100-year floodplain of approximately 411 acres (Amec Foster Wheeler, 2018). These physical characteristics of Area 4 have been largely influenced and created by the Trowbridge Dam. After the Trowbridge Dam was lowered in the early 1970s, Area 4 has become increasingly channelized with exposure of former sediments and wetlands. Additionally, since the removal of the Otsego Township Dam, sediment that had accumulated behind the dam has been transported downstream to both the Trowbridge impoundment and beyond Trowbridge Dam. Exact quantities for these sediment pathways are unknown.

The main channel of the Kalamazoo River and its adjacent relatively undeveloped riverine corridor comprise Area 4. Predominant land cover types along the river include open water, emergent marshes, forested floodplains, and upland forest. The Kalamazoo River through Area 4 has been historically impounded at different elevations over time. The vast majority of the property within Area 4 is unimproved recreational land managed in trust by MDNR as part of the Allegan State Game Area. There are several small privately owned parcels located within the Area 4 TCRA boundaries, but no residences are situated within their limits. Further details regarding human health risks to surrounding receptors are provided in Amec Foster Wheeler's (Amec) 2018 Supplemental Remedial Investigation (SRI) Report (Amec Foster Wheeler, 2018).

Area 4 is divided into the following eight Subareas (Fig. 2):

1. Subarea A extends from the former Otsego Dam downstream to approximately RM 48.35, which is near the upstream extent of the historical impoundment of the Trowbridge Dam.
2. Subarea B extends from Subarea A (RM 48.35) downstream to approximately RM 47.25, which is the approximate upstream extent of the current Trowbridge Dam impoundment.
3. Subarea C extends from Subarea B (RM 47.25) downstream to approximately RM 46.65, which is just upstream of the mouth of the Schnable Brook tributary.
4. Subarea D extends from Subarea C (RM 46.65) downstream to approximately RM 45.70, where a change in sediment PCB concentration

patterns was observed based on historical sampling data (Amec Foster Wheeler, 2018).

5. Subarea E extends from Subarea D (RM 45.70) downstream to the Trowbridge Dam (RM 44.9).
6. Subarea F includes the side channel south of Subarea E.
7. Subarea G includes the backwater area on the eastern floodplain north of Subarea E.
8. Subarea H includes the areas of inundation along Schnable Brook east of Subarea D.

Part 1 TCRA work will be limited to Subareas C, D, E, and portions of G, as detailed in Section 3.

2.2 Investigations Prior to the TCRA

Multiple government and private entities have performed several investigations throughout Area 4 since the early 1990s. The studies were performed for multiple purposes including PCB delineation, soil and sediment characterization, ecological and human health risk assessments, and river hydrological and hydraulic modeling. Prior to 2020, the most recent Area 4 investigation was conducted by Amec on behalf of Georgia Pacific throughout 2014 and 2015. The purpose of the investigation was to 1) develop a conceptual site model that detailed PCB distributions in Area 4 soils, sediment, and biota; and 2) determine the fate and transport processes contributing to these distributions. During this time, Amec collected more than 1,200 sediment samples from 212 sediment cores, and more than 1,600 soil samples from 354 soil cores. Those samples were in addition to the more than 1,500 sediment, soil, surface water, and biota samples previously collected by others in Area 4. Detailed summaries of these previous investigations by Amec and others were approved by EPA and are provided in Amec's 2018 SRI (Amec Foster Wheeler, 2018) and the 2020 Action Memorandum (EPA, 2020).

3. Part 1 TCRA Approach

As outlined in the Action Memorandum (EPA, 2020), the TCRA involves the following tasks:

1. Dredging (mechanical and/or hydraulic) of PCB-impacted in-stream sediments and excavation of riverbank/floodplain soils with PCB concentrations exceeding cleanup standards.
2. Removing the Trowbridge Dam including the 150-foot southern earthen embankment, 80-foot-wide concrete spillway, and 110-foot northern earthen embankment. A cofferdam/water control structure (WCS) will be needed to manage the drawdown, remove the dam structures, and minimize the risk of PCB mobilization from floodplains and banks.
3. Cutting-back and stabilizing the riverbanks to mitigate potential erosion of PCB-impacted bank material.
4. Dewatering, as necessary, and disposal off-site of PCB-impacted in-stream sediments and riverbank soils removed in accordance with the tasks listed above. PCB-impacted material with PCB concentrations ≥ 50 mg/kg shall be transported off-site to a Toxic Substances Control Act (TSCA) waste landfill that follows all state and federal regulatory requirements. PCB-impacted material with PCB concentrations < 50 mg/kg and ≥ 1.0 mg/kg (in-stream sediments) or ≥ 5.0 mg/kg (riverbank soils and incidental floodplain soils removed for bank stability reasons) shall be transported off-site and disposed in an appropriately licensed and permitted commercial landfill in compliance with all state and local laws.
5. Preparing stable banks along the river channel after dam removal, including excavating the existing banks and backfilling with engineered fill (sloping) as appropriate, and revegetating banks with native plant species.
6. Conducting appropriate monitoring and maintenance both during the TCRA and for a defined time period after completion of the work described above.

3.1 Part 1 TCRA Scope

Part 1 TCRA scope includes items listed in EPA's August 4, 2023 letter. Remaining items listed in the TCRA Memorandum will be addressed in Part 2 of the TCRA and will be described in a separate work plan. The Part 1 TCRA scope of work as detailed in the August 2023 EPA Letter (EPA, 2023) is limited to the following:

1. Installation of a temporary water control structure.
2. Dredging and off-site disposal of PCB-impacted sediments (i.e., in-stream sediment exhibiting PCB concentrations of ≥ 1.0 milligrams per kilogram mg/kg).
3. Installation of temporary riverbank stabilization measures in necessary subareas to prevent erosion of PCB-impacted floodplain and bank soils/near bank sediments into the sediment dredge footprint.

The sediment dredging component of Part 1 TCRA will be conducted in those areas of Subareas E and G depicted in Fig. 5.

In-stream sediment PCB concentrations are potentially impacted by bank instability and erosion. To limit movement of PCB-impacted bank material into the channel following PCB-impacted sediment removal, select banks in Subareas C, D, and E will be temporarily stabilized using near-bank turbidity screens. Sheet piling will be installed along portions of Subareas F and G (Fig. 6).

Following water level lowering and Trowbridge Dam removal in Part 2 to complete the TCRA, it is anticipated that portions of Subareas F and G that are at present routinely inundated will drain and revert to upland floodplain. Impacts within these areas will be addressed during future floodplain work.

A water control structure will be installed during Part 1 TCRA work to manage the drawdown of the impoundment during the remaining Part 2 TCRA scope of work, (including dam removal and bank stabilization).

To achieve the tasks discussed above, GEI collected additional soil and sediment PCB data; completed hydraulic, geotechnical, and structural analyses; and developed plans and specifications to support the 30%, 60%, and final draft designs for contractor procurement for the Area 4 TCRA as described in the following sections.

See Appendix A for the anticipated sequence of work for Part 1 TCRA.

3.2 Cleanup Standards

As stated in the Area 4 TCRA Action Memorandum, the EPA established an in-stream sediment cleanup standard of ≤ 1.0 mg/kg (EPA, 2020). By removing in-stream sediments with PCB concentrations ≥ 1.0 mg/kg, and future riverbank soil removal of PCB concentrations ≥ 5.0 mg/kg, EPA expects to achieve a surface-weighted average concentration (SWAC) of ≤ 0.33 mg/kg total PCBs for in-stream sediments.

4. Pre-Design Investigation

As discussed in Section 3.0, Part 1 TCRA work will consist of a partial scope of work to the overall TCRA. The following section discusses pre-design investigation activities completed to date for the TCRA.

Based on available data from WSP (formerly Wood, formerly Amec) and others, initial bank soil and in-stream sediment removal areas were developed. However, additional PCB delineation data were necessary to refine the proposed removal footprints. Pre-design investigation (PDI) data also were needed to support river hydraulic modeling, riverbank restoration design, temporary earth-support structure design, and Trowbridge Dam removal.

PDI tasks and objectives from Phase 1 and 2 included the following:

1. Refine the horizontal and vertical extent of PCBs in bank soils and near-bank sediments in Subareas C, D, and E with PCB concentrations equal to or greater than the cleanup standards of 5.0 mg/kg and 1.0 mg/kg, respectively. These data were used in coordination with historical data (as applicable) to define the bank segments requiring removal to meet the TCRA cleanup standards. Historical data were included except for bank areas showing signs of recent erosion.
2. Refine the horizontal and vertical extent of PCBs in current in-stream sediments in Subareas E, F, and G with PCB concentrations equal to or greater than the cleanup standards of 1.0 mg/kg. These data were used to define the dredge prisms requiring removal to meet the cleanup standards intended to achieve the post-removal SWAC standard. Historical sediment data were used for sampling design purposes only, because older sediment data were unlikely to be representative of sediment conditions at the time of the PDI.
3. Verify and delineate the extent of sediments or bank-soil locations within the TCRA boundary with ≥ 50 mg/kg PCBs requiring separate handling and disposal under TSCA regulations.
4. Gather geotechnical engineering properties of sediments and soils to evaluate bank and slope stability under current and post-removal conditions and to design temporary support structures (e.g., cofferdams) that may be needed to complete the channel construction and restoration efforts.

5. Determine the current channel flow patterns and location of coarse-textured sediment deposits below soft impoundment sediments to serve as the basis for constructing the post-dam removal thalweg.
6. Gather river velocity and stage data to conduct hydrodynamic and sediment transport modeling for current and post-dam removal scenarios. Hydraulic and sediment transport modeling assisted in determining the sequencing of work phases and understanding what seasons are amenable to specific dredging and excavation construction means and methods.
7. Perform a bathymetric survey and sediment thickness poling for Area 4 to assess sediment elevations and thicknesses, particularly in proximity to Trowbridge Dam and the 26th Street Bridge. The bathymetric survey data were used to quantify removal volumes (dredge prisms) and to support sediment transport modeling.
8. Perform a bathymetric survey across Area 3 from the former Otsego Dam to the M-89 Bridge Crossing. The bathymetric survey data was used to estimate the following:
 - The volume of sediment transported into Area 4 since removal of the Otsego Dam during the Area 3 TCRA to understand the accretion volumes.
 - The volume of remaining sediment that will likely be transported downstream into Area 4.
9. Collect river turbidity data to identify background turbidity levels and establish baseline conditions. Baseline conditions will be used for monitoring purposes during future intrusive work.

A third PDI phase of work was conducted to characterize post-dredge sediment for objectives not related to PCB delineation or removal.

To perform these tasks in accordance with EPA requirements, GEI developed a Field Sampling Plan (FSP) (GEI, 2020c) with several addenda, and an area-specific Quality Assurance Project Plan (QAPP) (GEI, 2022d). Results of the PDI were presented in the “Pre-Design Investigation, Phase 1 and Phase 2, Data Summary Report” (GEI, 2022e) and “Pre-Design Investigation, Phase 3 Data Summary Report” (GEI, 2023a).

5. Time-Critical Removal Action Part 1 Tasks

The following sections discuss the specific actions required in Part 1 TCRA scope of work, as detailed in Section 3.1 and reiterated below:

1. Installation of temporary riverbank stabilization measures in necessary subareas to prevent erosion of PCB-impacted floodplain and bank soils/near-bank sediments into the sediment dredge footprint.
2. Dredging and off-site disposal of PCB-impacted sediments.
3. Installation of a temporary water control structure.

The proposed sequence of work for the Part 1 TCRA is provided as Appendix A, and is a subset of the previously submitted TCRA design drawing package. As shown in the sequence of work drawings, temporary riverbank stabilization measures will be installed before dredging to help mitigate migration of remaining PCB-impacted material into the main river channel both during and following dredging. These stabilization measures will be left in place until the remaining TCRA scope of work is completed during separate future mobilization(s). Dredging will then be performed from upstream to downstream according to the provided sequence.

Dredge footprints have been established for delineated impacts ≥ 50 mg/kg and ≥ 1 mg/kg PCBs, and for Beaver Island. As stated in Stage 5 of the sequence of work drawings, Beaver Island and its surrounding area will be dredged/excavated and stockpiled with the intention of reuse within the site boundary. A similar path for reuse of non-PCB-impacted soil for the left descending bank soil adjacent to the primary spillway is planned for Part 2.

The water control structure will be installed after completion of dredging. Associated Part 1 TCRA mobilization, site preparation, restoration, and maintenance and monitoring are discussed in the following sections.

5.1 Mobilization, Site Set-Up, and Pre-Construction Procedures

5.1.1 Site Security

Access pathways established as part of the Part 1 TCRA will be controlled and managed throughout the duration of the TCRA, including both Part 1 TCRA efforts and future work to complete the TCRA. Fencing and gates will be installed at entrances to the access roads and staging areas. Contractor personnel/flagmen will manage traffic at the entrances/exits to public roads as required. Signs will be

posted on site fencing and upstream of Area 4 within the waterway to discourage trespassing. Additional details regarding site security are available on the design drawings and in the Site Security Plan (GEI, 2020d).

5.1.2 Project Stationing

To facilitate reference locations during construction, river stationing will be established within Area 4 based on the current river mile marker alignment. Stationing along the alignment will range from approximate RM 44.9 at the Trowbridge Dam to approximate RM 49.5 at the former Otsego Township Dam.

5.1.3 Clearing and Grubbing

Areas needed for staging and access roads will be cleared and grubbed using conventional earthwork techniques. Construction of staging areas or access roads may require use of private property from roadways to the river. GEI will coordinate with EPA to obtain “consent to access” forms from private property owners prior to any access on private land(s).

To comply with regulations and best management practices (BMPs) for federally endangered and threatened species potentially occurring at the Site (Indiana bat, northern long-eared bat), EPA and the MDNR will be consulted regarding proposed clearing and grubbing areas, schedules, and sequencing. Additionally, MDNR will be consulted to provide input on the value and quality of trees and vegetation within the proposed access road and staging area footprints. To the extent possible, areas requiring minimal disturbance will be given priority over heavily vegetated or forested areas for site access and staging. Cleared and grubbed areas will be stabilized in accordance with the forthcoming Soil Erosion and Sedimentation Control Plan (SESC) to minimize erosion.

Cleared and grubbed material (above the root ball) will be reused for site stabilization and restoration when possible. Additional details regarding reuse of cleared and grubbed material will be provided in the Waste Management Plan.

5.1.4 Access Road and Staging Area Construction

Performing the Part 1 TCRA will require construction of multiple staging areas and access roads following clearing and grubbing (Fig. 7). Access roads include roads that extend from existing public roadways to the general vicinity of the river. Haul roads are considered roads constructed parallel to the river. The access and haul roads will be constructed using conventional earthwork techniques utilizing road base materials (granular fill and dense graded aggregates) with a geotextile separation fabric placed on the exposed subgrade. Additional subgrade

improvement such as “corduroy” techniques or the incorporation of high-strength fabrics / geogrid may be required in overly soft or wet subgrade areas. Where necessary, drainage structures such as culverts or drainage swales will be installed within concentrated flow path crossings.

Staging areas will be constructed in locations where they can connect to access roads and will be used for equipment and material staging, stabilization/load-out pads, sediment dewatering, and water treatment. It is expected that the southern bank adjacent to Trowbridge Dam will serve as the primary staging and dredge sediment management area for Part 1 TCRA removal efforts. This general area has been cleared and graded to include approximately 8 acres; however, the area will require additional earthwork and site balancing during site preparation and dredge pad construction.

Prior to access road and staging area construction, existing conditions within the proposed construction footprints will be documented to aid in final site restoration of the affected areas. Additionally, as-built extents of access roads and staging areas will be surveyed and documented. Access roads and staging areas will be left in place following completion of the Part 1 TCRA for use during remaining TCRA efforts.

5.1.5 Turbidity Controls

Temporary turbidity controls will be evaluated as means of controlling sediment transport during in-stream sediment dredging. Turbidity curtains, turbidity screens, and temporary steel sheet pile cofferdams, as appropriate, will be evaluated as means of isolating impacted material and preventing redistribution of impacted material following dredging. To minimize downstream impacts during dredging, a series of turbidity controls will be installed to manage the active dredge work.

Turbidity will be monitored throughout dredging as described in Section 5.2.2. Additional details regarding turbidity monitoring and controls are provided in the Field Monitoring Plan (GEI, 2022b) and the forthcoming SESC Plan.

5.1.6 Contact Water Management and Treatment System

Temporary water treatment systems (WTS) will be used to treat contact water generated during sediment excavation and material dewatering/drying. Water will primarily be treated using a combination of filtration and activated carbon unit processes.

Details regarding WTS sampling will be provided in the Waste Management Plan. Based on the work conducted during the TCRA in Area 3, it is anticipated that

weekly WTS influent and effluent samples will be analyzed in accordance with the substantive requirements document of National Pollutant Discharge Elimination System (NPDES; see section 7.1.1). Regular discharge monitoring reports will be generated to document the operation and maintenance of the treatment systems.

WTS effluent meeting substantive requirement monitoring procedures and discharge criteria will be considered for on-site reuse including decontamination procedures and dust control. These potential alternative WTS effluent uses will be communicated to EPA.

5.1.7 Decontamination Procedures

To prevent unintended movement of impacted materials both on- and off-site, decontamination procedures will be followed for both active removal areas and heavy equipment involved in removal activities. Exclusion zones will be established with personnel decontamination stations at the exclusion zone entrance/exit. Water generated during decontamination will be captured and conveyed to the on-site water treatment systems. Further discussion on decontamination procedures will be provided in the design specifications and the Waste Management Plan.

To minimize the spread of invasive plant and animal species to and from the site, contractors and other field staff will be required to follow decontamination procedures developed by the State of Michigan (EGLE, 2014). When necessary, site-specific protocols will be developed based on this policy, depending on the specific work activity and the invasive species present in work areas.

5.2 Field Monitoring

5.2.1 Air Monitoring

Air quality standards for perimeter air monitoring during the Part 1 TCRA will be established in accordance with the National Ambient Air Quality Standards. Project air quality standards will be risk-based limits protective of human health for air emissions associated with Part 1 TCRA removal efforts. Air quality standard development and air monitoring will be performed by EPA Superfund Technical Assessment & Response Team (START) contractors.

It is anticipated that air monitoring stations will be set up daily at the perimeter of work area(s) during dredging and/or loading of PCB-impacted materials and relocated as necessary as work progresses. However, air monitoring may be suspended in the event of inclement weather or work cancellation. An automated notification system will be established to inform relevant parties if dust levels exceed the proposed action level of 2.5 milligrams per cubic meter (mg/m³). Access roads

and works areas will be routinely sprayed with water to help mitigate dust levels during dry conditions, and action will be taken to address sustained exceedances of the proposed action level and reduce dust levels within acceptable limits. In addition to off-site water sources, WTS effluent meeting substantive requirement criteria may be used for dust control with EPA approval.

Further details regarding perimeter air quality standards and monitoring procedures are provided in the Field Monitoring Plan and its Appendix (GEI, 2022b).

5.2.2 Turbidity Monitoring

In accordance with the SESC Plan for the Area 3 TCRA and using it as a model, real-time turbidity monitoring will be conducted to monitor potential changes to the in-stream conditions caused by dredging and installation of turbidity controls. Three turbidity monitoring stations will be installed, as will be defined in the Field Monitoring Plan (GEI, 2022b). The turbidity monitors will collect data 24 hours per day, 7 days per week, except during icing conditions, severe storms, and flood events that may result in damage or loss of monitoring equipment. During extended periods where no intrusive work is being performed, turbidity monitoring may still be conducted to monitor and evaluate the success of restoration and erosion control measures. Action levels will be established as an allowable increase in downstream turbidity readings above upstream turbidity. This general approach will be the basis for the Part 1 TCRA but may be adapted for differing river conditions and finalized as part of a Field Monitoring Plan revision or the forthcoming SESC Plan.

5.3 Stormwater Controls

Stormwater controls and BMPs will be established to the extent practical to convey upland runoff away from active removal activities. Stormwater controls and BMPs will be monitored and maintained throughout the duration of the project to verify they are functioning as intended. Details regarding erosion control and stormwater conveyance will be provided in the SESC Plan.

5.4 Water Control Structure

A WCS will be installed to lower the water surface elevation during future Area 4 TCRA activities following completion of the Part 1 TCRA. As part of the design process, the hydraulics and risks of various flood scenarios have been evaluated for the dam removal steps. GEI submitted plans and specifications detailing the installation and phasing of the WCS on September 1, 2022 in the “Supplemental Design Submission.”

The WCS consists primarily of H-pile framing and steel sheet pile (SSP) walls to control water through the dam site and facilitate future demolition of the remaining dam. The WCS will be tied into the existing SSP system installed in 2019. Geotechnical information from the 2019 stabilization work combined with additional geotechnical information collected by GEI supported the design. The WCS is designed to passively allow river flows to pass during the future staged drawdown and dam removal activities. The normal and flood hydraulics at the dam have been evaluated to support the WCS geometry and downstream erosion control measures and are presented in the Dam Removal and River Stabilization Report previously submitted to EPA. The design of the WCS will accommodate lowering the water elevation to support future bank remediation.

5.5 Sediment Removal

5.5.1 Dredging

For Subarea E and applicable portions of Subarea G, hydraulic and mechanical dredging methods will be used. Dredge material will be segregated and disposed off-site as Subtitle D material (PCB concentrations of >1 to <50 mg/kg) or as Subtitle C material (PCB concentrations \geq 50 mg/kg) dependent on pre-design waste characterization sampling. Prior to transport off-site, hydraulically dredged sediment will be dewatered using Geo-tubes™ and mechanically dredged material will be processed by physical dewatering methods such as mixing, aeration, and decanting. The dewatering process for both methods will occur at the dredge staging area. Water drained from dredged sediments will be collected and conveyed to the active on-site WTS.

Dredge prisms were developed based on the output of geostatistical modeling of the vertical and horizontal extent of PCBs in sediment. Details of the geostatistical modeling are presented in the PDI Data Summary Report (GEI, 2022e). The dredge prisms were designed to encompass the full extent of PCBs estimated by the geostatistical model to exceed the cleanup standard. Appendix B shows representative cross-sections as corrected after PDI Phase 3 cores were taken into account.

Two separate dredge prisms were prepared to allow the initial removal of the material \geq 50 mg/kg PCB for segregation and special handling. The dredge prisms for areas with widespread areas \geq 50 mg/kg PCB were defined from a geostatistical model of the upper and lower vertical extents of sediment with \geq 50 mg/kg. These areas were fitted to dredge prisms applying a 6-inch buffer above and below the \geq 50 mg/kg material. The total sediment volume of these areas is estimated at 14,000 cubic yards.

The PDI also identified several small discontinuous areas with ≥ 50 mg/kg in at least one interval. These locations were evaluated as follows: the concentration for those intervals with ≥ 50 mg/kg plus the concentration reported in the 6 inches immediately below and above were depth-weighted and averaged. If the resulting average was < 50 mg/kg, the location will not be considered for segregated removal for special handling. If the resulting average was ≥ 50 mg/kg, the location will be excavated with appropriate over-dredge and segregated with other ≥ 50 mg/kg material.

The second dredge prism was fitted to the geostatistical model developed from the PDI data indicating vertical and horizontal extent of material ≥ 1.0 mg/kg PCB. This phase of dredging will occur following the removal of the material ≥ 50 mg/kg. Dredging will not extend past the alluvial base when encountered. The total volume is estimated at 320,000 cubic yards (Fig. 5).

Global Positioning System-directed software (HYPACK or equivalent) will guide dredge equipment. Following completion of dredging, confirmation sampling will be conducted in accordance with the Confirmation Sampling FSP (GEI, 2023b).

Following dredge activities, periodic bathymetric surveys will be performed to verify that the design dredge elevations have been achieved.

5.5.2 Confirmation Sampling

Following dredging, sediment samples will be collected and evaluated to confirm that cleanup criteria to PCB concentrations of ≤ 1.0 mg/kg have been met. Confirmation sampling will be performed as a defined in-stream confirmation cell grid in accordance with the Confirmation Sampling FSP (GEI, 2023b), which is pending EPA approval. Composite samples will be collected from multiple intervals to define re-dredging needs in case of exceedances. Confirmation sampling will occur as soon as practical after dredging is completed in a given area. Additional details regarding sediment confirmation sampling are provided in the Confirmation Sampling FSP (GEI, 2023b).

Split confirmation samples will be coordinated with both START and EGLE.

5.6 Riverbank Temporary Erosion Control

Identified unstable banks with PCB impacts ≥ 5.0 mg/kg and select near-bank stream tubes will be temporarily contained using turbidity screens to prevent migration of PCB-impacted bank material into the main channel following dredging. The proposed screens will use conventional containment techniques successfully implemented throughout the Kalamazoo River, including a geotextile filter designed to contain sediment anchored to fixed features such as trees, posts, or other

sufficient structures. The locations of the installed containment are based on the documented bank removal areas and field determination of susceptible erosive conditions (Fig. 6). The actual screen locations will be adjusted based on observed field conditions. The containment will remain in place following completion of Part 1 TCRA until future work removes PCB-impacted bank material and permanently stabilizes the banks.

Additionally, sheet piling will be installed along portions of Subareas F and G to prevent movement of PCB-impacted material into the main channel following dredging. As previously stated, these areas will be addressed during future floodplain work under a future Record of Decision following water level lowering and Trowbridge Dam removal. However, sheet piling will be installed with weir structures to allow for movement of water between Subareas F and G and the main channel while Trowbridge Dam is still in place and Subareas F and G remain inundated.

Monitoring and maintenance of temporary turbidity screens will be performed monthly or after each storm event. Monitoring will consist of a visual inspection of the bank to document stability and state of erosion. If the bank demonstrates signs of erosion, the inspection team will verify if the sediment is captured between the bank and screen. If eroded material is observed to be beyond the turbidity screen, the material will be removed and staged in the Trowbridge staging area for transport and disposal. The turbidity screen will be adjusted or repaired as necessary. Inspections from the water are anticipated but will be dependent on weather. Alternative access methods may be employed. This turbidity screen monitoring and maintenance will continue until Part 2 of the work is completed as discussed in Section 5.10.

5.7 Invasive Species Control

An integral component of floodplain restoration (associated with Subarea G1 remediation) will include the installation and incorporation of native woody and herbaceous vegetation. To promote the successful establishment of native vegetation, invasive plant species control will be conducted as required. Applicable permit requirements will be met during invasive species control activities. More details are contained within the Invasive Plant Management Plan (GEI, 2021a).

As per section 5.1.7, field work will also be conducted in general accordance with the State of Michigan policy for invasive species decontamination procedures (EGLE, 2014), which aim to minimize the introduction or spread of invasive species to and from the site.

5.8 Waste Management and Disposal

Removed material will be disposed in an appropriate landfill based on PDI testing results and applicable landfill acceptance criteria. Prior to transport to the landfill, material will be staged within Geo-tubes™ and/or lined stabilization/load-out pads for dewatering, conditioning, and solidification. Following sediment solidification, the sediment will be transported to the approved landfill for disposal. Manifests and weight tickets will be managed throughout the project to track off-site disposal quantities. A detailed discussion of waste management and disposal will be provided in the Waste Management Plan.

5.9 Site Cleanup and Demobilization

After completion of Part 1 TCRA, equipment and resources will be demobilized. However, provided the timing (approved scope of Part 2) of future work is amenable, staging areas, roads, and temporary erosion controls will be left in place for use during future TCRA work. Staging areas and roads may be repaired if necessary to prepare these areas for future TCRA work.

5.10 Post-Removal Monitoring and Maintenance

After Part 1 TCRA completion, post-removal maintenance and monitoring of physical site infrastructure (access roads, dredge pad staging area, sheet pile, riverbank temporary containment, temporary upland erosion controls) will continue for a period as determined in consultation with EPA.

Additionally, temporary riverbank containments will remain in place following Part 1 TCRA until future work removes PCB-impacted bank material and stabilizes the banks. Following initial placement, periodic monitoring will verify turbidity screens are functioning as intended. Maintenance will be performed as necessary.

The Post-Removal Site Control Plan and the Long-Term Monitoring Plan will include maintenance and monitoring details for after the final TCRA is complete. This plan will be submitted at a later date. Inspection documentation and tracking practices will be further discussed in that plan. After completion of the Area 4 TCRA maintenance and monitoring phase, a final report will be compiled and submitted to the EPA. Any remediation, monitoring, and maintenance necessary beyond the Area 4 TCRA will be addressed in the Area 4 ROD once issued.

6. Permitting

In accordance with the CD, acquisition of the permits discussed within this section are not required for performance within the boundaries of the Area 4 TCRA. However, to the extent practicable within the scope of work defined in the CD, meeting the substantive State and local requirements will be demonstrated in consultation with EPA.

6.1 Michigan Department of Environment, Great Lakes, and Energy

6.1.1 *National Pollutant Discharge Elimination System*

The National Pollutant Discharge Elimination System (NPDES) permit was initiated by the Federal Water Pollution Control Act amendments of 1972 with the purpose of controlling the discharge of pollutants into surface water by imposing effluent limitations for environmental protection. Currently, authority for NPDES permit issuance rests with EGLE. Meeting the substantive requirements of a NPDES permit will be demonstrated for discharge of treated waters to surface waters of the state.

The NPDES substantive requirements document will be submitted to EPA and will include the following:

1. General information regarding the location of the discharge.
2. A description of the wastewater and “facility.”
3. Water flow diagram and narrative description.
4. Location map.
5. List of adjacent property owners.
6. Appropriate signatures.
7. Antidegradation exemption (required for new discharges).

6.1.2 *Aquatic Nuisance Control*

To meet the substantive requirements for individual permit or certificate of coverage prior to the initiation of any chemical treatment of invasive species within waters of the state or where the area of impact contains visible water at the time of chemical

treatment, Aquatic Nuisance Control efforts will be performed in accordance with Part 33, Aquatic Nuisance Control (ANC), of the Natural Resources and Environmental Protection Act (NREPA), 1994, PA 451, as amended.

6.2 Michigan Department of Transportation

The Michigan Department of Transportation (MDOT) Development Services Division has the regulatory authority for managing the use of the state highway right-of-way (ROW) and adjacent boundaries. It regulates private and public entity's use of the state highway ROW by acting as the primary liaison between MDOT and other state government agencies, the Federal Highway Administration, utility companies, and permit applicants. MDOT uses the Construction Permit System for requesting and issuing construction permits. Business or private parties and utility companies wishing to use the highway ROW for operations other than normal vehicular or pedestrian travel are required to obtain an MDOT permit.

The Grand Rapids Transportation Service Center may be contacted prior to permit application submittal to facilitate permit approval and obtain guidance on the appropriate permit type. The permit application will include, as applicable:

1. Applicant information.
2. Site information, including location of work.
3. Work information, including start/end dates, activity purpose and description, lane closure proposal.
4. Insurance information.
5. Bond information.
6. Mitigation methods.
7. Transportation operation plans.
8. Permit fee determination data.

6.3 Allegan County Road Commission

Allegan County Road Commission (ACRC) requirements will be considered before using any portion of county road ROW to construct, operate, maintain, or remove a facility. Information included in the permit application will be compliant with the most recent guidelines from the ACRC and will include:

1. Plans, specifications, and map depicting the scope of work.
2. Proof of insurance.

A permit is considered issued once a permit number is assigned and the ACRC signs the application.

The ACRC will be notified at least 48 hours before starting work and will be notified when work is completed. Work shall be performed Mondays through Fridays between 8:00 AM and 5:00 PM, unless written approval is obtained from the ACRC. Other seasonal load restrictions may apply and will be accounted for to prevent interruptions to TCRA construction.

6.4 Allegan County Health Department

In accordance with Part 91, Soil Erosion and Sedimentation Control, of NREPA, 1994, PA 451, as amended, Allegan County requires an SESC permit for sites with earth change greater than one acre or within 500 feet of a body of water. Submission of SESC substantive requirement applications will be coordinated with EPA and the Allegan County Health Department.

6.5 U.S. Fish and Wildlife Service

Area 4 TCRA work will comply with the substantive requirements of both the Endangered Species Act of 1973, Public Law 93-205, 87 Stat. 884 and Part 365, Endangered Species Protection, of NREPA, 1994, PA 451, as amended. EPA is currently working with USFWS to obtain an Endangered Species Act consultation. Results and recommendations from this consultation will be considered in project design and implementation.

A review of federal and state-listed endangered and threatened species with the potential to occur in Allegan County was conducted. The USFWS IPaC resource list (USFWS, 2020) as well as the Michigan Natural Features Inventory (MNFI) (MNFI, 2020) were reviewed for the project area. The species are compiled in Table 1, along with their federal and state protection statuses, and a preliminary determination of potential for occurrence in the project area. The potential for occurrence determinations were based on GEI's site knowledge and preliminary assessment of habitat present in the TCRA 4 work area. The MNFI has documented five federally protected species in Allegan County (Table 1). Of these, the federally endangered Indiana bat (*Myotis sodalis*) and federally threatened northern long-eared bat (*Myotis septentrionalis*), and eastern massasauga rattlesnake (*Sistrurus catenatus*) may occur in the project vicinity.

6.5.1 Mussel Salvage and Relocation

As part of Area 4 TCRA, freshwater mussel survey and salvage efforts have been conducted in Subarea E, F, and G ahead of the impacted sediment removal actions. An initial reconnaissance effort focusing on substrate characterization was conducted prior to mussel salvage efforts. An additional mussel survey downstream of the Trowbridge Dam was conducted in 2023. Mussel species diversity and density in Area 4 was generally consistent with previous mussel relocation efforts conducted in Area 3 (OU5) of the Kalamazoo River.

More details can be found in the Mussel Work Plans and Mussel Salvage Report (GEI 2020b, 2021b, 2022a, 2023d), which detail mussel reconnaissance, salvage, and relocation efforts associated with the TCRA. The Mussel Work Plan will be revised or supplemented, as applicable, to cover salvage activities associated with the ultimate removal of Trowbridge Dam. This work plan was developed with input from MDNR and USFWS prior to implementation.

6.6 Joint Permit Application

Substantive requirements for a Joint Permit will be considered for TCRA activities to be performed consistent with Inland Lakes and Streams (Part 301), Wetlands (Part 303), Floodplains (Part 31), and Dams (Part 315) of NREPA, 1994, PA 451, as amended.

6.7 Applicable or Relevant and Appropriate Requirements

Applicable or Relevant and Appropriate Requirements (ARARs) and to be considered (TBCs) were previously identified on a site-wide basis and approved by EPA on December 23, 2008. Although TBCs may be practically applicable or relevant and appropriate to the site, non-promulgated advisories or guidance documents issued by federal or state governments lack the legal status of ARARs.

Tables 2 through 4 show ARARs taken from Amec's 2018 SRI (Amec Foster Wheeler, 2018) and EGLE's submission dated May 5, 2020 (EGLE, 2020).

6.8 Allegan County Drain Commissioner

The Allegan County Drain Commissioner will be consulted to review the TCRA scope and the potential for impact to any designated county drains. Meeting the substantive requirements of a Drain Use Permit will be demonstrated in consultation with EPA prior to activities undertaken within a county drain including, but not limited to, crossings, connections, cleanouts, enclosures, and relocations.

6.9 Other Permits/Requirements

Cultural resources may be addressed before initiating TCRA activities. A review of the Michigan Historic Preservation Office National Register of Historic Places and a review of the Michigan Office of the State Archaeologist have been conducted by START. This review determines if known historical, archaeological, or cultural resources are located on or near the project area. If previously unidentified or unanticipated resources are discovered during excavation or other construction activity, activities that may damage or alter such resources will be temporarily suspended until protection measures may be employed. In addition, field personnel will be prevented from trespassing on, removing, or otherwise damaging such resources. An appropriate designated government representative will be notified on discovery of these resources. Further details have been provided by EPA in the Discovery Plan (EPA, 2022).

The EPA Superfund Division inserted the following language in the Tribal Environmental Agreements negotiated in 2015 with the Match-E-Be-Nash-She-Wish Band Pottawatomis Indians (MBPI) and the Nottawaseppi Huron Band of Potawatomi (NHBP), “The Superfund Division will continue to address contamination associated with the Allied Paper/Kalamazoo River [National Priorities List] Site in accordance with the requirements of CERCLA and the National Contingency Plan. EPA will coordinate and consult with the Tribe on USEPA actions.” The MBPI are anticipated to “participate in information meetings on the Allied Paper/Kalamazoo River NPL Site.” The NHPI are anticipated to “participate as a stakeholder at meetings for NPL site.” EPA has developed a project-specific Discovery Plan to be implemented should tribal artifacts be revealed during project field activities (EPA, 2022).

7. Project Access

7.1 Michigan Department of Natural Resources

MDNR manages approximately 4.6 million acres of Michigan's land surface, which is open to the public for a variety of uses. MDNR allows for limited commercial operations on state lands if they are compatible with the management and purpose of the lands, are consistent with the MDNR's mission and policies, and do not conflict with other users of the land. Commercial use is defined as use of a state-managed property or land for profit or benefit. Outside of Superfund, the MDNR requires prior written permission to conduct these activities and has the authority to collect application, land use, and monitoring fees for these types of activities.

Access to several MDNR-managed properties will be required for pre-design sampling, construction of staging areas and access roads, sediment removal, temporary bank stabilization, and associated activities. Land Use Permit applications for permission to use public land may be prepared, as documentation of compliance with the substantive requirements of Michigan law, and submitted to EPA for approval. MDNR is aware of the Area 4 TCRA activities that will be occurring on state land, and regular coordination with agency staff will occur so that agreements to use the land can be obtained efficiently.

Compliance with Michigan statutes, including practicable substantive requirements that ordinarily would appear in MDNR land use permits, will be considered before TCRA activities begin.

7.2 Private Property

Privately owned parcels will require access to complete pre-design sampling as well as bank excavation and restoration to take place as part of Part 2. Additionally, select privately owned parcels that are not included in the removal activities may be used to provide access to MDNR property.

EPA will take the lead in requesting and obtaining access agreements using an agreed-upon format. To assist in this process, EPA and MDNR may request from GEI a drawing, map, or other documentation that identifies where access will be requested. The agencies request 4 weeks' advance notice so they have sufficient time to notify property owners. Notification by the agencies often encompasses written notification, providing an actual access agreement, and often involves in-person visits by agency personnel with property owners as needed.

8. Planning Documents

Below is a list of the planning documents that have been or will be prepared to support the execution of TCRA activities. The Health and Safety Plan (HASP), QAPP, Quality Management Plan (QMP), Data Management Plan (DMP), Site Security Plan, Emergency Response Plan, PDI FSP, Field Monitoring Plan, and Invasive Plant Management Plan have been provided previously under separate cover. The remaining documents will be prepared and submitted in draft form prior to construction activities to the EPA as they are completed. Additional plans or planning documents that will be necessary to the implementation of the Area 4 TCRA will be added as appropriate. As work progresses, planning documents may be modified and updated as appropriate.

8.1 Health and Safety Plan

The HASP describes measures that will be taken to minimize risk to site workers and the public during execution of the TCRA work from potential chemical and physical hazards at the site (GEI, 2023c). It also fulfills requirements of the Occupational Safety and Health Administration (OSHA) and GEI's corporate health and safety program. The HASP has been submitted to the EPA and accepted by the EPA for the Kalamazoo Superfund Site OU5, which is inclusive of the Area 4 TCRA boundary.

8.2 Quality Assurance Project Plan

The QAPP provides a framework for how environmental data has and will be collected to achieve the project objectives (GEI, 2022d). It describes the procedures to be used to obtain quality and adequate data. The QAPP includes aspects of project management, measurement, data management and acquisition, oversight and assessment, and data validation. The QAPP and its revisions have been approved by the EPA for the Kalamazoo River Superfund Site OU5, which is inclusive of the Area 4 TCRA boundary.

8.3 Data Management Plan

The DMP describes the lifecycle of the Area 4 TCRA environmental data, from data collection to storage and archiving (GEI, 2020a). Components of the DMP include a description of the types of data and their sources, data tracking, data validation, and data verification and integrity. The DMP also includes procedures for data sharing with START for data collected by both GEI and START.

8.4 Quality Management Plan

The QMP describes how quality will be managed throughout the project (GEI, 2022f). It includes the GEI corporate processes and procedures for ensuring quality planning, assurance, and control within projects performed under the oversight of EPA Region 5.

8.5 Field Sampling Plan

The Field Sampling Plan consists of the Pre-Design Investigation FSP and the Confirmation Sampling FSP and addenda that may be added as necessary.

The PDI FSP and its addenda include sampling and data acquisition plans to support Area 4 TCRA design (GEI, 2020c). They describe the sampling objectives and rationale, as well as tasks that will be undertaken, including sediment and soil sampling, surveying, and sediment probing.

The Confirmation Sampling FSP is inclusive of sampling and data acquisition to support confirmation of Area 4 TCRA sediment and bank removal volumes (GEI, 2023b). It will describe the sampling objectives and rationale, and tasks that will be undertaken including sediment and soil sampling and surveying.

8.6 Waste Management Plan

This plan will include a detailed description of appropriate handling, storage, transportation, and disposal practices of soil and sediment based on characterization results obtained during the PDI. It will also discuss management of anticipated waste streams generated during TCRA construction including vegetative debris and construction waste and debris. Additional topics covered in this plan will include water treatment, waste documentation, and spill response and reporting.

8.7 Site Security Plan

This plan describes security measures that will be taken to notify and protect the general population from construction-zone hazards as well as protect the construction zone from trespassers and vandalism (GEI, 2020d).

8.8 Traffic Control Plan

This plan will establish truck routes and general traffic pattern guidelines for the work areas, staging, support, and local areas around the Area 4 TCRA boundary. It will include a decontamination plan for removing impacted soil and sediment from vehicles and equipment as well as a disinfection process. The decontamination

procedure will be developed consistent with MDNR guidance that provides for thorough cleansing of trucks, boats, and equipment that could potentially transport unwanted invasive species onto the Site.

8.9 Soil Erosion and Sedimentation Control Plan

This plan will include descriptions of best management practices to be implemented during Area 4 TCRA work to mitigate and control stormwater runoff, soil erosion, water turbidity related to removal activities, and monitoring BMPs. This plan will include specifics of monitoring stormwater runoff, dust generated during construction, and turbidity in river water.

8.10 Emergency Response Plan

This plan describes incident response to potential severe weather conditions, catastrophic occurrences (such as failure of the Trowbridge Dam or Pine Creek WCS), or local emergencies (GEI, 2021c).

8.11 Invasive Plant Management Plan

This plan describes measures that will be taken to control and manage invasive plant species in and near the Area 4 TCRA work areas (GEI, 2021a). Preconstruction vegetative community surveys have been conducted to qualitatively document and characterize existing vegetative community conditions, including species composition and relative dominance.

8.12 Post-Removal Site Control Plan

This plan will describe the measures that will be undertaken to ensure the establishment of erosion controls, vegetation maintenance and replacement (where necessary), and maintenance of engineering controls.

8.13 Construction Quality Assurance/Quality Control Plan

A Construction Quality Assurance/Quality Control Plan (CQCP) will be provided by the contractor for documentation of the contractor's process for delivering the level of construction quality required by the contract. This document is intended to provide guidance to Federal Lands contractors, subcontractors, and suppliers. The CQCP is a framework for the contractor's process for delivering quality construction. The plans and specifications define the expected results or outcome. The CQCP outlines how those results will be achieved.

8.14 Stormwater Pollution Prevention Plan

Water quality requirements will be established for surface waters in the State of Michigan. Part 4 rules specify standards for all waters of the State and require that all designated uses of the receiving water be protected, including aquatic life and wildlife. The approved water quality standards for protection of wildlife and human health are 1.2×10^4 micrograms per liter ($\mu\text{g/L}$) and 2.6×10^{-5} $\mu\text{g/L}$ PCBs, respectively. Prior substantive requirements at OU5 have specified PCB discharge limitations of 2.6×10^{-5} $\mu\text{g/L}$. Potential chemical-specific ARARs are shown in Table 2.

8.15 Field Monitoring Plan

The Field Monitoring Plan includes descriptions of BMPs to be implemented at the site to monitor dust, turbidity, and water levels (GEI, 2022b). It integrates START's perimeter air monitoring plan. Response actions are also outlined. Potential action-specific ARARs are shown in Table 4.

9. Community Relations

EPA will lead public engagement efforts for the Area 4 TCRA work. GEI, as directed by the regulatory parties, will follow the agencies' lead in public involvement and provide support through presentation materials such as visual displays, photographs, diagrams, fact sheets, and other materials or presentations.

10. References

AECOM (2019a). "Trowbridge Dam Removal – Phase 1A, Basis of Design Report." Prepared for Michigan Dept. of Natural Resources. May 30, 2019.

AECOM (2019b). "Trowbridge Dam Removal Phase 1A, Final Bid Drawing Set for Bidding Purposes." Prepared for Michigan Dept. of Natural Resources. June 3, 2019.

Allegan County Road Commission (2012). Permits Manual Including Administrative Rules, Permit Forms, and Fee Schedule Regulating All Work or Activity. December 2012.

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Tables

Table 1. Federal and State Protected Species of Allegan County, Michigan and Their Potential for Occurrence within the Area 4 TCRA Project Boundaries

Table 2. Federal and State Chemical-Specific Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered (TBCs)

Table 3. Federal and State Location-Specific Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered (TBCs)

Table 4. Federal and State Action-Specific Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered (TBCs)

**Table 1. Federal and State Protected Species of Allegan County, Michigan and Their Potential for Occurrence within the Area 4 TCRA Project Boundaries
Area 4 Removal Work Plan
Area 4 TCRA, OU5 Allied Paper Inc./Portage Creek/Kalamazoo River Superfund Site**

Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank	Potential Occurrence in Impact Area?
<i>Acipenser fulvescens</i>	Lake sturgeon		T	G3G4	S2	No
<i>Acris blanchardi</i>	Blanchard's cricket frog		T	G5	S2S3	Yes
<i>Adlumia fungosa</i>	Climbing fumitory		SC	G4	S3	No
<i>Alasmidonta marginata</i>	Elktoe		SC	G4	S3?	Yes
<i>Alasmidonta viridis</i>	Slippershell		T	G4G5	S2S3	Yes
<i>Ambystoma opacum</i>	Marbled salamander		E	G5	S1	Yes
<i>Ammodramus henslowii</i>	Henslow's sparrow		E	G4	S3	Yes
<i>Ammodramus savannarum</i>	Grasshopper sparrow		SC	G5	S4	Yes
<i>Aristida longespica</i>	Three-awned grass		T	G5	S2	No
<i>Asclepias purpurascens</i>	Purple milkweed		T	G5?	S2	Yes
<i>Baptisia lactea</i>	White or prairie false indigo		SC	G4Q	S3	Yes
<i>Bartonia paniculata</i>	Panicled screwstem		T	G5	S2	No
<i>Berula erecta</i>	Cut-leaved water parsnip		T	G4G5	S2	Yes
<i>Boechera missouriensis</i>	Missouri rock-cress		SC	G5	S2	No
<i>Bombus affinis</i>	Rusty-patched bumble bee	LE	SC	G2	SNR	No
<i>Bombus auricomus</i>	Black and gold bumble bee		SC	G4G5	SNR	No
<i>Bombus pensylvanicus</i>	American bumble bee		SC	G3G4	SNR	No
<i>Brickellia eupatorioides</i>	False boneset		SC	G5	S2	No
<i>Buteo lineatus</i>	Red-shouldered hawk		T	G5	S4	Yes
<i>Calophrys irus</i>	Frosted elfin		T	G3	S2S3	No
<i>Carex albolutescens</i>	Sedge		T	G5	S2	No
<i>Carex festucacea</i>	Fescue sedge		SC	G5	S1	No
<i>Carex seorsa</i>	Sedge		T	G5	S2	Yes
<i>Chlidonias niger</i>	Black tern		SC	G4G5	S2	Yes
<i>Cincinnatia cincinnatiensis</i>	Campeloma spire snail		SC	G5	S3	No
<i>Cirsium pitcheri</i>	Pitcher's thistle	LT	T	G2G3	S3	No
<i>Cistothorus palustris</i>	Marsh wren		SC	G5	S3	Yes
<i>Clemmys guttata</i>	Spotted turtle		T	G5	S2	Yes
<i>Clonophis kirtlandii</i>	Kirtland's snake		E	G2	S1	Yes
<i>Collinsia verna</i>	Blue-eyed Mary		SC	G5	SNR	Yes
<i>Conioselinum chinense</i>	Hemlock-parsley		SC	G5	SNR	Yes
<i>Coregonus artedi</i>	Lake herring or Cisco		T	G5	S3	No
<i>Coregonus kiyi</i>	Kiyi		SC	G3G4	S2S3	No
<i>Coregonus zenithicus</i>	Shortjaw cisco		T	G3	S2	No
<i>Cottus ricei</i>	Spoonhead sculpin		SC	G5	S1S2	No
<i>Cryptotis parva</i>	Least shrew		T	G5	S1S2	Yes
<i>Cyclonaias tuberculata</i>	Purple wartyback		T	G5	S2	Yes
<i>Cypripedium candidum</i>	White lady slipper		T	G4	S2	Yes
<i>Diarrhena obovata</i>	Beak grass		T	G4G5	S2	Yes
<i>Dryobius sexnotatus</i>	Six-banded longhorn beetle		T	GNR	S1	Yes
<i>Echinodorus tenellus</i>	Dwarf burhead		E	G5?	S1	No
<i>Eleocharis atropurpurea</i>	Purple spike rush		E	G4G5	S1	No
<i>Eleocharis engelmannii</i>	Engelmann's spike rush		SC	G4G5	S2S3	No
<i>Eleocharis melanocarpa</i>	Black-fruited spike-rush		SC	G4	S3	No
<i>Eleocharis microcarpa</i>	Small-fruited spike-rush		E	G5	S1	No
<i>Eleocharis tricostata</i>	Three-ribbed spike rush		T	G4	S2	No
<i>Emydoidea blandingii</i>	Blanding's turtle		SC	G4	S2S3	Yes
<i>Enimyzon claviformis</i>	Creek chubsucker		E	G5	S1	Yes
<i>Erynnis persius persius</i>	Persius dusky wing		T	G5T1T3	S3	Yes
<i>Euonymus atropurpureus</i>	Wahoo		SC	G5	S3	Yes
<i>Euphorbia commutata</i>	Tinted spurge		T	G5	S1	Yes
<i>Eutrochium fistulosum</i>	Hollow-stemmed Joe-pye weed		T	G5?	S1	Yes
<i>Fontigens nickliniana</i>	Watercress snail		SC	G5	S2S3	Yes
<i>Fraxinus profunda</i>	Pumpkin ash		T	G4	S2	Yes
<i>Fuirena pumila</i>	Umbrella-grass		T	G4	S2	No
<i>Galearis spectabilis</i>	Showy orchis		T	G5	S2	Yes
<i>Gallinula galeata</i>	Common gallinule		T	G5	S3	Yes
<i>Gavia immer</i>	Common loon		T	G5	S3	No
<i>Gentiana puberulenta</i>	Downy gentian		E	G4G5	S1	No
<i>Geum triflorum</i>	Prairie smoke		T	G5	S2S3	No
<i>Glyptemys insculpta</i>	Wood turtle		SC	G3	S2	Yes
<i>Haliaeetus leucocephalus</i>	Bald eagle		SC	G5	S4	Yes
<i>Helianthus hirsutus</i>	Whiskered sunflower		SC	G5	S3	Yes

**Table 1. Federal and State Protected Species of Allegan County, Michigan and Their Potential for Occurrence within the Area 4 TCRA Project Boundaries
Area 4 Removal Work Plan
Area 4 TCRA, OU5 Allied Paper Inc./Portage Creek/Kalamazoo River Superfund Site**

Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank	Potential Occurrence in Impact Area?
<i>Hesperia ottoe</i>	Ottoe skipper		T	G3G4	S1	Yes
<i>Hieracium paniculatum</i>	Panicled hawkweed		T	G5	S2	Yes
<i>Hiodon tergisus</i>	Mooneye		T	G5	S1	No
<i>Hydrastis canadensis</i>	Goldenseal		T	G3G4	S2	Yes
<i>Hypericum gentianoides</i>	Gentian-leaved St. John's-wort		SC	G5	S3	No
<i>Isoetes engelmannii</i>	Engelmann's quillwort		E	G4	S1	No
<i>Juncus antheratus</i>	Large path rush		SC	G5TNR	SNR	No
<i>Juncus brachycarpus</i>	Short-fruited rush		T	G4G5	S1S2	No
<i>Juncus dichotomus</i>	Forked rush		SC	G5	SNR	No
<i>Juncus scirpoides</i>	Scirpus-like rush		T	G5	S2	No
<i>Juncus vaseyi</i>	Vasey's rush		T	G5	S1S2	No
<i>Lanius ludovicianus migrans</i>	Migrant loggerhead shrike		E	G4T3Q	S1	Yes
<i>Lasmigona compressa</i>	Creek heelsplitter		SC	G5	S3	Yes
<i>Lasmigona costata</i>	Flutedshell		SC	G5	SNR	Yes
<i>Lechea minor</i>	Least pinweed		X	G5	S1	No
<i>Lechea pulchella</i>	Leggett's pinweed		T	G5	S1S2	No
<i>Ligumia recta</i>	Black sandshell		E	G4G5	S1?	Yes
<i>Linum sulcatum</i>	Furrowed flax		SC	G5	S2S3	No
<i>Linum virginianum</i>	Virginia flax		T	G4G5	S2	Yes
<i>Lipocarpha micrantha</i>	Dwarf-bulrush		SC	G5	S3	No
<i>Lithobates palustris</i>	Pickereel frog		SC	G5	S3S4	Yes
<i>Ludwigia sphaerocarpa</i>	Globe-fruited seedbox		T	G5	S1	No
<i>Lycaeides melissa samuelis</i>	Karner blue	LE	T	G2	S2	No
<i>Lycopodiella subappressa</i>	Northern appressed clubmoss		SC	G2	S2	No
<i>Melanerpes erythrocephalus</i>	Red-headed woodpecker		SC	G5	S3	No
<i>Mesomphix cupreus</i>	Copper button		SC	G5	S1	No
<i>Microtus pinetorum</i>	Woodland vole		SC	G5	S3S4	No
<i>Myotis septentrionalis</i>	Northern long-eared bat	LT	SC	G1G2	S1	Yes
<i>Myotis sodalis</i>	Indiana bat	LE	E	G2	S1	Yes
<i>Necturus maculosus</i>	Mudpuppy		SC	G5	S3S4	No
<i>Notropis dorsalis</i>	Bigmouth shiner		SC	G5	S2	No
<i>Notropis texanus</i>	Weed shiner		X	G5	S1	No
<i>Nycticorax nycticorax</i>	Black-crowned night-heron		SC	G5	S3	Yes
<i>Obliquaria reflexa</i>	Threehorn wartyback		E	G5	S1	Yes
<i>Oecanthus laricis</i>	Tamarack tree cricket		SC	G3?	S3	No
<i>Panax quinquefolius</i>	Ginseng		T	G3G4	S2S3	Yes
<i>Pandion haliaetus</i>	Osprey		SC	G5	S4	Yes
<i>Panicum longifolium</i>	Panic grass		T	G4	S2	No
<i>Panicum verrucosum</i>	Warty panic grass		T	G4	S1	No
<i>Pantherophis spiloides</i>	Gray ratsnake		SC	G4G5	S2S3	Yes
<i>Papaipema beeriana</i>	Blazing star borer		SC	G2G3	S2	No
<i>Papaipema maritima</i>	Maritime sunflower borer		SC	G3	S2	Yes
<i>Papaipema sciata</i>	Culvers root borer		SC	G3	S3	No
<i>Papaipema speciosissima</i>	Regal fern borer		SC	G4	S2S3	Yes
<i>Parkesia motacilla</i>	Louisiana waterthrush		T	G5	S2	Yes
<i>Persicaria careyi</i>	Carey's smartweed		T	G4	S1S2	No
<i>Platanthera ciliaris</i>	Orange- or yellow-fringed orchid		E	G5	S1S2	No
<i>Pleurobema sintoxia</i>	Round pigtoe		SC	G4G5	S3	Yes
<i>Poa paludigena</i>	Bog bluegrass		T	G3G4	S2	Yes
<i>Polygala cruciata</i>	Cross-leaved milkwort		SC	G5	S3	No
<i>Potamilus alatus</i>	Pink heelsplitter		SC	G5	SNR	No
<i>Potamogeton bicupulatus</i>	Waterthread pondweed		T	G4	S2	No
<i>Protonotaria citrea</i>	Prothonotary warbler		SC	G5	S3	Yes
<i>Pycnanthemum verticillatum</i>	Whorled mountain mint		SC	G5	S2	No
<i>Pygarctia spraguei</i>	Sprague's pygarctia		SC	G5	S2S3	No
<i>Rallus elegans</i>	King rail		E	G4	S2	No
<i>Rhexia mariana</i>	Maryland meadow beauty		T	G5T5	S1S2	No
<i>Rhexia virginica</i>	Meadow beauty		SC	G5	S3	No
<i>Rhynchospora macrostachya</i>	Tall beakrush		SC	G4	S3S4	No
<i>Rhynchospora nitens</i>	Short-beak beak-rush		E	G4?	S1	No
<i>Rhynchospora recognita</i>	Globe beak-rush		E	G5?	S1	No
<i>Rhynchospora scirpoides</i>	Bald-rush		T	G4	S2	No
<i>Schoenoplectiella hallii</i>	Hall's bulrush		T	G2G3	S2	No
<i>Schoenoplectus torreyi</i>	Torrey's bulrush		SC	G5?	S2S3	No

**Table 1. Federal and State Protected Species of Allegan County, Michigan and Their Potential for Occurrence within the Area 4 TCRA Project Boundaries
Area 4 Removal Work Plan
Area 4 TCRA, OU5 Allied Paper Inc./Portage Creek/Kalamazoo River Superfund Site**

Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank	Potential Occurrence in Impact Area?
<i>Scleria pauciflora</i>	Few-flowered nut rush		E	G5	S1	No
<i>Scleria reticularis</i>	Netted nut rush		T	G4	S2	No
<i>Scleria triglomerata</i>	Tall nut rush		SC	G5	S3	No
<i>Setophaga cerulea</i>	Cerulean warbler		T	G4	S3	Yes
<i>Setophaga citrina</i>	Hooded warbler		SC	G5	S3	Yes
<i>Setophaga discolor</i>	Prairie warbler		E	G5	S3	Yes
<i>Setophaga dominica</i>	Yellow-throated warbler		T	G5	S3	Yes
<i>Sistrurus catenatus</i>	Eastern massasauga	LT	SC	G3	S3	Yes
<i>Sisyrinchium atlanticum</i>	Atlantic blue-eyed-grass		T	G5	S2	No
<i>Spiranthes ovalis</i>	Lesser ladies'-tresses		T	G5?	S1	No
<i>Spiza americana</i>	Dickcissel		SC	G5	S3	No
<i>Sporobolus clandestinus</i>	Dropseed		E	G5	S1	No
<i>Sporobolus heterolepis</i>	Prairie dropseed		SC	G5	S3	No
<i>Strophostyles helvula</i>	Trailing wild Bean		SC	G5	S3	No
<i>Symphotrichum sericeum</i>	Western silvery aster		T	G5	S2	No
<i>Terrapene carolina carolina</i>	Eastern box turtle		SC	G5T5	S2S3	Yes
<i>Tradescantia bracteata</i>	Long-bracted spiderwort		X	G5	SX	No
<i>Trichostema dichotomum</i>	Bastard pennyroyal		T	G5	S2	No
<i>Triphora trianthophora</i>	Nodding pogonia/three birds orchid		T	G4?	S1	No
<i>Truncilla donaciformis</i>	Fawnsfoot		T	G5	S1	Yes
<i>Truncilla truncata</i>	Deertoe		SC	G5	S2S3	Yes
<i>Utricularia subulata</i>	Bladderwort		T	G5	S1	No
<i>Utterbackia imbecillis</i>	Paper pondshell		SC	G5	S2S3	Yes
<i>Valerianella chenopodiifolia</i>	Goosefoot corn salad		T	G4	S1	Yes
<i>Venustaconcha ellipsiformis</i>	Ellipse		SC	G4	S3	Yes
<i>Villosa iris</i>	Rainbow		SC	G5	S3	Yes
<i>Wolffia brasiliensis</i>	Watermeal		T	G5	S1	Yes
<i>Zizania aquatica</i>	Wild rice		T	G5	S2S3	No

Notes:

MNFI County Element Data: <https://mnfi.anr.msu.edu/resources/county-element-data>, accessed 3/19/2020

Federal Status

LE - Listed endangered
 LT - Listed threatened
 LELE - Partly listed endangered and partly listed threatened
 PDL - Proposed delist
 E(S/A) - Endangered based on similarities/appearance
 PS - Partial status (federally listed in only part of its range)
 C - Species being considered for federal status

State Status

E - Endangered
 T - Threatened
 SC - Special Concern

Global Ranks

G1 - Critically imperiled globally because of extreme rarity or because of some factors making it especially vulnerable to extinction
 G2 - Imperiled globally because of rarity or because of some factors making it very vulnerable to extinction throughout its range
 G4 - Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery
 G5 - Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
 GH - Of historical occurrence throughout its range, i.e. formerly part of the established biota, with the expectation
 GU - Possibly in peril range-wide, but status uncertain; need more information.
 GX - Believed to be extinct throughout its range (e.g. Passenger Pigeon) with virtually no likelihood that it will be rediscovered.

State Ranks

S1 - Critically imperiled in the state because of extreme rarity (5 or fewer occurrences or very few remaining)
 S2 - Imperiled in state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of
 S3 - Rare or uncommon in state (on the order of 21 to 100 occurrences).
 S4 - Apparently secure in state, with many occurrences.

Table 1. Federal and State Protected Species of Allegan County, Michigan and Their Potential for Occurrence within the Area 4 TCRA Project Boundaries
Area 4 Removal Work Plan
Area 4 TCRA, OU5 Allied Paper Inc./Portage Creek/Kalamazoo River Superfund Site

Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank	Potential Occurrence in Impact Area?
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- S5 - Demonstrably secure in state and essentially ineradicable under present conditions.
- SA - Accidental in state, including species (usually birds or butterflies) recorded once or twice or only at very great intervals, hundreds or even thousands of miles outside their usual range.
- SE - An exotic established in the state; may be native elsewhere in North America (e.g. house finch or catalpa in eastern states).
- SH - Of historical occurrence in state and suspected to be still extant.
- SN - Regularly occurring, usually migratory and typically nonbreeding species.
- SR - Reported from state, but without persuasive documentation which would provide a basis for either accepting
- SRF - Reported falsely (in error) from state but this error persisting in the literature.
- SU - Possibly in peril in state, but status uncertain; need more information.
- SX - Apparently extirpated from state.

**Table 2. Federal and State Chemical-Specific Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered (TBCs)
Area 4 Removal Work Plan
Area 4 TCRA, OUS Area 4 TCRA Allied Paper Inc./Portage Creek/Kalamazoo River Superfund Site**

Action/Medium	Requirements	Prerequisite	Citation	Applicable to Sediment/Soil Alternatives	
				Sediment	Soil
Protection of surface water and sediment	Establishes effluent standard for toxic compounds. Applies to discharges to navigable waters. The ambient water quality criterion for navigable waters is 0.001 µg/L total PCB.	Discharges to waters of the State of Michigan - relevant and appropriate	40 CFR Part 129.105 Toxic Pollutant Effluent Standards	X	X
Protection of aquatic life and human health	Water quality criterion for protection of aquatic life for continuous concentration (chronic) is 0.014 µg/L PCBs in freshwater. Water quality criterion for protection of human health is 0.000064 µg/L PCBs in freshwater.	PCB concentrations in surface water - relevant and appropriate	63 Fed. Reg. 68354 (December 10, 1998) Clean Water Act	X	
Protection of surface water, sediment, and soil	Water quality criteria for 29 pollutants and detailed methodologies to develop criteria for additional pollutants; implementation procedures to develop more consistent, enforceable water quality-based effluent limits in discharge permits, as well as total maximum daily loads of pollutants that can be allowed to reach the Great Lakes and their tributaries from all sources; and antidegradation policies and procedures. The Great Lakes States must adopt water quality standards, antidegradation policies and implementation procedures for waters within the Great Lakes System. The PCB human health criterion is 3.9 x 10 ⁻⁶ µg/L for both drinking and non-drinking water, and the wildlife protection criterion is 7.5 x 10 ⁻⁶ µg/L. The 2,3,7,8-TCDD wildlife protection criterion is 3.1 x 10 ⁻⁶ µg/L.	Effluent discharges to the Great Lakes and/or their tributaries - relevant and appropriate	40 CFR Parts 9, 122, 123, 131, and 132 Final Water Quality Guidance for the Great Lakes System	X	X
Protection of potential drinking water sources	The Safe Drinking Water Act regulations establish maximum contaminant levels (MCL) and maximum contaminant level goals (MCLG) for public water supplies. The MCL for PCBs is 0.5 µg/L and the MCLG is 0.0 µg/L.	PCB concentrations in a potential drinking water source - relevant and appropriate	40 CFR 141 Safe Drinking Water Act		
Protection of surface water ¹	Water quality requirements for surface waters in the State. Part 4 rules specify standards for all waters of the State, and require that all designated uses of the receiving water be protected, including aquatic life and wildlife. Part 8 rules establish water quality-based effluent limits. The Part 22 rules set water quality rules applicable to discharges to groundwater. Applicable to response actions. Substantive requirements of permits to discharge apply. Standards are applicable to venting groundwater, storm water, and discharges associated with the response action. Regulates discharges to waters of the State or onto the ground or groundwater if uses are potentially injured.	Water quality requirements for the State - relevant and appropriate	Michigan NREPA, Part 31 (Water Resources Protection), MCL 324.3101-3133; Mich. Admin. Code R. 323.104-1117 (Part 4 rules); R 323.1201-1221 (Part 8 Rules); R 323.201-2240 (Part 22 Rules)		
Protection of soil and sediment ¹	The proposed TCRA will use cleanup standards as set forth in the Action Memorandum signed April 1, 2020. For the remedial cleanup standards that will be established in the FS and ROD, the Part 201 MCL 324.20120a and 324.20120b authorize development of site-specific cleanup criteria if such criteria, in comparison to generic criteria, better reflect best available information concerning the toxicity or exposure risk posed by the hazardous substance or other factors.	Cleanup standards for soil and sediment - applicable	Michigan NREPA, Part 201 (Environmental Protection), MCL 324.20101-20142	X	X
Protection of soil and sediment ¹	Part 201 generic criteria apply to exceedances except where site-specific criteria are developed; administrative rules apply to the development of criteria Establishes screening levels and generic cleanup criteria for soils in the State. Part 201 provides for the identification, risk assessment, evaluation, remediation, and long-term management of contaminated sites within the state. Part 201 provides that response actions shall be protective of human health, safety, welfare, and the environment of the state and identifies risk levels to be used in the development of those response actions.	Screening levels and generic cleanup criteria for soils and sediment - applicable	Michigan NREPA, Part 201 (Environmental Remediation), MCL 324.20101-20142 Mich. Admin. Code R. 299.1-299.50	X	X
Protection of soil and sediment	Establishes requirements for handling, storage, and disposal of PCB-containing materials, including PCB remediation waste, in excess of 50 mg/kg. Applicable for PCB-containing materials that are removed from the Site. Establishes performance standards for disposal technologies. Soils containing PCBs at concentrations >50 mg/kg can be incinerated, treated with an equivalent method, or landfilled at licensed chemical waste landfill. Industrial sludge with PCB concentrations in excess of 500 mg/kg may not be landfilled. Spill cleanup policy establishes cleanup criteria for spills after 5/4/87. Soil cleanup levels: Unrestricted access - 10 mg/kg, restricted access - 25 mg/kg.	PCB concentrations in soil and/or sediment - relevant and appropriate	40 CFR Part 761.60 - 761.79 Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions (Toxic Substance Control Act [TSCA] Regulations) OSWER Directive 9356.4-01 Guidance on Remedial Actions for Superfund Sites with PCB Contamination	X	X
Protection of soil and sediment	Guidance on remedial actions for Superfund sites containing PCBs. May be used as a guideline for handling PCB-contaminated sediment/soil.	PCB concentrations in soil and/or sediment at CERCLA sites - TBC	EPA Guidance EPA/540/S-93/506	X	X
Protection of soil and sediment	Guidance on technology alternatives for the remediation of PCB-contaminated soil and sediment.	Remedial actions for PCB-contaminated soil and sediment - TBC	Technology Alternatives for the Remediation of PCB- Contaminated Soil and Sediment	X	X
Protection of soil and sediment	Guidance on re-evaluation of dioxin risk at Superfund sites	Risk evaluation for dioxin-contaminated soil and sediment - TBC	EPA Memorandum, dated March 27, 2013, Procedure for Re-evaluation of Dioxin Risk at Region 5 Remedial Superfund Sites	X	X
Protection of surface water	Establishes water quality requirements for surface waters in the State. Part 4 rules specify standards for all waters of the State, and require that all designated uses of the receiving water be protected, including aquatic life and wildlife. Applicable to remedial activities. The approved water quality standard for protection of wildlife and human health are 1.2 x 10 ⁻⁴ µg/L and 2.6 x 10 ⁻⁵ µg/L PCBs, respectively. Prior Substantive Requirement Documents (SRDs) at the Site have specified PCB discharge limitations of 2.6 x 10 ⁻⁴ µg/L.	Discharges to waters of the State of Michigan -- standards are applicable to venting groundwater, storm water, and discharges associated with remedial action - relevant and appropriate, except as noted in citation	Michigan NREPA, MCL 324.3101-3133; Mich. Admin. Code R323.1041-1097, R323.1100-1117 (Part 4 Rules), and R323.1201-1221 (Part 8 Rules). R323.1098, Michigan's Antidegradation Rule, is relevant but not appropriate for this site. The Antidegradation Rule may be relevant and appropriate when TMDLs are established for PCBs entering the Kalamazoo River	X	X
Protection of soil	Establishes screening levels and generic cleanup criteria for soils in the State.	PCB concentrations in sediment/soil -- would apply if federal requirements were less stringent. Here, because site-specific cleanup criteria are set at 2.5 and 11 mg/kg, Michigan's criteria are relevant but not appropriate for the floodplains.	Mich. Admin. Code R. 299.1-299.50		
Risk-based sediment criteria for PCBs	Part 201 generic sediment cleanup criteria are not available. Site-specific cleanup criteria may be required to address multiple exposure scenarios. These standards may be used in determining site-specific PCB cleanup levels.	Would apply to development of site-specific cleanup criteria for PCBs in sediment; the cancer (1 in 100,000) and noncancer (10 ⁻⁶) risk standards in Michigan's NREPA can be more protective than the EPA standards, and therefore would be relevant and appropriate	Michigan NREPA, MCL 324.20120a, 324.20120b	X	
Risk-based soil criteria	Protocol for developing site-specific human exposure concentrations over a representative exposure area (e.g., a residential back yard) for PCBs in soil. Concentrations are back-calculated from various cancer risk thresholds and non-cancer hazard indices based on a combination of site-specific characteristics and site-specific exposure assumptions. Site-specific PCB risk-based thresholds in soil (CDM 2003b): Residential: Carcinogenic at 1x10 ⁻⁶ risk: 2.5 mg/kg Non-carcinogenic at HI = 1: 15 mg/kg Recreational: Carcinogenic at 1x10 ⁻⁷ risk: 23 mg/kg Non-carcinogenic at HI = 1: 139 mg/kg Part 201 soil criteria for non-PCB constituents may be relevant and appropriate for residential parcels that do not have institutional controls or restrictive covenants. Site-specific TEQ risk-based thresholds in soil: Mammalian receptors: 1,000 ng/kg Avian receptors: 7,000 ng/kg Recreational: 1,330 ng/kg	PCB concentrations in floodplain soil; site-specific human health risk assessment per CERCLA guidance - TBC Michigan's NREPA could be relevant and appropriate	Risk Assessment Guidance for Superfund Volume 1, Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals), EPA/540/R-92/003, December 1991. Michigan NREPA, MCL 324.20120a, 324.20120b		X
Protection of surface water, soil, and floodplains	Establishes permit requirements for alteration of floodplains and discharges to surface waters. Applicable if remedial alternatives involve construction in floodplains.	Water Quality Standards for discharges to waters of the State of Michigan classified for wildlife use and human health, and alteration of floodplains - relevant and appropriate	Michigan NREPA Part 31 (Water Resources Protection) Mich. Admin. Code R323.1041 and R323.1311 - R323.1329		X
Fish Tissue Residue Criterion for PCBs ¹	Provides guidelines and information for public to make decisions about health risks of consuming fish that contain environmental contaminants.	PCBs in fish tissue residue - TBC	Michigan Fish Consumption Advisory Program Guidance Document dated September 14, 2016. https://www.michigan.gov/documents/mdch/MFCAP_Guidance_Document_500546_7.pdf		
Fish Consumption Advisories as issued by the Michigan Department of Health and Human Services ¹	Fish Contaminant Advisories (FCAs) apply to various species of fish in the Kalamazoo River. The consumption guidelines are based on data collected and analyzed annually, and provide the public with the information needed to make decisions to protect themselves and their families from the health risks of consuming fish that contain environmental contaminants. The Michigan Eat Safe Fish Guide for Southwest Michigan provides fish consumption advice for Kalamazoo River by fish species and fish length. The Michigan Eat Safe Fish Consumption Guide provides fish consumption advice for the Kalamazoo River by fish species and fish length. The FCAs are not regulatory requirements and are not enforced by legal authority, however, Michigan's administrative rules identify FCAs and other impairments as limitations that must be eliminated, and mandates their consideration in the development of cleanup criteria for surface water and surface water sediments. Mich Admin Code R. 299.30. The existence of FCAs may also be useful as a metric of the effectiveness of the response actions in the future.	Fish Contaminant Advisories (FCAs) - TBC	Michigan Department of Health and Human Services (MDHHS) Fish Consumption Advisory 2018 https://www.michigan.gov/documents/mdch/MDCH_EAT_SAFE_FISH_GUIDE_-_SOUTHWEST_MI_WEB_455360_7.pdf		
Fish tissue residue criterion for PCBs	The Michigan Department of Health and Human Services (MDHHS) has issued guidelines to provide the public with the information needed to make decisions to protect themselves and their families from the health risks of consuming fish that contain environmental contaminants.	PCBs in fish tissue residue - TBC	Michigan Department of Health and Human Services (MDHHS) Fish Consumption Advisory, Eat Safe Fish Guide, 2018. www.michigan.gov/eatsafe/fish	X	

Notes:
1 These ARARs have been identified by EGLE in May 2020.
References
MDCH 2014. Michigan Fish Consumption Advisory Program Guidance Document. http://www.michigan.gov/documents/mdch/MDCH_MFCAP_Guidance_Document_417043_7.pdf
TMDLs - total maximum daily load standards
EGLE - Michigan Department of Environmental Quality

Table 3. Federal and State Location-Specific Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considereds (TBCs)
Area 4 Removal Work Plan
Area 4 TCRA, OUS Area 4 TCRA Allied Paper Inc./Portage Creek/Kalamazoo River Superfund Site

Location	Requirements	Prerequisite	Citation	Applicable to Sediment/Soil	
				Sediment	Soil
Presence of farmland as indicated in Farmland Protection Policy Act (FPPA) of 1981 7 USC 4201, et seq	The purpose of the law is to "...minimize the extent to which Federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses..." (P.L. 97-98, Sec. 1539-1540; 7 U.S.C. 4201, et seq.). The FPPA also stipulates that federal programs be compatible with state, local and private efforts to protect farmland. For the purposes of the law, federal programs include construction projects—such as highways, airports, dams and federal buildings—sponsored or financed in whole or part by the federal government, and the management of federal lands.	Federal actions that involve potential conversion of farmland to non-agricultural areas - relevant and appropriate	Farmland Protection Policy Act of 1981		X
Presence of Kalamazoo River, a direct link to surface waters of the Great Lakes	Applicable to action or activity by any source, point or nonpoint, of pollutants that is anticipated to result in an increased loading of bioaccumulative contaminants of concern to surface waters of the Great Lakes.	Remedial actions that are anticipated to result in increased loading of bioaccumulative contaminants in the surface water of the Kalamazoo River and, in turn, the Great Lakes - relevant and appropriate	40 CFR Part 132, Appendix E Great Lakes Water Quality Initiative Antidegradation Policy	X	
Floodplains: Protection of surface water, soil, and floodplains ¹	Establishes requirements for alteration or occupation of floodplains and discharges to surface waters.	Substantive requirements would apply for response actions involving construction or response actions in floodplains - relevant and appropriate	Michigan NREPA, MCL 324.3108; Part 13 Floodplain rules at Mich Admin Code R. 323.1311-323.1329.		X
Floodplains: Protection of surface water, soil, and floodplains ¹	Used as guidance for preventing harmful interference in a stream under Part 31.	The floodplain authority found in Part 31 requires that no one augment flow in a stream such that it causes a harmful interference. Harmful interference is essentially any rise in flood stages that would negatively impact an insurable structure. The report guidelines outline when modeling is required and what the modeling must show to be evaluated for harmful interference. - TBC	Michigan Department of Environment, Great Lakes, and Energy Hydraulic Report Guidelines dated May 2019 https://www.michigan.gov/documents/deq/wrd-trans-hydraulic-report-guide_411699_7.pdf		X
Activities in inland lakes or streams to complete response actions ¹	Regulates dredging or filling of lake or stream bottoms; obstructing or altering flow; and constructing, placing or removing a structure on bottomlands; establishes mitigation requirements.	Activities that are part of response actions, such as shore protection, seawall/sheet piling, placement of riprap, constructing cofferdams, excavating stream banks, and dredging below the ORWL, for example, may be affected by these regulations. The statute specifically requires consideration of possible effects on waters flow and usage, including for recreation, and fish and wildlife. - applicable	Michigan NREPA, Part 301 (Inland Lakes and Streams), MCL 324.30101-30113; Mich Admin Code R. 281.811-845	X	X
Wetlands: Dredging, filling, or other adverse impacts in wetlands ¹	Establishes the rules regarding wetland uses, the permit application process, and mitigation and restoration requirements for unavoidable impacts to regulated wetlands. Defines what is considered regulated wetlands.	Michigan has assumed administration of Section 303 of the CWA. Projects meeting state requirements will generally meet the requirements of Section 404(b)(1) of the CWA. Wetlands must be delineated. Response actions that impact wetlands through dredging or other use of a wetland area affected; substantive requirements of the Part 303 permit must be attained and monitoring required. - relevant and appropriate	Michigan NREPA, Part 303 (Wetland Protection), MCL 324.30301-30329; Mich Admin Code R. 281.921-925; R. 281.951-961	X	X
Fish Consumption Advisories as issued by the Michigan Department of Health and Human Services ¹	Fish Contaminant Advisories (FCAs) apply to various species of fish in the Kalamazoo River. The consumption guidelines are based on data collected and analyzed annually, and provide the public with the information needed to make decisions to protect themselves and their families from the health risks of consuming fish that contain environmental contaminants. The Michigan Eat Safe Fish Guide for Southwest Michigan provides fish consumption advice for Kalamazoo River by fish species and fish length.	The Michigan Eat Safe Fish Consumption Guide provides fish consumption advice for the Kalamazoo River by fish species and fish length. The FCAs are not regulatory requirements and are not enforced by legal authority; however, Michigan's administrative rules identify FCAs and other impairments as limitations that must be eliminated, and mandates their consideration in the development of cleanup criteria for surface water and surface water sediments. Mich Admin Code R. 299.30. The existence of FCAs may also be useful as a metric of the effectiveness of the response actions in the future. - TBC	Michigan Department of Health and Human Services (MDHHS) Fish Consumption Advisory 2018 https://www.michigan.gov/documents/mdchMDCH_EAT_SAFE_FISH_GUIDE_-_SOUTHWEST_MI_WEB_455360_7.pdf		
Presence of floodplain, designated as such on a map	Shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains.	Federal actions that involve potential impacts to, or take place within, floodplains - applicable	Executive Order 11988 - Floodplain Management, Section 1.	X	X
Presence of floodplain, designated as such on a map	Shall consider alternatives to avoid, to the extent possible, adverse effects and incompatible development in the floodplain. Design or modify its action in order to minimize potential harm to or within the floodplain.	Federal actions that involve potential impacts to, or take place within, floodplains - applicable	Executive Order 11988 - Floodplain Management, Section 2(a)(2)	X	X
Presence of floodplain, designated as such on a map	If there is no practicable alternative to locating in or affecting the floodplain, the potential harm to the floodplain shall be minimized. The natural and beneficial values of floodplains shall be restored and preserved.	Federal actions that involve potential impacts to, or take place within, floodplains - applicable	40 C.F.R. Part 6, App. A, § 6(a)(5)	X	X
Presence of floodplain, designated as such on a map	Structures and facilities must be constructed in accordance with existing criteria and standards set forth under the National Flood Insurance Program (NFIP) and must include mitigation of adverse impacts wherever feasible. If newly constructed structures or facilities are to be located in a floodplain, accepted floodproofing and other flood protection measures shall be undertaken. To achieve flood protection, EPA shall, wherever practicable, elevate structures above the base flood level rather than filling land.	Construction of structures and facilities within floodplains - applicable	40 C.F.R. Part 6, App. A, § 6(c)(1) & (2)	X	X
Presence of floodplain, designated as such on a map; discharge to surface water	Establishes permit requirements for alteration of floodplains and discharges to surface waters.	Substantive requirements would apply if remedial alternatives involve construction in floodplains - relevant and appropriate	Michigan NREPA, Part 13 (Floodplains), MCL 324.3108; Mich. Admin. Code R. 323.1311-323.1329		X
Presence of federally endangered or threatened species, as designated in 50 C.F.R. §§ 17.11 and 17.12 -or- critical habitat of such species listed in 50 C.F.R. § 17.95	Actions that jeopardize the existence of a listed species or result in the destruction or adverse modification of critical habitat must be avoided or reasonable and prudent mitigation measures taken.	Action that is likely to jeopardize fish, wildlife, or plant species or destroy or adversely modify critical habitat— relevant and appropriate	16 U.S.C. § 1538(a)	X	X
Presence of federally endangered or threatened species, as designated in 50 C.F.R. §§ 17.11 and 17.12 -or- critical habitat of such species listed in 50 C.F.R. § 17.95	Each federal agency shall, in consultation with and with the assistance of the Secretary [of DOI], insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by [DOI] to be critical.	Actions authorized, funded, or carried out by any Federal agency, pursuant to 16 U.S.C. § 1536 - relevant and appropriate	16 U.S.C. § 1536(a)(2); 50 C.F.R. §§ 402.13(a), 402.14	X	X
Presence of endangered or threatened species, as designated in MCL 324.36501-36507	Establishes requirements for conservation, management, enhancement, and protection of species either endangered or threatened with extinction. For certain remedial alternatives, activities may disrupt or disturb endangered species.	Action that is likely to jeopardize fish, wildlife, or plant species or destroy or adversely modify critical habitat — relevant and appropriate	Michigan NREPA, Part 365 (Endangered Species Protection), MCL 324.36501-36507	X	X
Presence of migratory birds, as defined by 50 C.F.R. § 10.13	It shall be unlawful to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or eggs of any such bird.	Federal actions that have, or are likely to have, a measurable negative effect on migratory bird populations - relevant and appropriate	16 U.S.C. § 703(a)	X	X
Presence of archaeologically or historically sensitive area	Establishes procedures to provide for preservation of historical and archaeological data which might be destroyed through alteration of terrain as a result of a federal construction project for a federal licensed activity or program. Historic or archaeological value is currently unknown.	Location of historically or archaeologically significant areas in Area 4 - relevant and appropriate	40 CFR Part 6.301(c)	X	X
Presence of archaeologically or historically sensitive area	The NAGPRA act requires federal agencies and museums with possession or control over Native American human remains and associated funerary objects to compile an inventory of such items. It requires federal agencies and museums with possession or control over Native American non-associated funerary objects, sacred objects, or objects of cultural patrimony to provide a written summary of such objects. It prescribes when a federal agency or museum must return Native American cultural items. This regulation is only applicable if Native American remains or funerary objects are in Area 4.	Applies if Native American remains or funerary objects are discovered in Area 4 - relevant and appropriate	43 CFR Part 10 Excavations and Inadvertent Discoveries		X
Presence of wetlands	Shall take action to minimize the destruction, loss or degradation of wetlands and to preserve and enhance beneficial values of wetlands.	Federal actions that involve potential impacts to, or take place within, wetlands - TBC	Executive Order 11990 - Protection of Wetlands, Section 1(a)	X	X
Presence of wetlands	Shall avoid undertaking construction located in wetlands unless: (1) there is no practicable alternative to such construction, and (2) the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.	Federal actions that involve potential impacts to, or take place within, wetlands - TBC	Executive Order 11990 - Protection of Wetlands, Section 2(a)	X	X
Location encompassing aquatic ecosystem as defined in 40 C.F.R. § 230.3(c)	No discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.	Action that involves discharge of dredged or fill material into waters of the United States, including wetlands - relevant and appropriate	40 C.F.R. § 230.10(a)	X	
Location encompassing aquatic ecosystem as defined in 40 C.F.R. § 230.3(c)	No discharge of dredged or fill material shall be permitted if it: • Causes or contributes, after consideration of disposal site dilution and dispersion, to violations of any applicable State water quality standard; • Violates any applicable toxic effluent standard or prohibition under Section 307 of the Clean Water Act. • Jeopardizes the continued existence of species listed as endangered or threatened under the Endangered Species Act of 1973, or results in the likelihood of the destruction or adverse modification of critical habitat; • Violates any requirement imposed by the Secretary of Commerce to protect any marine sanctuary designated under title III of the Marine Protection, Research, and Sanctuaries Act of 1972.	Action that involves discharge of dredged or fill material into waters of the United States, including wetlands - relevant and appropriate	40 C.F.R. § 230.10(b)	X	
Location encompassing aquatic ecosystem as defined in 40 C.F.R. § 230.3(c)	No discharge of dredged or fill material shall be permitted which will cause or contribute to significant degradation of the waters of the United States.	Action that involves discharge of dredged or fill material into waters of the United States, including wetlands - relevant and appropriate	40 C.F.R. § 230.10(c)	X	
Location encompassing aquatic ecosystem as defined in 40 C.F.R. § 230.3(c)	No discharge of dredged or fill material shall be permitted unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem.	Action that involves discharge of dredged or fill material into waters of the United States, including wetlands - relevant and appropriate	40 C.F.R. § 230.10(d)	X	

**Table 3. Federal and State Location-Specific Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considereds (TBCs)
Area 4 Removal Work Plan
Area 4 TCRA, OUS Area 4 TCRA Allied Paper Inc./Portage Creek/Kalamazoo River Superfund Site**

Location	Requirements	Prerequisite	Citation	Applicable to Sediment/Soil	
				Sediment	Soil
Presence of any stream or other body of water proposed to be impounded, diverted, controlled, or modified for drainage	Whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatever, including navigation and drainage, by any department or agency of the United States, or by any public or private agency under federal permit or license, such department or agency first shall consult with the U. S. Fish and Wildlife Service, Department of the Interior, and with the head of the agency exercising administration over the wildlife resources of the particular State wherein the impoundment, diversion, or other control facility is to be constructed, with a view to the conservation of wildlife resources by preventing loss of and damage to such resources as well as providing for the development and improvement thereof in connection with such water-resource development.	Federal actions that propose to impound, divert, control, or modify waters of any stream or body of water - relevant and appropriate	16 U.S.C. § 662(a)	X	X
Presence of contamination requiring remedial action, risk assessment, and environmental response activities.	Establishes rules specifying environmental response, risk assessment, remedial action, and site cleanup criteria. Relevant to remedial activities conducted in Area 4.	Occurrence of environmental response, remedial action, and site cleanup - relevant and appropriate	Michigan NREPA Part 201 (Environmental Remediation); Mich Admin Code R324.20101 - R324.20142	X	X
Presence of floodplain as defined in Mich. Admin. Code R324.9101 - R324.9123a	Establishes rules prescribing soil erosion and sedimentation control plans, procedures, and measures. If work is conducted in floodplain areas, a soil erosion and sedimentation control plan may be required to perform earth changes.	State actions that involve potential impacts to, or take place within, a floodplain - relevant and appropriate	Michigan NREPA Part 17 (Michigan Environmental Protection Act); Michigan NREPA Part 91 (Soil Erosion and Sedimentation Control); Mich. Admin. Code R324.9101 - R324.9123a	X	X
Presence of designated environmental area boundary as defined in Mich. Admin. Code R324.32301 - R324.32315	In the absence of an approved local ordinance, any person or agency must first apply for and obtain a permit from the EGLE when proposing to dredge, fill, grade, or otherwise alter the soil, alter the natural drainage, or alter the vegetation on a parcel or property within a designated environmental area boundary.	Activities likely to involve dredging, filling, grading, or other alterations to the soil within an environmental boundary - relevant and appropriate	Michigan NREPA Part 323 (Shorelands Protection and Management); Mich. Admin. Code R324.32301 - R324.32315	X	X
Presence of endangered or threatened species, as designated in Mich. Admin. Code R324.36501 - R324.36507	Establishes rules to provide for conservation, management, enhancement, and protection of species either endangered or threatened with extinction. For certain remedial alternatives, activities may disrupt or disturb endangered species.	Action that is likely to jeopardize fish, wildlife, or plant species or destroy or adversely modify critical habitat - relevant and appropriate	Michigan NREPA Part 365 (Endangered Species Protection); Mich. Admin. Code R324.36501 - R324.36507	X	X
Enactment of fish consumption advisory as defined by Michigan Department of Health and Human Services	The <i>Michigan Eat Safe Consumption Guide</i> provides fish consumption advice for Kalamazoo River by fish species and fish length.	Consumption of fish from Area 4 - TBC	Michigan Department of Health and Human Services (MDHHS) Fish Consumption Advisory, <i>Eat Safe Fish Guide</i> , 2018. www.michigan.gov/eatsafefish	X	X

Notes:

- 1 These ARARs have been identified by EGLE in May 2020.
- EGLE - Michigan Department of Environmental Quality

Table 4. Federal and State Action-Specific Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considereds (TBCs)
Area 4 Removal Work Plan
Area 4 TCRA, OUS Area 4 TCRA Allied Paper Inc./Portage Creek/Kalamazoo River Superfund Site

Action	Requirements	Prerequisite	Citation	Applicable to Sediment/Soil	
				Sediment	Soil
Engagement in remedial activities damaging to fish or wildlife	Requires the U.S. Army Corps of Engineers to develop mitigation plans to repair fish and wildlife damage associated with remedy implementation.	Remedy must not damage to fish and wildlife as indicated in 33 USC §§ 2201-2331 - relevant and appropriate	33 USC § 2201 et seq.	X	
Water quality-based limits for discharge into navigable waters ¹	Prohibits direct or indirect discharge of a substance that is or may become injurious to public health, recreational use, or aquatic life. Establishes effluent standards in accordance with federal WPCA and CWA. Applicable for alternatives involving discharge of water to the river.	Wastes generated from response actions to be discharged to river would be subject to the substantive requirements of Part 31 and the Part 8 and Part 21 rules. - relevant and appropriate	Michigan NREPA, Part 31 (Water Resources Protection), MCL 324.3101 et seq; Mich Admin Code R. 323.1201-1221; R 323.2101-2195.		
Requirements for discharges affecting groundwater ¹	Establishes requirements for discharges of waters or waste to groundwater or to the ground.	Substantive requirements would apply if response actions involve discharges of wastewater or wastes to groundwater or to the ground - relevant and appropriate	Michigan NREPA, Part 31 (Water Resources Protection), MCL 324.3101 et seq; Mich Admin Code R. 323.2201-2240 (Part 22 rules)		
Human health and wildlife risk-based limits for air emissions ¹	Establishes rules prohibiting the emission of air contaminants in quantities that cause injurious effects to human health, animal life, plant life of significant economic value, and/or property.	Air emissions may be generated that create threats to human health. For certain response actions, dust emissions may need to be monitored and controlled, if appropriate. - relevant and appropriate	Michigan NREPA, Part 55 (Air Pollution Control), MCL 324.5501-5542; Mich Admin Code R. 336.1101-2706 (see R. 336-1901)		
Requirements for land undergoing an earth change where more than one acre of land is affected or the regulated action occurs within 500 feet of a lake or stream. ¹	Establishes rules prescribing soil erosion and sedimentation control plans, procedures, and measures.	For any response action involving an earth change, including cut and fill activities that may contribute to soil erosion and sedimentation of surface water, parties must implement and maintain soil erosion and sedimentation control measures. Substantive requirements of permit must be satisfied. - applicable	Michigan NREPA, Part 91 (Soil Erosion and Sediment Control), MCL 324.9101-324.9123a; Mich Admin Code R. 323.1701-1714	X	X
Characterization and proper management of hazardous waste; corrective action obligations, transportation, storage, and disposal of hazardous waste off-site ¹	Establishes requirements for hazardous waste generators, transporters, and treatment/storage/disposal (TSD) facilities.	Part 111 identifies environmental performance standards under Part 201 to satisfy corrective action obligations. Therefore, the substantive requirements of Part 111 and associated rules need to be identified as ARARs. Portions of the regulations may be useful as a means of determining handling and transportation requirements, regardless of whether or not the area of removal qualifies as a TSD facility or a generator of hazardous wastes. Applies to beneficial reuse of materials on-site, including sediments. - applicable	Michigan NREPA, Part 111 (Hazardous Waste Management), MCL 324.1101-11153; Mich Admin Code R. 9101-11007; Michigan is a fully-authorized state for RCRA Subtitle C, therefore Part 111 of the NREPA needs to be identified in the Response Proposal as ARARs.	X	X
Handling and disposal of non-hazardous waste on-site ¹	Establishes rules for solid waste disposal facilities and on-site handling of solid waste. Applies to a response action involving landfilling and on-site handling of solid waste.	Non-hazardous wastes generated from response actions, including but not limited to disposal of soils and sediments, are affected; the substantive requirements of permits and the terms of the applicable county solid waste management plans must be followed - relevant and appropriate	Michigan NREPA, Part 115 (Solid Waste Management), MCL 324.11501 - 11550; Mich Admin Code R. 299.4101-4122	X	X
Storage and handling of liquid industrial wastes ¹	Imposes requirements on generators for storage, documentation, and handling for onsite liquid waste in preparation for transport, for the use of registered haulers, and for the inspection of vehicles and control of the disposal of wastes.	Response actions may require transportation and disposal of liquid waste, and the Part 121 requirements apply to the storage and transport of those wastes - relevant and appropriate	Michigan NREPA, Part 121 (Liquid Industrial Waste), MCL 324.12101 - 12118		
Requirements pertaining to soil relocation ¹	Requirements for movement of contaminated soils on-site or off-site.	Substantive requirements of soil relocation provisions apply to any movement of contaminated soils. - relevant and appropriate	Michigan NREPA, Part 201 (Environmental Remediation), MCL 324.20101-20142; Mich Admin Code R. 299.51001-51021	X	
Response actions that alter, repair, remove, or otherwise affect regulated dams. ¹	Provides requirements for dam construction and maintenance to ensure that dams are properly constructed, inspected and maintained, and that the owners have adequately prepared for potential emergencies. Permits are required for the construction, enlargement, repair, alternation, removal, abandonment and reconstruction of state regulated dams.	Applies to dams over 6' in height and over 5 acres are impounded during the design flood. Substantive requirements apply to response actions that impact regulated dams and surrounding areas - applicable	Michigan NREPA, Part 315 (Dam Safety), MCL 324.31501-31529; Mich Admin Code R. 281.1301-1313		
Presence of endangered or threatened species ¹	Establishes requirements for conservation, management, enhancement, and protection of species either endangered or threatened with extinction.	Applies to actions that are likely to jeopardize fish, wildlife, or plant species or destroy or adversely modify critical habitat. Would not be considered applicable unless Federal endangered species law is less stringent. - relevant and appropriate	Michigan NREPA, Part 365 (Endangered Species Protection), MCL 324.36501-36507; Mich Admin Code R. 299.1021-1028		
Response actions that involve planting or restoration activities ¹	Lists nonnative species that are prohibited or restricted in Michigan; provides authority and procedures for State Natural Resources Commission to add or delete from the list. Provides for a permit for introduction of genetically engineered organisms.	For any proposed or required planting, the requirements of Part 413 will apply to the selection or introduction of plant species. - relevant and appropriate	Michigan NREPA, Part 413 (Transgenic and Nonnative Organisms), MCL 324.41301-41325		
Maintaining safe conditions during response actions. ¹	Establishes the rules for safety standards in the workplace.	For certain response actions, activities may be restricted by these regulations. - applicable	MCL 408.1001-1094; some of the MIOSHA rules including Part 4 through 13 of the All Industry Administrative Rules, Parts 1-31 of Construction Safety Standards Commission Rules, Part 1-63 of the General Industry Safety Standards Commission Rules, and Parts 301-681 of the Occupational Health Standards Commission Rules.		
Water quality-based limits for discharge into navigable waters	Regulates any federally-authorized activity which may result in any discharge into navigable waters and requires reasonable assurance that the action will comply with state applicable water quality standards.	Dredging activities are considered to impact discharge to navigable waters as defined in Section 401, Clean Water Act - relevant and appropriate	Clean Water Act (CWA) 33 USC §§ 1341 Section 401	X	
Risk-based limits protective of human health for air emissions associated with soil and sediment removal	Establishes ambient air quality standards for protection of public health.	Air emissions are generated that create threats to human health as defined in 40 CFR Part 50 - relevant and appropriate	40 CFR Part 50 National Primary and Secondary Ambient Air Quality Standards	X	X
Risk-based limits protective of human health for air emissions associated with soil and sediment removal	Establishes filing requirements and standards for constituent emission rates in accordance with National Ambient Air Quality Standards (NAAQS). To be considered for remedial alternatives that include removal of sediment/soil.	Air emissions are generated that create threats to human health as defined in 40 CFR Part 50 - relevant and appropriate	40 CFR Part 52 Approval and Promulgation of Implementation Plans	X	X
Protection of soil and sediment	Establishes requirements for handling, storage, and disposal of PCB-containing materials, including PCB remediation waste in excess of 50 mg/kg. Applicable for PCB-containing materials that are removed from the Site. Establishes performance standards for disposal technologies. Soils containing PCBs at concentrations in excess of 50 mg/kg can be incinerated, treated with an equivalent method, or landfilled at a licensed chemical waste landfill. Industrial sludge with PCB concentrations in excess of 500 mg/kg may not be landfilled. Spill cleanup policy establishes cleanup criteria for spills after 5/4/87. Soil cleanup levels: Unrestricted access - 1 to 10 mg/kg, restricted access - 10 to 50 mg/kg.	Actions which address soil and/or sediment containing PCBs - relevant and appropriate	40 CFR Part 761.60 - 761.79 Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions (Toxic Substance Control Act (TSCA) Regulations)	X	X
Transportation of hazardous waste off-site	Defines threshold levels and criteria to determine whether material is hazardous waste.	Waste generated from remedial process and analyzed in accordance with 40 CFR Part 261 - relevant and appropriate	40 CFR Part 261 Identification and Listing of Hazardous Waste	X	X

Table 4. Federal and State Action-Specific Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considereds (TBCs)

Area 4 Removal Work Plan

Area 4 TCRA, OU5 Area 4 TCRA Allied Paper Inc./Portage Creek/Kalamazoo River Superfund Site

Action	Requirements	Prerequisite	Citation	Applicable to Sediment/Soil	
				Sediment	Soil
Transportation of hazardous waste off-site	Includes manifest, record-keeping, and other requirements applicable to generators of hazardous waste.	Waste generated from remedial process and transported off-site for storage and/or disposal - relevant and appropriate	40 CFR Part 262 Standards Applicable to Generators of Hazardous Waste	X	X
Transportation of hazardous waste off-site	Sets forth standards for transporters of hazardous wastes, including the receipt of an EPA identification number and manifesting requirements.	Waste generated from remedial process and transported off-site for storage and/or disposal - relevant and appropriate	40 CFR Part 263 Standards Applicable to Transporters of Hazardous Waste	X	X
Transportation, storage, and disposal of hazardous waste off-site	Includes management standards including record keeping, requirements for particular units such as tanks or containers, and other requirements applicable to owners and operators of hazardous waste treatment, storage and disposal facilities.	Waste generated from remedial process and transported off-site for storage and/or disposal in accordance with 40 CFR Part 264 - relevant and appropriate	40 CFR Parts 264 and 265 Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities	X	X
Disposal of samples and remedial waste	Places land disposal restrictions, including treatment standards and related testing, tracking and record keeping requirements on hazardous waste.	Waste generated from remedial process and analyzed samples transported off-site for disposal in accordance with 40 CFR Part 268 - relevant and appropriate	40 CFR Part 268 Land Disposal Restrictions	X	X
Disposal of samples and remedial waste	Identifies disposal requirements for various PCB and TEO waste types	PCB waste storage and disposal in accordance with 40 CFR Part 761.50 - relevant and appropriate	40 CFR Part 761.50 Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions: Storage and Disposal, Applicability	X	X
Disposal of waste material off-site	Cleanup and disposal options for PCB remediation waste, which includes PCB-contaminated sediments and dredged materials. Disposal options for PCB remediation waste include disposal in a high-temperature incinerator, an approved chemical waste landfill, or a facility with a coordinated approval under 40 CFR Part 761.77. PCB remediation waste containing PCBs at concentrations less than 50 mg/kg may be disposed of off-site in an approved land disposal facility for the management of municipal solid waste, or in a disposal facility approved under 40 CFR Part 761. 40 CFR Part 761.61(c) allows an EPA Regional Administrator to approve a risk-based disposal method that will not pose an unreasonable risk of injury to human health or the environment.	Sediment waste with PCB concentrations less than 50 mg/kg generated from remedial process and transported off-site for storage and/or disposal in accordance with 40 CFR Part 761.61 - relevant and appropriate	40 CFR Part 761.61 PCB Remediation Waste	X	X
Storage of hazardous waste on-site	Storage requirements: Establishes technical requirements for temporary storage of PCB wastes prior to treatment or disposal.	PCB wastes generated on-site with storage needs defined in 40 CFR Part 761.65 - relevant and appropriate	40 CFR Part 761.65 Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions: Storage for Disposal	X	X
Decontamination of equipment used in remedial activities	Decontamination standards and procedures for removing PCBs that are regulated for disposal from water, organic liquids, and other materials.	Decontamination necessary for equipment, water, organic liquids, or other materials contaminated with PCBs during remedial activities 40 CFR Part 761.79 - relevant and appropriate	40 CFR Part 761.79 Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions: Decontamination standards and procedures	X	X
Technology-based water quality discharge limits	Best available technology and monitoring requirements.	Wastewater generated in remedial process to be discharged - relevant and appropriate	40 CFR Part 122.44 (e.x) Establishing Limitations, Standards, and Other Permit Conditions	X	X
Technology-based water quality discharge limits	Establishes criteria and standards for imposing technology-based treatment requirements.	Wastewater generated in remedial process to be discharged - relevant and appropriate	40 CFR Part 125 Criteria and Standards for the National Pollutant Discharge Elimination System	X	X
Disposal of dredged or fill material on-site	These regulations apply to all existing, proposed, or potential disposal sites for discharges of dredged or fill materials into waters of the U.S., which include wetlands. Includes special policies, practices, and procedures to be followed by the U.S. Army Corp of Engineers in connection with the review of applications for permits to authorize the discharge of dredged or fill material into waters of the United States pursuant to Sections 301 and 404 of the CWA. In accordance with CERCLA Section 121(e), a permit is not required for on-site CERCLA response actions, although the selected remedy will comply with substantive requirements of these regulations.	Dredged or fill materials will be disposed of on-site, in a wetland area as defined in 40 CFR Part 231, Section 301 Effluent Standards, Section 404(c) Procedures, and 33 CFR Parts 320-330 - relevant and appropriate	40 CFR Part 231 Section 301 Effluent Standards Section 404(c) Procedures 33 CFR Parts 320-330 Navigation and Navigable Waters	X	X
Treatment of wastewater generated from remediation process	Establishes responsibilities of federal, state, and local government, industry and the public to implement National Pretreatment Standards to control pollutants which pass through or interfere with treatment processes in Publicly Owned Treatment Works (POTWs). Provides guidelines establishing test procedures for the analysis of pollutants.	Remedial actions generate waste that will pass through or interfere with treatment processes in POTWs as defined in 40 CFR Part 403 and 40 CFR Part 136 - relevant and appropriate	40 CFR Part 403 General Pre-Treatment Regulations for Existing and New Sources of Pollution 40 CFR Part 136 Guidelines Establishing Test Procedures for the Analysis of Pollutants	X	X
Remedial activities on-site include dredging, filling, etc.	Prohibits unauthorized obstruction or alteration of any navigable water in the U.S. (dredging, filling, cofferdams, piers, etc.). Remedial activities may have to be conducted in such a way as to avoid obstruction or alteration of the waterway.	The Kalamazoo River altered by dredging, filling, etc. to complete remedial actions - relevant and appropriate	33 CFR Parts 320-330 Navigation and Navigable Waters	X	
Remedial activities on-site include dredging, filling, etc.	Requirements for permits affecting "navigable waters of the U.S." If excavation or capping activities are performed, the substantive requirements of the Act must be met for work affecting "navigable waters of the United States."	The Kalamazoo River altered by dredging, filling, etc. to complete remedial actions - relevant and appropriate	33 CFR Part 322 Permits for Structures or Work in or Affecting Navigable Waters of the United States	X	
Transportation, storage, and disposal of hazardous waste off-site	Transportation and handling requirements for hazardous materials, including procedures for the packaging, labeling, manifesting and transporting of hazardous materials. This would apply to alternatives where sediment/soil are removed and transported from Area 4.	Contaminated, hazardous soil and sediment are removed and transported off-site for storage and/or disposal as defined by 49 CFR Part 107, 49 CFR Part 171, and 49 CFR Part 172 - relevant and appropriate	49 CFR Part 107 Hazardous Materials Program Procedures 49 CFR Part 171 General Information, Regulations and Definitions 49 CFR Part 172 Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements	X	X
Human health and risk-based limits for air emissions	Establishes 8-hour time-weighted average air concentrations for particulates and PCBs for protection of worker breathing zones, PPE requirements, medical monitoring requirements, respiratory protection requirements, and HAZMAT training requirements. Establishes health and safety requirements for cleanup operations at NPL sites. Site is listed on NPL.	Air emissions are generated during remedial activities that create threats to human health as defined in 29 CFR Part 1910 Subpart I - TBC	29 CFR Part 1910 Subpart I, Personal Protective Equipment (General Industry); also Parts 1904 and 1926	X	X
Disposal of dredged or fill material	Guidelines for Specification of Disposal Sites for Dredged or Fill Material. Except as otherwise provided under CWA § 404(b)(2), no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. If there is no other practical alternative, impacts must be minimized. Includes criteria for evaluating whether a particular discharge site may be specified.	Disposal of dredged or fill materials will create adverse environmental impacts in proposed disposal site - relevant and appropriate	40 CFR Part 230 Guidelines for Specification of Disposal Sites for Dredged or Fill Material.	X	X
Waste characterization of dredged or fill material	Testing manual establishes procedures for determining the potential for contaminant-related impacts associated with discharge of dredged material in inland waters.	Dredged or fill wastes generated in the remedial process for disposal off-site as defined in Department of Army, U.S. Army Corps of Engineers Directive and 33 CFR Part 323 - TBC	33 CFR Part 323 Permits for Discharges of Dredged or Fill Material Into Waters of the United States Department of Army Army Corps of Engineers Directive		U.S X
Transportation and handling of contaminated sediments	Guidance designed to assist EPA staff managing sediment sites by providing a thorough overview of methods that can be used to reduce risk caused by contaminated sediment. Must determine if solid waste is excluded from regulation under 40 C.F.R. § 261.4(b); and determine if waste is listed as hazardous waste under subpart D 40 C.F.R. Part 261.	Dredged or fill wastes generated in the remedial process for handling/transportation off-site as defined in EPA-540-R-05-012, OSWER 9355-0-85 - TBC	EPA-540-R-05-012, OSWER 9355-0-85	X	
Characterization of solid waste (all primary and secondary wastes)	Must determine whether the waste is (characteristic waste) identified in subpart C of 40 CFR part 261 by either: (1) Testing the waste according to the methods set forth in subpart C of 40 CFR part 261, or according to an equivalent method approved by the Administrator under 40 CFR 260.21; or (2) Applying knowledge of the hazard characteristics of the waste in light of the materials or the processes used.	Generation of solid waste as defined in 40 C.F.R. § 261.2 - applicable	40 C.F.R. § 262.11	X	X
Characterization of solid waste (all primary and secondary wastes)	Must refer to Parts 261, 262, 264, 265, 266, 268, and 273 of Chapter 40 for possible exclusions or restrictions pertaining to management of the specific waste.	Generation of solid waste which is determined to be hazardous waste - applicable	40 C.F.R. § 262.11(g)	X	X
Characterization of hazardous waste (all primary and secondary wastes)	Must obtain a detailed chemical and physical analysis on a representative sample of the waste(s), which at a minimum contains all the information that must be known to treat, store, or dispose of the waste in accordance with pertinent sections of 40 C.F.R. Parts 264 and 268. Must determine each EPA Hazardous Waste Number (waste code) applicable to the waste in order to determine the applicable treatment standards under 40 C.F.R. Part 268 et seq. Note: This determination may be made concurrently with the hazardous waste determination required in Sec. 262.11 of this chapter.	Generation of RCRA-hazardous waste for storage, treatment or disposal - applicable	40 C.F.R. § 264.13(a)(1)	X	X
Determinations for management of hazardous waste	Must determine the underlying hazardous constituents [as defined in 40 C.F.R. § 268.2(i)] in the waste.	Generation of hazardous waste for storage, treatment or disposal - applicable	40 C.F.R. § 268.9(a)	X	X
Determinations for management of hazardous waste	Must determine if the hazardous waste meets the treatment standards in 40 C.F.R. §§ 268.40, 268.45, or 268.49 by testing in accordance with prescribed methods or use of generator knowledge of waste.	Generation of RCRA characteristic hazardous waste for storage, treatment or disposal - applicable	40 C.F.R. § 268.9(a)	X	X
Determinations for management of hazardous waste	Note: This determination can be made concurrently with the hazardous waste determination required in 40 CFR 262.11. A generator may accumulate RCRA hazardous waste on-site if the facility provided that: • Waste is placed in containers that comply with 40 C.F.R. §§ 265.171-173; and • The date upon which accumulation begins is clearly marked and visible for inspection on each container; and • Container may be marked with other words that identify the contents; and • Container is marked with the words "hazardous waste".	Generation of RCRA characteristic hazardous waste for storage, treatment or disposal - applicable	40 C.F.R. § 268.7(a)	X	X
Temporary on-site storage of hazardous waste in containers (e.g., excavated sediments and soils)		Accumulation of RCRA hazardous waste on-site as defined in 40 C.F.R. § 260.10 - applicable	40 C.F.R. § 262.34(a)(1)(i); 40 C.F.R. § 262.34(a)(2) &(3); 40 C.F.R. § 262.34(c)(1)	X	X
Use and management of hazardous waste in containers	If container is not in good condition (e.g., severe rusting, structural defects) or if it begins to leak, must transfer waste into container in good condition. Use container made or lined with materials compatible with waste to be stored so that the ability of the container is not impaired. Keep containers closed during storage, except to add/remove waste. Open, handle and store containers in a manner that will not cause containers to rupture or leak. Containers having capacity greater than 30 gallons must not be stacked over two containers high.	Storage of RCRA hazardous waste in containers - applicable	40 C.F.R. § 265.171 40 C.F.R. § 265.172 40 C.F.R. § 265.173	X	X
Storage of hazardous waste in container area	Area must have a containment system designed and operated in accordance with 40 C.F.R. § 264.175(b).	Storage of RCRA hazardous waste in containers with free liquids - applicable	40 C.F.R. § 264.175(e)	X	X
Storage of hazardous waste in container area	Area must be sloped or otherwise designed and operated to drain liquid from precipitation or containers must be elevated or otherwise protected from contact with accumulated liquid.	Storage of RCRA-hazardous waste in containers that do not contain free liquids (other than F020, F021, F022, F023, F026 and F027) - applicable	40 C.F.R. § 264.175(c)	X	X

Table 4. Federal and State Action-Specific Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considereds (TBCs)

Area 4 Removal Work Plan
Area 4 TCRA, OUS Area 4 TCRA Allied Paper Inc./Portage Creek/Kalamazoo River Superfund Site

Action	Requirements	Prerequisite	Citation	Applicable to Sediment/Soil	
				Sediment	Soil
Closure of RCRA container storage unit	At closure, all hazardous waste and hazardous waste residues must be removed from the containment system. Remaining containers, liners, bases, and soils containing or contaminated with hazardous waste and hazardous waste residues must be decontaminated or removed. [Comment: At closure, as throughout the operating period, unless the owner or operator can demonstrate in accordance with 40 CFR 261.3(d) of this chapter that the solid waste removed from the containment system is not a hazardous waste, the owner or operator becomes a generator of hazardous waste and must manage it in accordance with all applicable requirements of parts 262 through 266 of this chapter].	Storage of RCRA hazardous waste in containers in a unit with a containment system – applicable	40 C.F.R. § 264.178	X	X
Temporary on-site storage of remediation waste in staging piles (e.g., excavated sediments and soils)	Must be located within the contiguous property under the control of the owner/operator where the wastes are to be managed in the staging pile originated. For purposes of this section, storage includes mixing, sizing, blending or other similar physical operations so long as intended to prepare the wastes for subsequent management or treatment.	Accumulation of non-flowing hazardous remediation waste (or remediation waste otherwise subject to land disposal restrictions) as defined in 40 C.F.R. § 260.10 – applicable	40 C.F.R. § 264.554(a)(1)	X	X
Performance criteria for staging pile	Staging pile must: • Facilitate a reliable, effective and protective remedy; • Must be designed to prevent or minimize releases of hazardous wastes and constituents into the environment, and minimize or adequately control cross-media transfer as necessary to protect human health and the environment (e.g. use of liners, covers, run-off/on controls).	Storage of remediation waste in a staging pile – applicable	40 C.F.R. § 264.554(d)(1)(i) and (ii)	X	X
Operation of a staging pile	Must not operate for more than 2 years, except when an operating term extension under 40 CFR 264.554(i) is granted. Note: Must measure the 2 year limit (or other operating term specified) from first time remediation waste placed in staging pile. Must not use staging pile longer than the length of time designated by EPA in appropriate decision document.	Storage of remediation waste in a staging pile – applicable	40 C.F.R. § 264.554(d)(1)(iii) 40 C.F.R. § 264.554(h)	X	X
Design criteria for a staging pile	In setting standards and design criteria, must consider the following factors: • Length of time pile will be in operation; • Volumes of waste you intend to store in the pile; • Physical and chemical characteristics of the wastes to be stored in the unit; • Potential for releases from the unit; • Hydrogeological and other relevant environmental conditions at the facility that may influence the migration of any potential releases; and • Potential for human and environmental exposure to potential releases from the unit.	Storage of remediation waste in a staging pile – applicable	40 C.F.R. § 264.554(d)(2)(i)–(v)	X	X
Closure of staging pile of remediation waste	Must be closed within 180 days after the operating term by removing or decontaminating all remediation waste, contaminated containment system components, and structures and equipment contaminated with waste and leachate. Must decontaminate contaminated sub-soils in a manner that EPA determines will protect human health and the environment.	Storage of remediation waste in staging pile in previously contaminated area – applicable	40 C.F.R. § 264.554(i)(1) and (2)	X	X
Discharge of residual water from dewatering activities to surface water	Comply with any applicable substantive water quality requirements under the CWA including application of technology- or ambient water quality-based effluent limitations to ensure discharge does not cause or contribute to violation of water quality standards. • Technology based effluent limitations and standards based on effluent limitations and standards promulgated under Sections 301 of the [CWA], or case-by-case effluent limitations determined under Section 402(a)(1) of the [CWA] when technology based standards or new source performance standards have not been promulgated, or a combination of the two. • Other applicable effluent limitations and standards under Sections 301, 302, 303, 304, 307, 318, and 405 of the [CWA] and applicable effluent guidelines and standards under 40 C.F.R. Subchapter N.; and • Other requirements in addition to or more stringent than promulgated effluent limitations, guidelines, or standards under Sections 301, 306, 307, 318, and 405 of the Clean Water Act where necessary to achieve water quality standards established under Section 303 of the CWA and AWP/CA §2-22-9(g). • Take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of effluent standards which has the reasonable likelihood of adversely affecting human health and the environment.	Discharge of pollutants into surface waters – applicable	40 C.F.R. § 122	X	
Discharge of residual water from dewatering activities to surface water	• Properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used to achieve compliance with effluent standards. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures.	Discharge of pollutants into surface waters – applicable	40 C.F.R. § 122.44(a), (b), (d) 40 C.F.R. § 122.41(d) 40 C.F.R. § 122.41(e)	X	
Disposal of RCRA hazardous waste in an off-site land-based unit	May be land disposed if it meets the requirements in the table "Treatment Standards for Hazardous Waste" at 40 CFR 268.40 before land disposal.	Land disposal, as defined in 40 CFR 268.2, of restricted RCRA waste – applicable	40 C.F.R. § 268.40(a)	X	X
Disposal of RCRA hazardous waste in an off-site land-based unit	All underlying hazardous constituents [as defined in 40 CFR 268.2(i)] must meet the Universal Treatment Standards (UTSs), found in 40 CFR 268.48 Table UTS prior to land disposal.	Land disposal of restricted RCRA characteristic wastes (D001–D043) that are not managed in a wastewater treatment system that is regulated under the CWA, that is CWA equivalent, or that is injected into a Class I nonhazardous injection well – applicable	40 C.F.R. § 268.40(e)	X	X
Disposal of RCRA – hazardous waste soil in an off-site land-based unit	Must be treated according to the alternative treatment standards of 40 CFR 268.48(c) or according to the UTSs specified in 40 CFR 268.48 applicable to the listed and/or characteristic waste contaminating the soil prior to land disposal.	Land disposal, as defined in 40 CFR 268.2, of restricted hazardous soils – applicable	40 C.F.R. § 268.49(b)	X	X
Transportation of hazardous materials	Shall be subject to and must comply with all applicable provisions of the HMTA and HMR at 49 C.F.R. §§ 171-180 related to marking, labeling, placarding, packaging, emergency response, etc. Must comply with the generator standards of Part 262 including 40 C.F.R. §§ 262.20-23 for manifesting, Sect. 262.30 for packaging, Sect. 262.31 for labeling, Sect. 262.32 for marking, Sect. 262.33 for placarding.	Any person who, under contract with a department or agency of the federal government, transports "in commerce," or causes to be transported or shipped, a hazardous material – applicable	49 C.F.R. § 171.1(c)	X	X
Transportation of hazardous waste off-site	Except as provided in 40 C.F.R. § 261.4(d)(2), a sample of waste is not subject to any requirements of 40 C.F.R. Parts 261 through 268 or 270 provided the requirements specified in subparagraphs (i) through (iii) are complied with. Exemption does not apply if laboratory determines waste is hazardous but it no longer meets conditions in paragraph (d)(1).	Preparation and initiation of shipment of hazardous waste off-site – applicable	40 C.F.R. § 262.10(h)	X	X
Transportation of samples (i.e. contaminated soils and wastewaters)	Shall take action to reduce the risk of food loss, to minimize the impact of foods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains.	Samples of solid waste or a sample of water, soil for purpose of conducting testing to determine its characteristics or composition – applicable	40 C.F.R. § 261.4 (d)	X	X
Presence of floodplain, designated as such on a map	Shall consider alternatives to avoid, to the extent possible, adverse effects and incompatible development in the floodplain. Design or modify its action in order to minimize potential harm to or within the floodplain.	Federal actions that involve potential impacts to, or take place within, floodplains – relevant and appropriate	Executive Order 11988 – Floodplain Management	X	X
Presence of floodplain, designated as such on a map	If there is no practicable alternative to locating in or affecting the floodplain, the potential harm to the floodplain shall be minimized. The natural and beneficial values of floodplains shall be restored and preserved.	Federal actions that involve potential impacts to, or take place within, floodplains – relevant and appropriate	Executive Order 11988 Section 2 (a)(2) Floodplain Management	X	X
Presence of floodplain, designated as such on a map	Structures and facilities must be constructed in accordance with existing criteria and standards set forth under the National Flood Insurance Program (NFIP) and must include mitigation of adverse impacts wherever feasible. If newly constructed structures or facilities are to be located in a floodplain, accepted floodproofing and other flood protection measures shall be undertaken. To achieve flood protection, EPA shall, wherever practicable, elevate structures above the base flood level rather than filling land.	Construction of structures and facilities within floodplains – relevant and appropriate	40 C.F.R. Part 6, App. A, § 6(c)(1) & (2)	X	X
Presence of federally endangered or threatened species, as designated in 50 C.F.R. §§ 17.11 and 17.12 -or- critical habitat of such species listed in 50 C.F.R. § 17.95	Actions that jeopardize the existence of a listed species or results in the destruction or adverse modification of critical habitat must be avoided or reasonable and prudent mitigation measures taken.	Action that is likely to jeopardize fish, wildlife, or plant species or destroy or adversely modify critical habitat – applicable	16 U.S.C. § 1538(a)	X	X
Presence of federally endangered or threatened species, as designated in 50 C.F.R. §§ 17.11 and 17.12 -or- critical habitat of such species listed in 50 C.F.R. § 17.95	Each federal agency shall, in consultation with and with the assistance of the Secretary [of DOI], insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by DOI to be critical.	Actions authorized, funded, or carried out by any Federal agency, pursuant to 16 U.S.C. § 1536 – relevant and appropriate	16 U.S.C. § 1536(a)(2); 50 C.F.R. §§ 402.13(a), 402.14	X	X
Presence of any migratory bird, as defined by 50 C.F.R. § 10.13	It shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or egg of any such bird.	Federal actions that have, or are likely to have, a measurable negative effect on migratory bird populations – applicable	16 U.S.C. § 703(a)	X	X
Presence of wetlands	Shall take action to minimize the destruction, loss or degradation of wetlands and to preserve and enhance beneficial values of wetlands. Shall avoid undertaking construction located in wetlands unless: (1) there is no practicable alternative to such construction, and (2) that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.	Federal actions that involve potential impacts to, or take place within, wetlands – TBC	Executive Order 11990 – Protection of Wetlands Section 1.(a) Section 2.(a)	X	X
Location encompassing aquatic ecosystem as defined in 40 C.F.R. § 230.3(c)	No discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.	Action that involves discharge of dredged or fill material into waters of the United States, including wetlands – relevant and appropriate	40 C.F.R. § 230.10(a)	X	
Location encompassing aquatic ecosystem as defined in 40 C.F.R. § 230.3(c)	No discharge of dredged or fill material shall be permitted if it: • Causes or contributes, after consideration of disposal site dilution and dispersion, to violations of any applicable State water quality standard; • Violates any applicable toxic effluent standard or prohibition under Section 307 of the CWA; • Jeopardizes the continued existence of species listed as endangered or threatened under the Endangered Species Act of 1973, or results in the likelihood of the destruction or adverse modification of critical habitat; • Violates any requirement imposed by the Secretary of Commerce to protect any marine sanctuary designated under title III of the Marine Protection, Research, and Sanctuaries Act of 1972. No discharge of dredged or fill material shall be permitted which will cause or contribute to significant degradation of the waters of the U.S. No discharge of dredged or fill material shall be permitted unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem.	Action that involves discharge of dredged or fill material into waters of the United States, including wetlands – relevant and appropriate	40 C.F.R. § 230.10(b) 40 C.F.R. § 230.10(c) 40 C.F.R. § 230.10(d)	X	

Table 4. Federal and State Action-Specific Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considereds (TBCs)

Area 4 Removal Work Plan

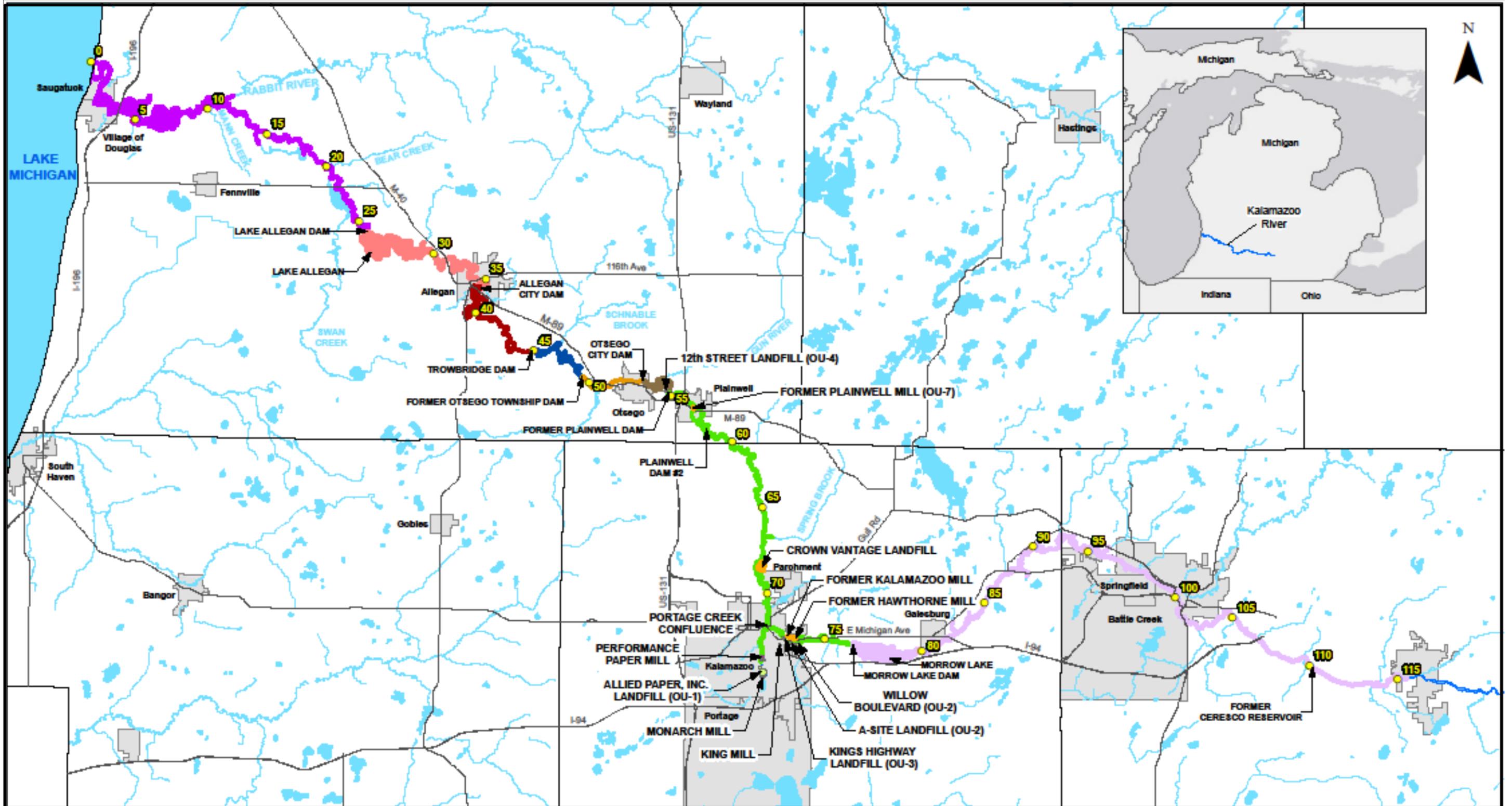
Area 4 TCRA, OU5 Area 4 TCRA Allied Paper Inc./Portage Creek/Kalamazoo River Superfund Site

Action	Requirements	Prerequisite	Citation	Applicable to Sediment/Soil	
				Sediment	Soil
Presence of any stream or other body of water proposed to be impounded, diverted, controlled, or modified for drainage	Whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatever, including navigation and drainage, by any department or agency of the United States, or by any public or private agency under Federal permit or license, such department or agency first shall consult with the United States Fish and Wildlife Service, Department of the Interior, and with the head of the agency exercising administration over the wildlife resources of the particular State wherein the impoundment, diversion, or other control facility is to be constructed, with a view to the conservation of wildlife resources by preventing loss of and damage to such resources as well as providing for the development and improvement thereof in connection with such water-resource development.	Federal actions that propose to impound, divert, control, or modify waters of any stream or body of water - relevant and appropriate	16 U.S.C. § 662(a)	X	
Water quality-based limits for discharge into navigable waters	Establishes effluent standards in accordance with federal WPCA and CWA. Applicable for alternatives involving discharge of water to the river.	Wastes generated from remedial process to be discharged to river would be subject to the substantive requirements of Part 31 of the NREPA, MCL 324.3101 et seq., and Mich Admin Code R. 323.1201-1221; and R. 323.2101-2195 - relevant and appropriate	Michigan NREPA, MCL 324.1301 et seq, Mich Admin Code R 323.1201-1221; R 323.2101-2195	X	X
Water quality-based limits for discharge to groundwater or the ground	Establishes requirements for discharges of waters or waste to groundwater or to the ground.	Substantive requirements would apply if remedial alternatives involve discharges of wastewater or wastes to groundwater or to the ground - relevant and appropriate	Mich Admin Code R 323.2201-2240 (Part 22 Rules for groundwater protection)	X	X
Transportation, storage, and disposal of hazardous waste off-site	Establishes requirements for hazardous waste generators, transporters, and treatment/storage/disposal (TSD) facilities. Area 4 is likely not a TSD facility nor a generator of hazardous wastes, although certain portions of the regulations may be useful as a means of determining handling/transportation requirements.	Hazardous wastes generated from remedial process to be transported, stored, and/or disposed of off-site as defined in MCL324.11101-11153 - relevant and appropriate	Michigan NREPA, MCL 324.11101-11153	X	X
Disposal of non-hazardous waste off-site	Establishes rules for solid waste disposal facilities. Applies to a remedial alternative involving landfilling.	Non-hazardous wastes generated from remedial process to be transported and disposed of off-site as defined in MCL 324.11101-11153 and Mich Admin Code R. 299.4401 - 4922 - relevant and appropriate	Michigan NREPA, MCL 324.11101-11153 and Mich Admin Code R 299.4401 - 4922	X	X
Regulation of activities in inland lakes or streams to complete remedial actions	Regulates dredging or filling of lake or stream bottoms and establishes mitigation requirements. For certain remedial alternatives, activities may be affected by these regulations.	Dredging or filling will be included in remedial activities as defined in MCL 324.30101 - 30113 - applicable	Michigan NREPA, Part 301 (Inland Lakes and Streams), MCL 324.30101 - 30113; Mich Admin Code R 281.811-845	X	X
Use of dredging or filling in wetlands to complete remedial activities	Establishes the rules regarding wetland uses and the permit application process for protection of state wetland areas. For certain remedial alternatives, activities may be affected by these rules.	Dredging or filling in regulated wetlands may be included, in remedial activities as defined in MCL 324.30101 - 30113 - relevant and appropriate	Michigan NREPA, Part 303 (Wetlands Protection), MCL 324.30101-30329; Mich Admin Code R 281.921-925; R 281.951-961	X	X
Maintaining safe conditions during remedial activities	Establishes the rules for safety standards in the workplace. For certain remedial alternatives, activities may be restricted by these regulations.	Safety standards used during remedial activities as detailed in MCL 408.1001 - 1094 - applicable	Michigan NREPA, MCL 408.1001-1094; portions of the MIOSHA rules including Part 4 through 13 of the All Industry Administrative Rules, Parts 1-91 of Construction Safety Standards Commission Rules, Part 1-93 of the General Industry Safety Standards Commission Rules, and Parts 301-681 of the Occupational Health Standards Commission Rules.	X	X
Human health and wildlife risk-based limits for air emissions	Establishes rules prohibiting the emission of air contaminants in quantities that cause injurious effects to human health, animal life, plant life of significant economic value, and/or property. For certain remedial alternatives, dust emissions may need to be monitored and controlled, if appropriate.	Air emissions may be generated that create threats to human health as defined in MCL 324.5501 - 5542 and Mich Admin Code R. 336.1101-2823 - relevant and appropriate	Michigan NREPA, MCL 324.5501-5542; Mich Admin Code R 336.1101-2823	X	X
Soil erosion and sediment control requirements for owners of land undergoing an earth change	Establishes rules prescribing soil erosion and sedimentation control plans, procedures, and measures	For any remedial action involving an earth change, substantive requirements of permit must be satisfied - relevant and appropriate	Michigan NREPA, Part 91 (Soil Erosion and Sediment Control), MCL 324.9101- 9112; Mich Admin Code R 323.1701-1714	X	X
Dam Safety	Provides requirements for dam construction and maintenance to ensure that dams are properly constructed, inspected, and maintained, and that the owners have adequately prepared for potential emergencies. Permits are required for the construction, enlargement, repair, alteration, removal, abandonment, and reconstruction of state regulated dams. Dam removal will also have an impact on water resources, so there will also be applicable rules in Part 31.	Applies to dams over 6' in height and over 5 acres of impoundment during the design flood. Would apply to remedial actions that impact regulated dams and surrounding areas - relevant and appropriate	Michigan NREPA, Part 315 (Dam Safety), MCL 324.31501-31529; Part 31 (Water Resources), MCL 324.3101	X	X
Invasive Species	Lists nonnative species that are prohibited or restricted in Michigan; provides authority and procedures for State Natural Resources Commission to add or delete from the list. Provides for a permit for introduction of genetically engineered organisms. Provides penalties for violations.	Substantive requirements apply to remedial alternatives that involve restoration or planting activities - relevant and appropriate	Michigan NREPA, Part 413 (Transgenic and Nonnative Organisms), MCL 324.41301-41325	X	X
Storage and handling of liquid industrial wastes	Imposes requirements on generators for storage, documentation, and handling for on-site liquid waste in preparation for transport, for the use of registered haulers, and for the inspection of vehicles and control of the disposal of wastes.	Remedial actions may require transportation and disposal of liquid waste, and the Part 121 requirements apply to the storage and transport of those wastes - relevant and appropriate	Michigan NREPA, Part 121 (Liquid Industrial Waste), MCL 324.12101-12118	X	X
Reporting wastewater discharge	Requires discharge reporting on the part of any wastewater discharger other than of sanitary sewage to a sewer system. Applicable to any alternatives involving discharge of wastewater.	Remedial activities include discharge of wastewater as defined Mich Admin Code R. 299.9007 - relevant and applicable	Michigan NREPA; Mich Admin Code R 299.9007	X	X
Human health and wildlife risk-based limits for air emissions	Establishes rules prohibiting the emission of air contaminants in quantities that cause injurious effects to human health, animal life, plant life of significant economic value, and/or property. For certain remedial alternatives, dust emissions may need to be monitored.	Air emissions are generated that create threats to human health as defined in MCL 336.1101 - 2823 and MCL 324.5501 - 5542 - relevant and appropriate	Michigan NREPA; MCL 336.1101 - 2823; MCL 324.5501 - 5542	X	X

Notes:
1 These ARARs have been identified by EGLE in May 2020.
EGLE - Michigan Department of Environmental Quality

Figures

- Fig. 1 Kalamazoo River Superfund Site Location Map
- Fig. 2 OU5 Area 4 Subarea Layout
- Fig. 3 Area 4 TCRA Project Schedule
- Fig. 4 Project Organization Chart
- Fig. 5 PCB Dredge Areas
- Fig. 6 Bank and Stream Tube Turbidity Screen and Steel Sheet Pile Wall Locations
- Fig. 7 Area 4 Proposed Access Roads



LEGEND:

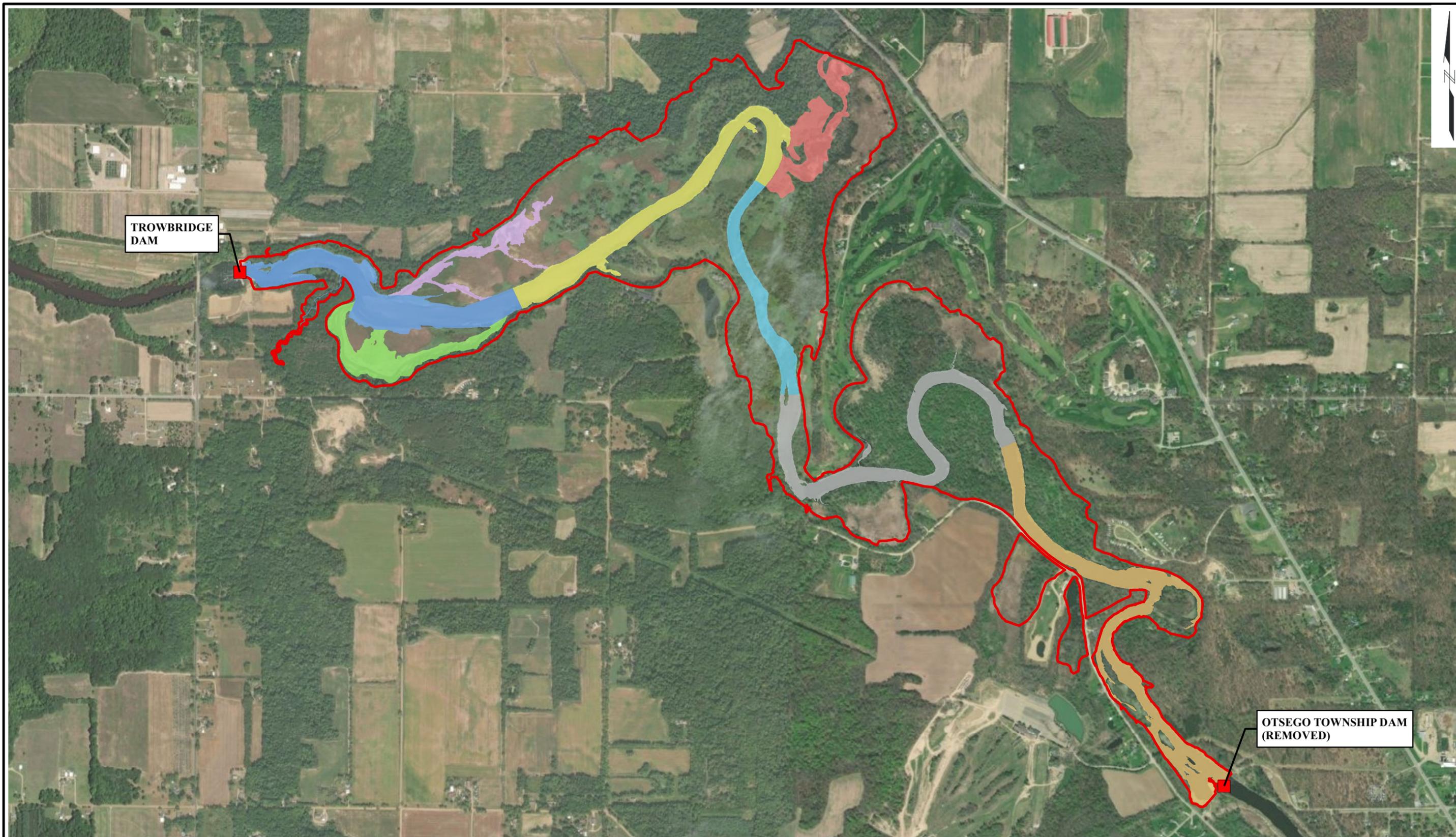
- RIVER MILE MARKER
- ROAD
- KALAMAZOO RIVER/PORTAGE CREEK
- WATER BODIES
- INCORPORATED AREA
- COUNTY BOUNDARY
- AREA 1
- AREA 2
- AREA 3
- AREA 4
- AREA 5
- AREA 6
- AREA 7
- REFERENCE AREA

OU5 Allied Paper/Portage Creek/Kalamazoo River Superfund Site
 Area 4 TCRA - Allegan County, Michigan
 Kalamazoo River Areas 2, 3, and 4 Remediation LLC



KALAMAZOO RIVER SUPERFUND SITE LOCATION MAP
 Project 2000273
 September 2023
 Fig. 1

Prepared by AG (09/20/2023)
 Checked by PJ (09/20/2023)



LEGEND:

Area 4 Boundary	Subarea C	Subarea F
Subarea A	Subarea D	Subarea G
Subarea B	Subarea E	Subarea H



Prepared by AG (09/20/2023)
Checked by PJ (09/20/2023)

OU5 Allied Paper/Portage Creek/Kalamazoo River
Superfund Site
Area 4 TCRA - Allegan County, Michigan
Kalamazoo River Areas 2, 3, and 4 Remediation LLC



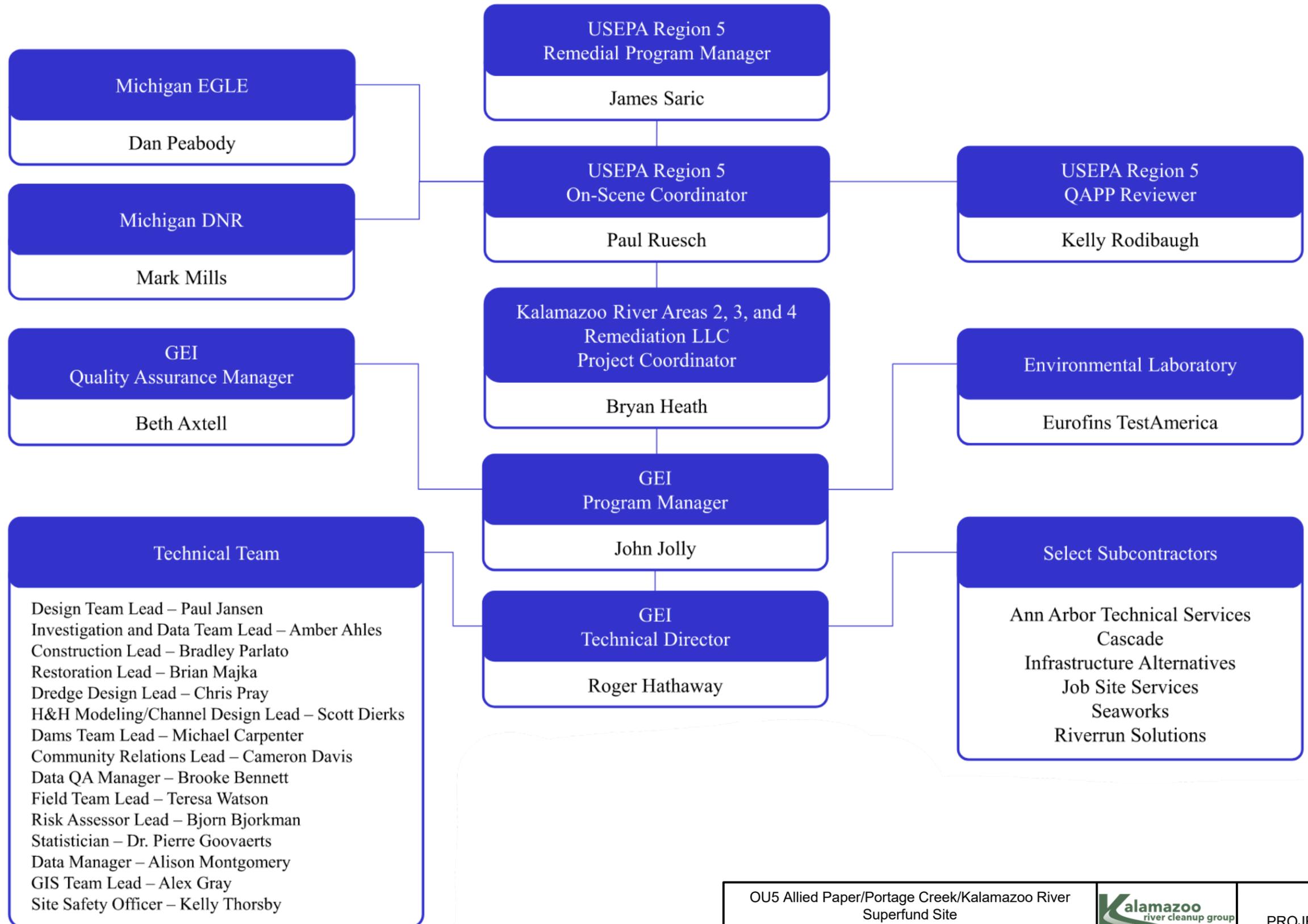
OU5 AREA 4
SUBAREA LAYOUT
Project 2000273
September 2023
Fig. 2

Figure 3. Area 4 TCRA Schedule		Start Date	Finish Date
Work Plans			
	Field Sampling Plan	14-Feb-20	15-May-20
	Supplemental Field Sampling Plans	7-Sep-20	11-Sep-23
	Removal Action Work Plan	1-Apr-20	23-Oct-20
	Area 4 Design Work Plans	1-Aug-20	15-Dec-21
	Programmatic/Investigation Work Plan Revisions	15-May-20	5-Jan-22
	Revise Removal Work Plan Part 1	4-Aug-23	4-Oct-23
	EPA Approval of Removal Work Plan Part 1		1-Nov-23
Preliminary Investigation			
	PDI Procurement & Permitting	4-Apr-20	23-Oct-20
	Sediment and Soil Sampling Phase 1	17-Jun-20	23-Oct-20
	Lab Analysis Phase 1	22-Jun-20	7-Dec-20
	Data Validation Phase 1	6-Jul-20	12-Dec-20
	Water Monitoring (velocity, turbidity, level)	10-Jul-20	27-Nov-25
	Geotechnical Sampling and Analysis	26-Oct-20	7-Jan-21
	Ecological Activity (bat tree, mussel survey, etc.)	1-Jun-20	31-Oct-21
	Area 4 PDI Phase 1 Data transmittal	7-Jan-21	8-Jan-21
	PDI Fieldwork 2021 (Phase 2)	3-May-21	13-Jul-21
	PDI Fieldwork 2022 (Phase 3)	1-Jun-22	15-Aug-22
Design			
	Trowbridge Site Preparation Design & Bid	6-Apr-20	1-Apr-21
	30% TCRA Removal Design Submittal	16-Apr-20	11-May-21
	60% TCRA Removal Design Submittal	7-May-21	8-Nov-21
	Revised TCRA Removal Design Submittal	8-Nov-21	15-Aug-22
	Update Design Drawings to Reflect Part 1 Scope		27-Oct-23
Construction			
	Area 4 Trowbridge Staging Area Clearing and Grading	16-Aug-21	27-Aug-21
	TCRA Part 1 Bid Package Release		15-Nov-23
	Access and Haul Road Stages 1 and 2	15-Jul-22	30-Nov-23
	Part 1 Initial Field Activities Begin (to be determined with EPA)	1-Feb-24	
	General Contractor Selection		1-Mar-24
	Submit to EPA a Detailed Construction Schedule with Contractor Input		15-Apr-24
	TCRA Part 1 Notice to Proceed to General Contractor		15-May-24
	Start Dredging (subject to contractor input)	15-Sep-24	

Note: Schedule is subject to change with contractor input. Changes will be reported in monthly progress reports.

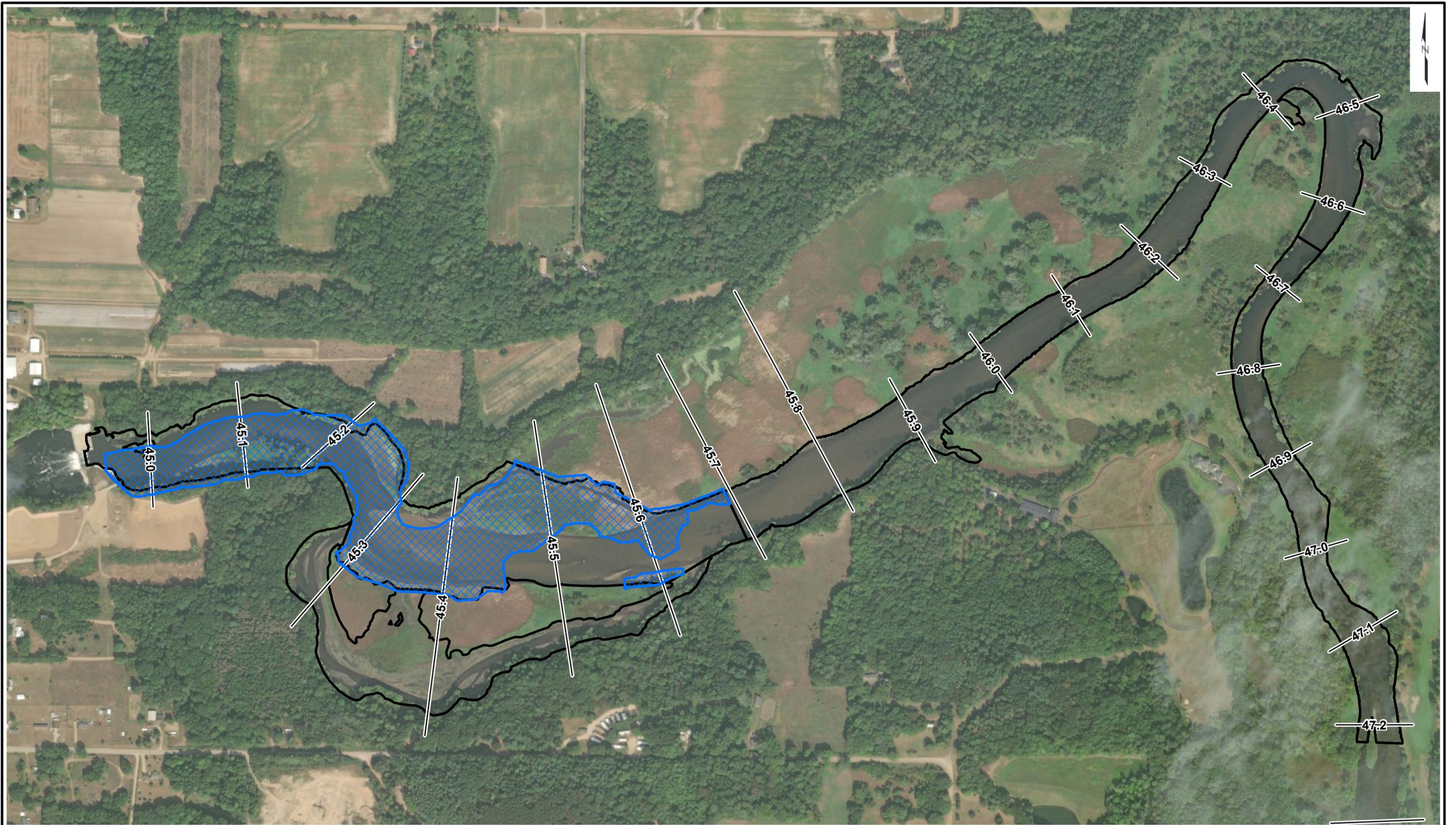
created by BA 9-28-23

checked by RH 9-28-23



Prepared by LL (09/12/2023)
Checked by BA (09/12/2023)

OU5 Allied Paper/Portage Creek/Kalamazoo River Superfund Site Area 4 TCRA – Allegan County, Michigan		PROJECT ORGANIZATION CHART
Kalamazoo River Areas 2, 3, and 4 Remediation LLC	Project 2000273	September 2023 Fig. 4



LEGEND:

- 1/10th Mile Marker
- Approximate Dredge Area
- Subarea Boundary



Prepared by AG (09/12/2023)
Checked by PJ (09/12/2023)

OU5 Allied Paper/Portage Creek/Kalamazoo River
Superfund Site
Area 4 TCRA - Allegan County, Michigan

Kalamazoo River Areas 2, 3, and 4 Remediation LLC

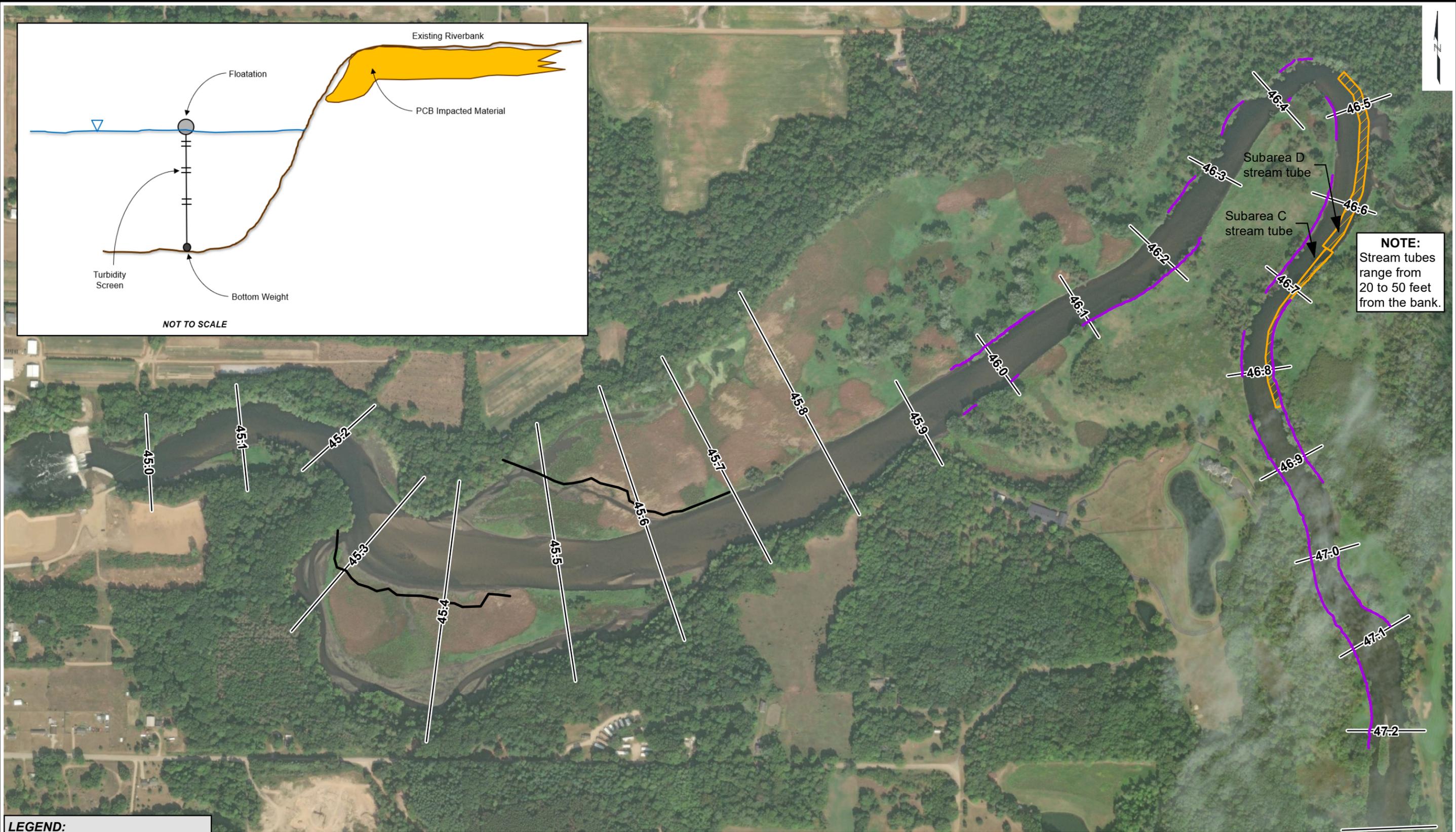
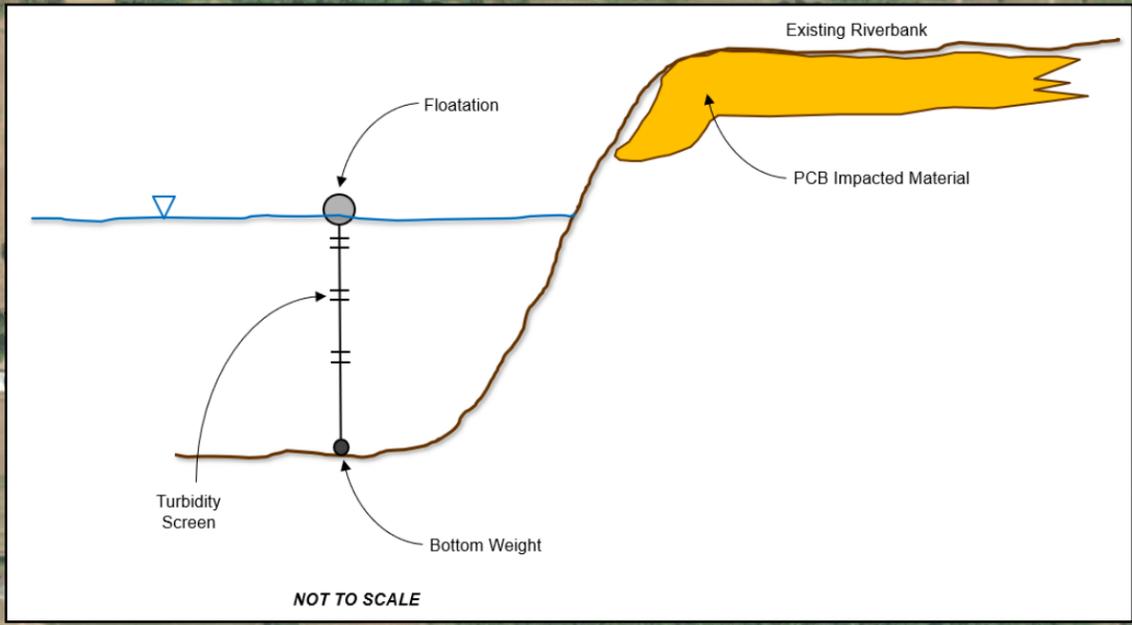


Project 2000273

DREDGE AREAS

September 2023

Fig. 5



NOTE:
Stream tubes range from 20 to 50 feet from the bank.

LEGEND:

	Stream tube
	Steel sheet pile wall
	Approximate turbidity screen location
	1/10th Mile Marker
	Subarea Boundary

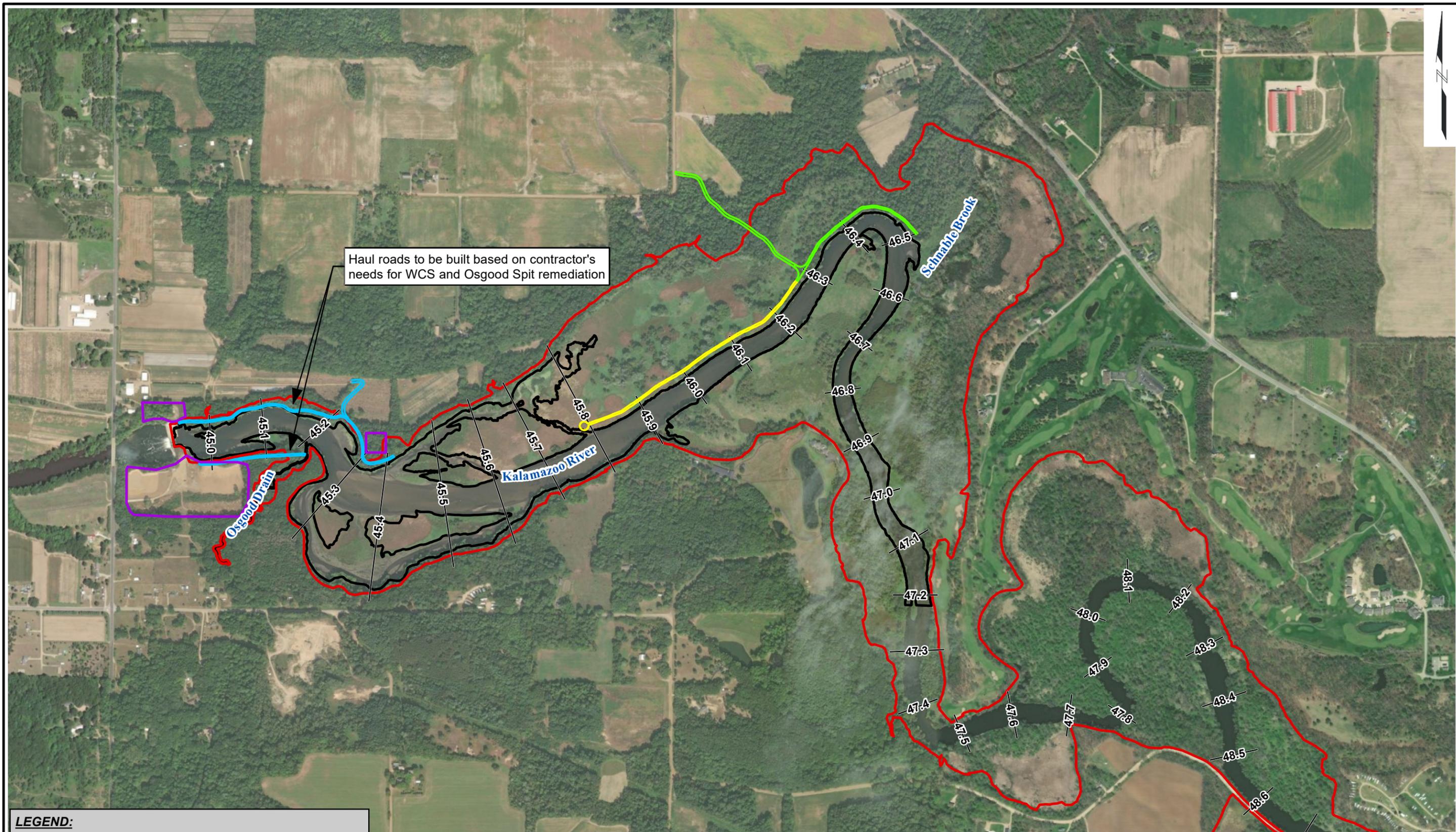


OU5 Allied Paper/Portage Creek/Kalamazoo River Superfund Site
Area 4 TCRA - Allegan County, Michigan
Kalamazoo River Areas 2, 3, and 4 Remediation LLC



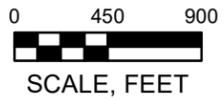
BANK AND STREAM TUBE TURBIDITY SCREEN AND STEEL SHEET PILE WALL LOCATIONS
Project 2000273
September 2023
Fig. 6

Prepared by AG (09/28/2023)
Checked by PJ (09/28/2023)



LEGEND:

	Area 4 Boundary		Proposed Staging Area
	Area 4 TCRA Boundary		Installed 2022
			To Be Installed Fall 2023
			Proposed Haul/Access Road



Prepared by AG (09/20/2023)
Checked by PJ (09/20/2023)

OU5 Allied Paper/Portage Creek/Kalamazoo River
Superfund Site
Area 4 TCRA - Allegan County, Michigan
Kalamazoo River Areas 2, 3, and 4 Remediation LLC



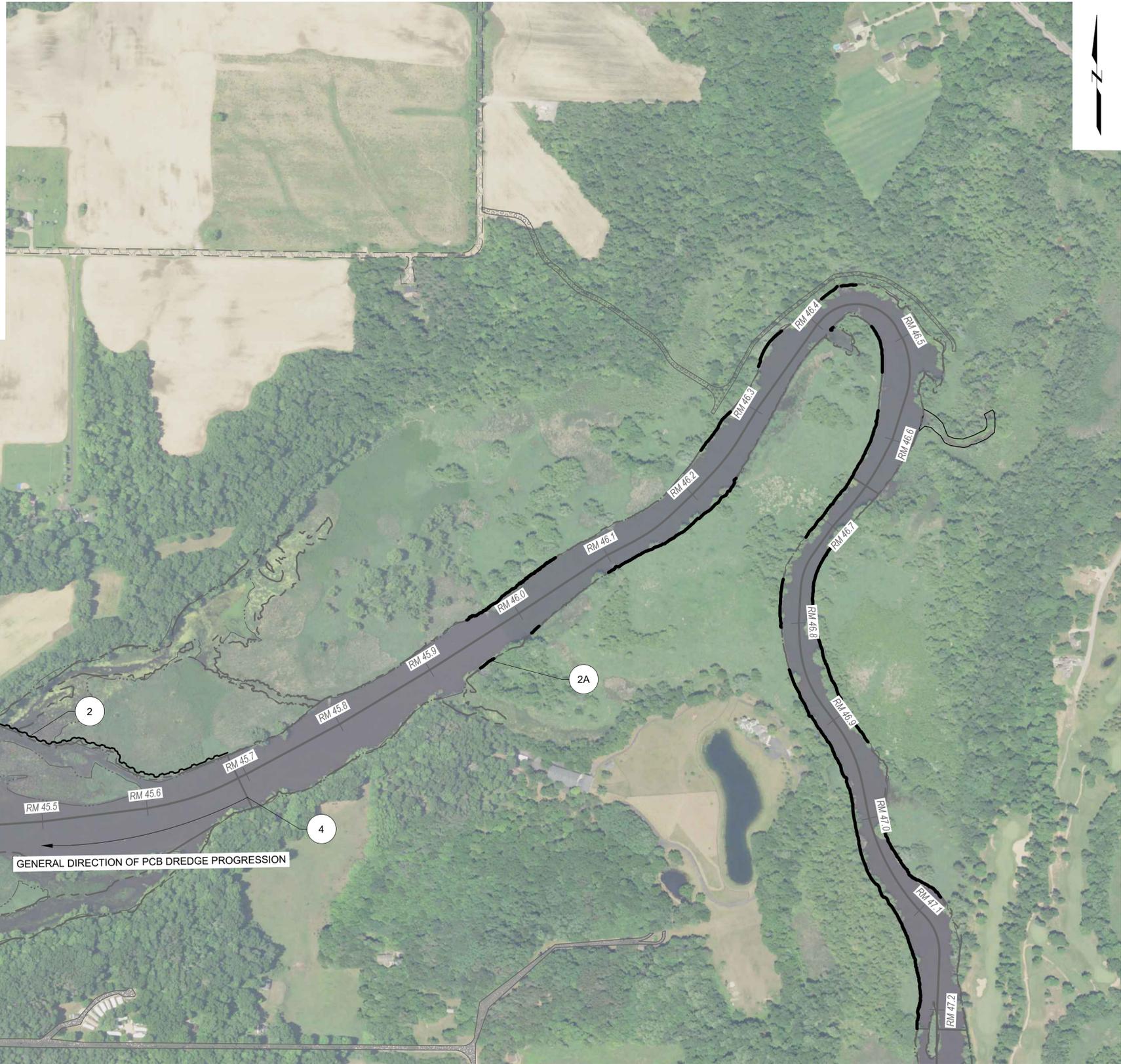
AREA 4
PROPOSED ACCESS ROADS
Project 2000273
September 2023
Fig. 7

Appendix A: General Sequence of Work

General work sequence drawings for Part 1 TCRA. Actual sequence will be determined with contractor input based on their means and methods.

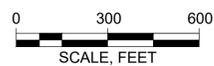
GENERAL SEQUENCE OF WORK

STAGE	DESCRIPTION
1	INSTALL TURBIDITY CONTROLS AND CONSTRUCT DREDGE STAGING AREA.
2	INSTALL STEEL SHEET PILE WALLS IN SUBAREA E AT SUBAREA F AND G BOUNDARY AT LOCATIONS SHOWN TO FACILITATE SEDIMENT REMOVAL.
2A	INSTALL TEMPORARY BANK STABILIZATION CONTROLS.
3	REMOVE ≥50 MG/KG PCB IMPACTED SEDIMENTS, WITH THE EXCEPTION OF THE OSGOOD SPIT AREA, FROM UPSTREAM TO DOWNSTREAM STARTING FROM SUBAREAS E AND D BOUNDARY.
4	DREDGE PCB IMPACTED SEDIMENTS FROM UPSTREAM TO DOWNSTREAM STARTING FROM SUBAREAS E AND D BOUNDARY.
5	DREDGE/EXCAVATE AND STOCKPILE CLEAN SOILS/SEDIMENT FROM BEAVER ISLAND AND SURROUNDING AREA (NOTE, THIS IS STEP 3 ON SHEET TD-10).
6	INSTALL STEEL SHEET PILE WALL TO ISOLATE OSGOOD SPIT AREA.
7	DREDGE PCB-IMPACTED SEDIMENTS IN THE CHANNEL IN LOWER SUBAREA E.
8	DREDGE PCB-IMPACTED SEDIMENTS AND ≥50 MG/KG MATERIAL FROM OSGOOD SPIT.
9	COMPLETE INSTALLATION OF THE WCS (SEE SHEET TD-10 FOR DAM REMOVAL SEQUENCE STEPS).



WORK SEQUENCE NOTES:

1. WORK SEQUENCE SHOWN IS GENERAL IN NATURE. ACTUAL SEQUENCE OF WORK IS TO BE DETERMINED BY THE CONTRACTOR BASED ON THEIR SELECTED MEANS AND METHODS SUBJECT TO REVIEW AND ACCEPTANCE BY THE ENGINEER PRIOR TO IMPLEMENTATION.



Attention:			
<p>If this scale bar does not measure 1" then drawing is not original scale.</p>			
No.	DATE	ISSUE/REVISION	APP



Designed: CRP 9-12-2023
 Checked: PCJ 9-12-2023
 Drawn: GLS 9-12-2023
 Approved by: CRP 9-12-2023

Kalamazoo River Areas 2, 3, and 4 Remediation LLC

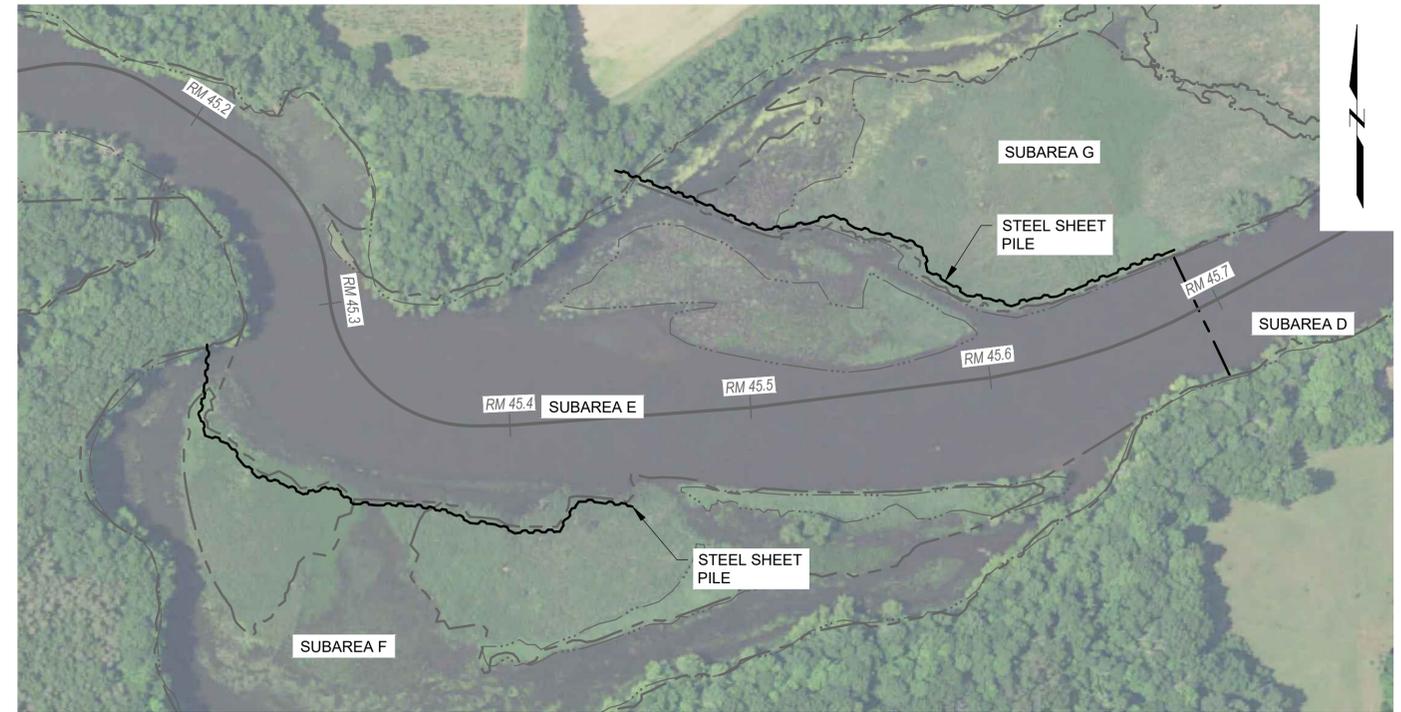
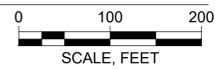
GEI Project 2000273

FOR BIDDING PURPOSES ONLY

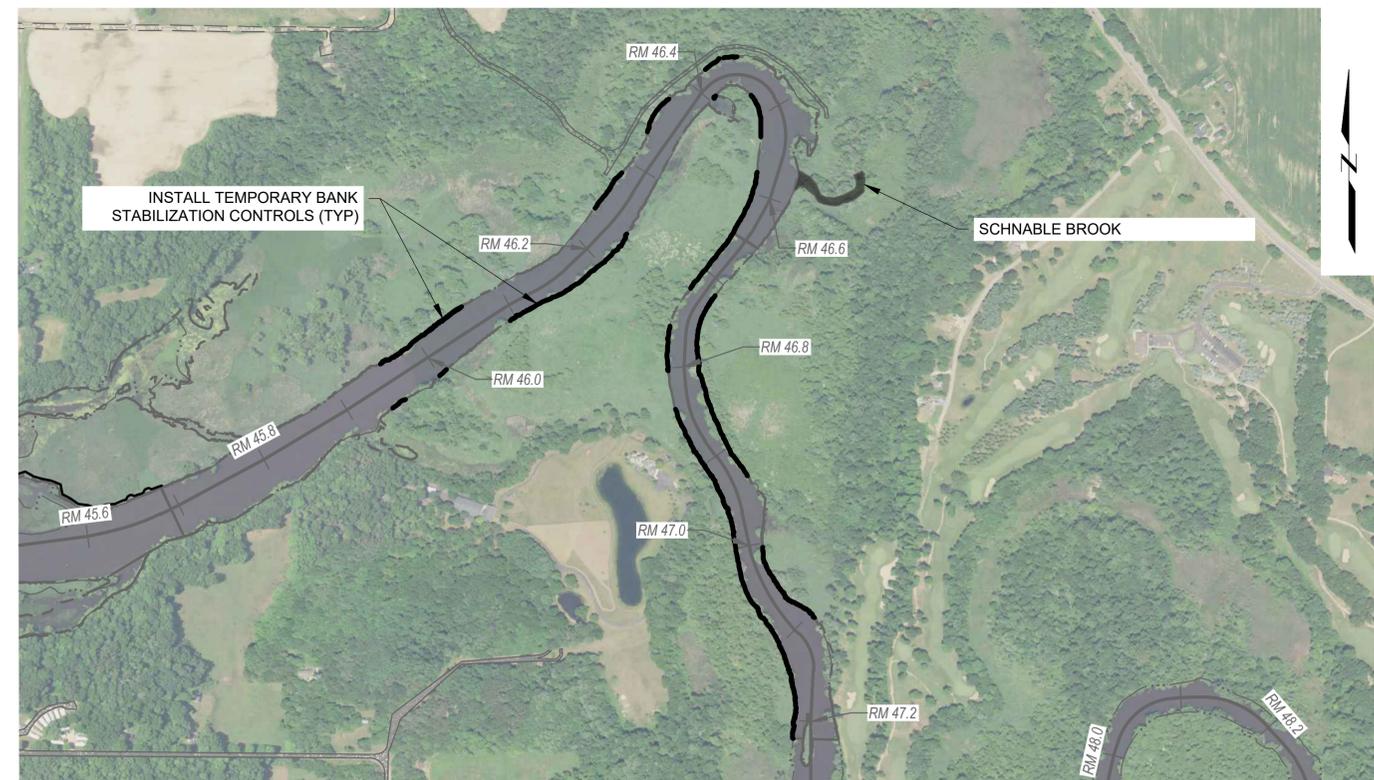
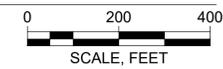
OU5 Allied Paper/Portage Creek/Kalamazoo River Superfund Site Area 4 TCRA - Allegan County, Michigan	DWG. NO. GE-007
WORK SEQUENCE PLAN SHEET 1 OF 4	SHEET NO.



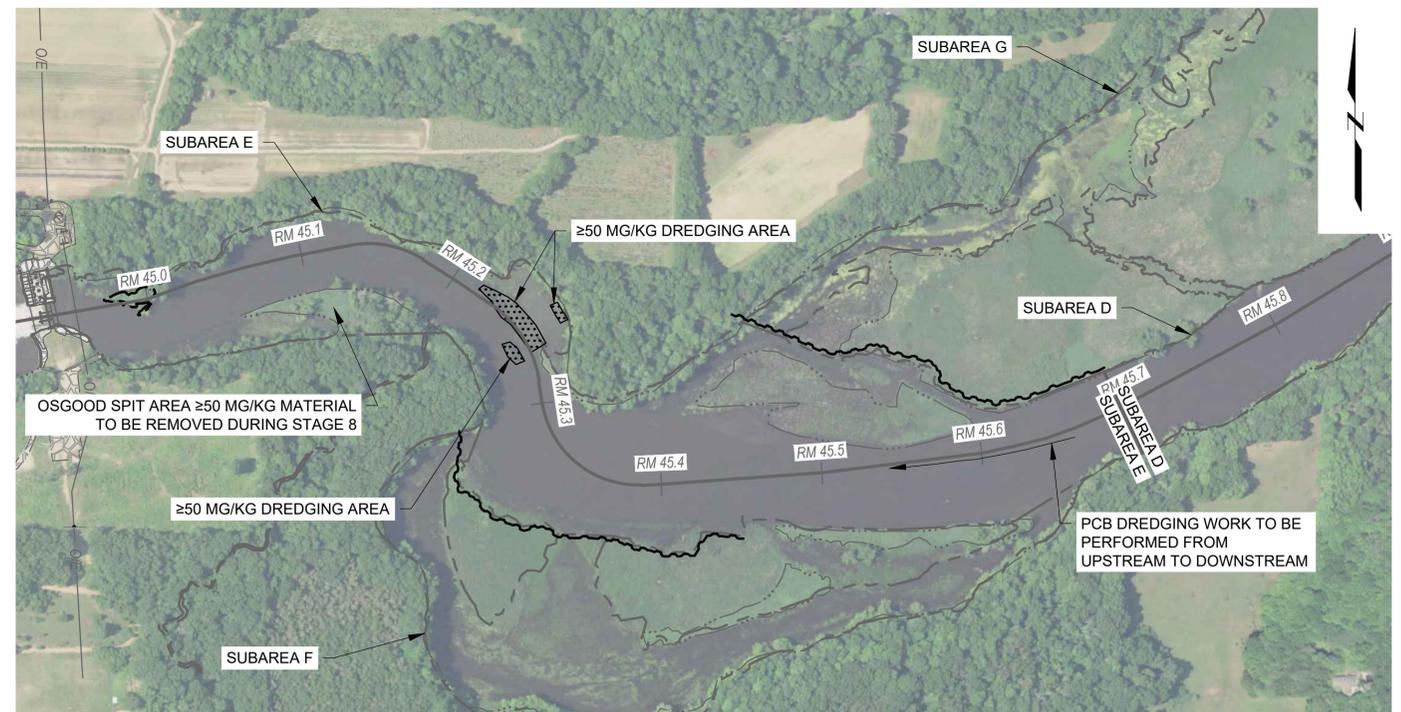
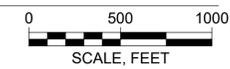
1 STAGE
- INSTALL TURBIDITY CONTROLS



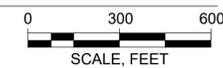
2 STAGE
- INSTALL STEEL SHEET PILE WALLS IN SUBAREA E AT SUBAREA F AND G BOUNDARY AT LOCATIONS SHOWN TO FACILITATE SEDIMENT REMOVAL



2A STAGE
- INSTALL TEMPORARY BANK STABILIZATION CONTROLS



3 STAGE
- REMOVE ≥50 MG/KG PCB IMPACTED SEDIMENTS, WITH THE EXCEPTION OF THE OSGOOD SPIT AREA, FROM UPSTREAM TO DOWNSTREAM STARTING FROM SUBAREAS E AND D BOUNDARY



FOR BIDDING PURPOSES ONLY

Attention:			
<p>If this scale bar does not measure 1" then drawing is not original scale.</p>			
No.	DATE	ISSUE/REVISION	APP



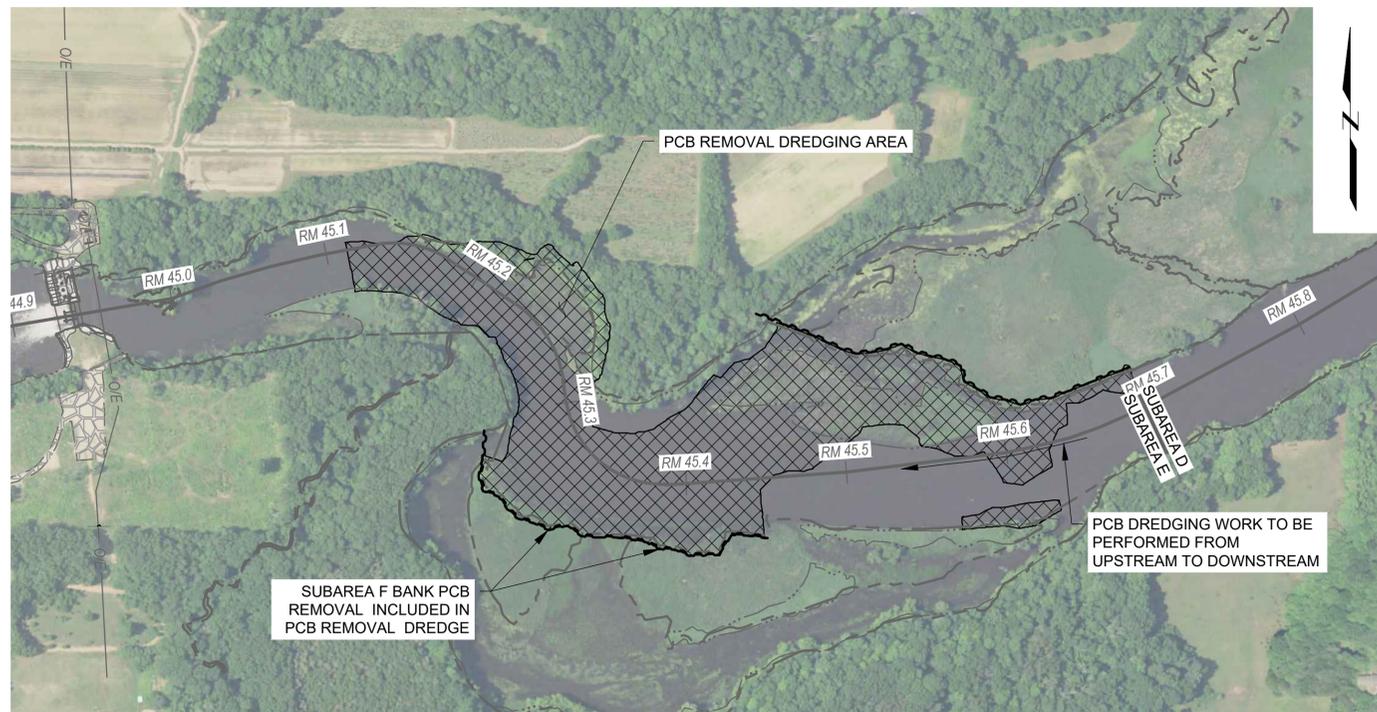
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Checked: PCJ 9-12-2023
Drawn: GLS 9-12-2023
Approved by: CRP 9-12-2023



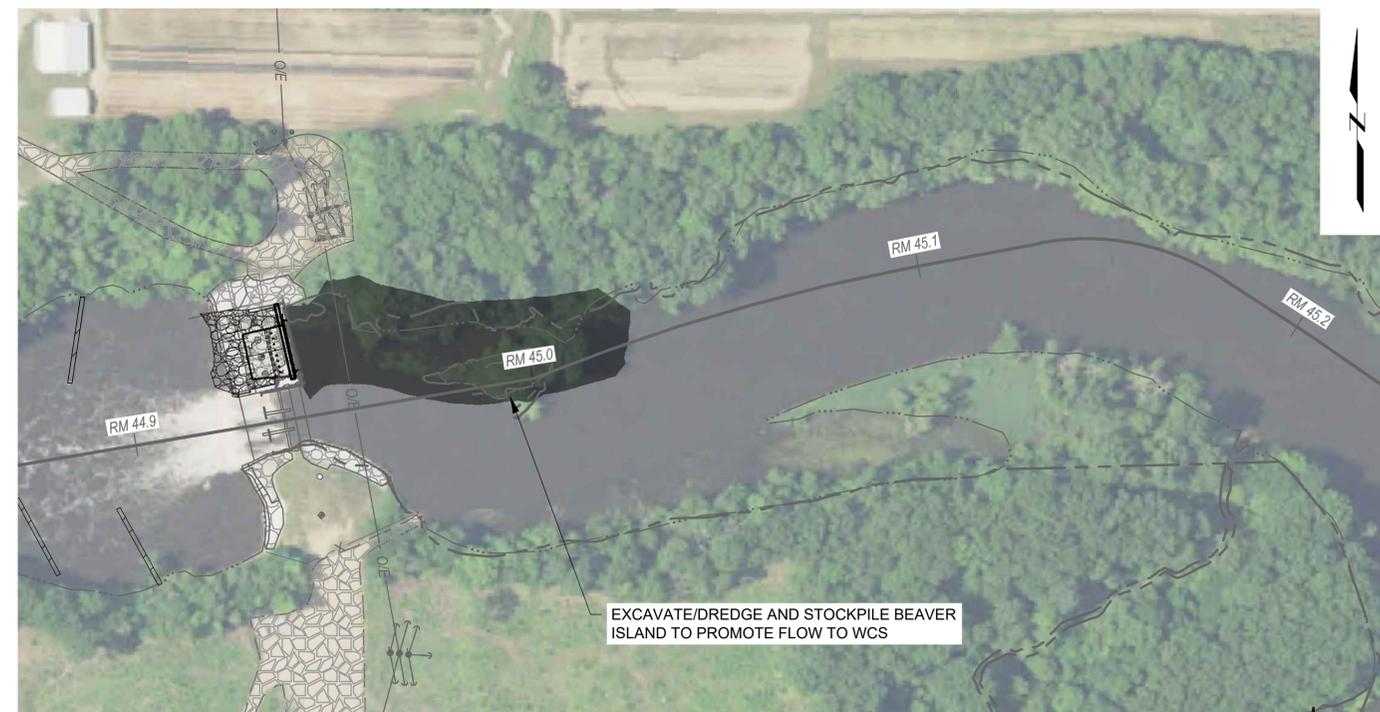
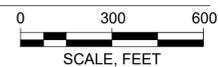
OU5 Allied Paper/Portage Creek/Kalamazoo River Superfund Site
Area 4 TCRA - Allegan County, Michigan

WORK SEQUENCE PLAN
SHEET 2 OF 4

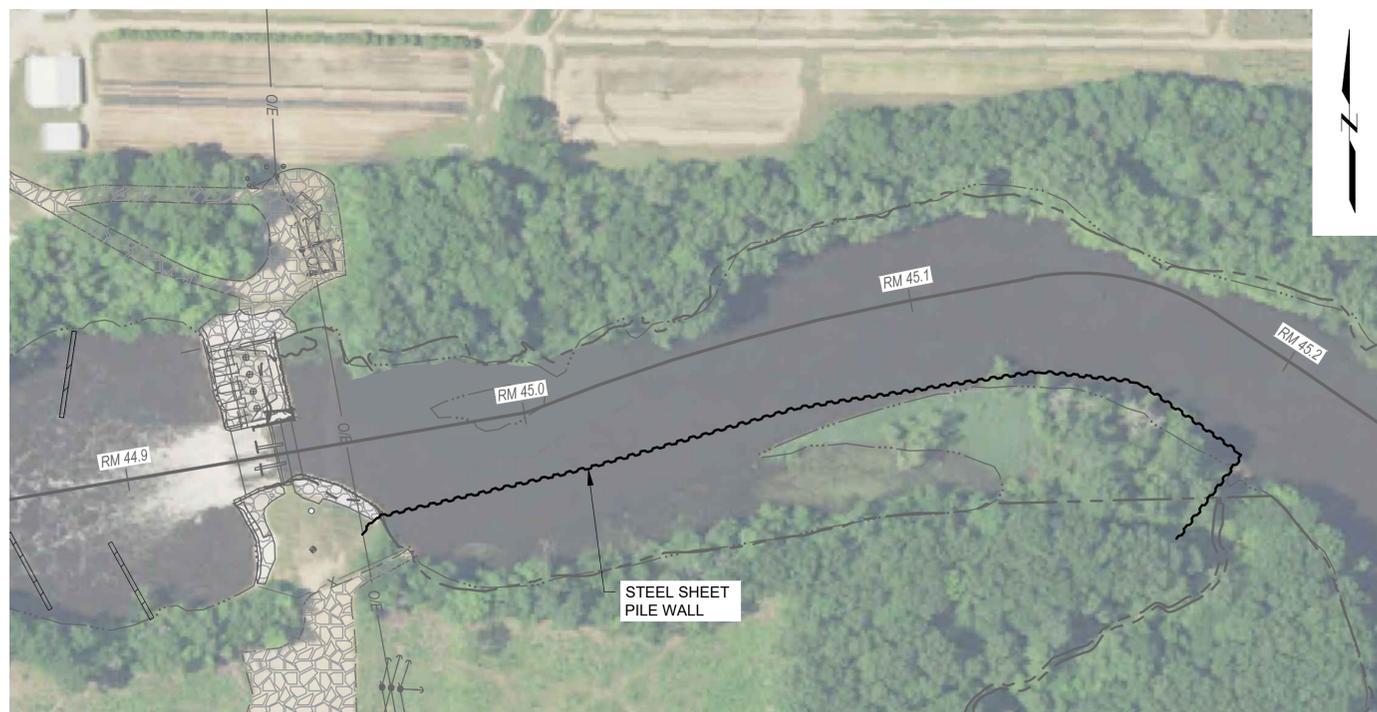
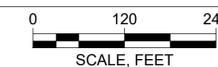
DWG. NO.
GE-008
SHEET NO.



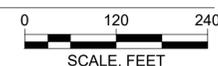
4 STAGE
 - DREDGE PCB IMPACTED SEDIMENTS FROM UPSTREAM TO DOWNSTREAM STARTING FROM SUBAREAS E AND D BOUNDARY



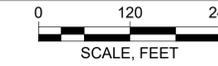
5 STAGE
 - DREDGE/EXCAVATE AND STOCKPILE CLEAN SOILS/SEDIMENT FROM BEAVER ISLAND AND SURROUNDING AREA (NOTE, THIS IS STEP 3 ON SHEET TD-10).



6 STAGE
 - INSTALL STEEL SHEET PILE WALL TO ISOLATE OSGOOD SPIT AREA



7 STAGE
 - DREDGE PCB IMPACTED SEDIMENTS IN THE CHANNEL IN LOWER SUBAREA E



FOR BIDDING PURPOSES ONLY

Attention:			
<p>If this scale bar does not measure 1" then drawing is not original scale.</p>			
No.	DATE	ISSUE/REVISION	APP



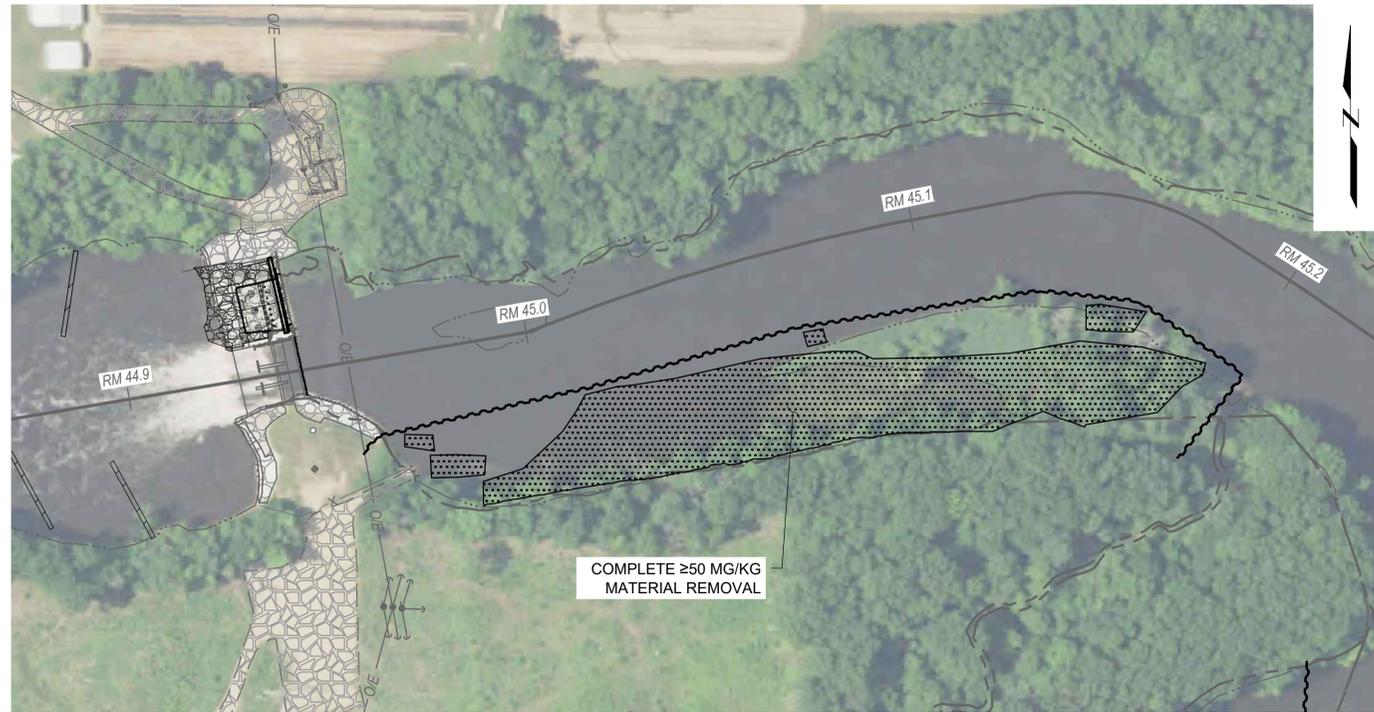
Designed: CRP 9-12-2023
 Checked: PCJ 9-12-2023
 Drawn: GLS 9-12-2023
 Approved by: CRP 9-12-2023



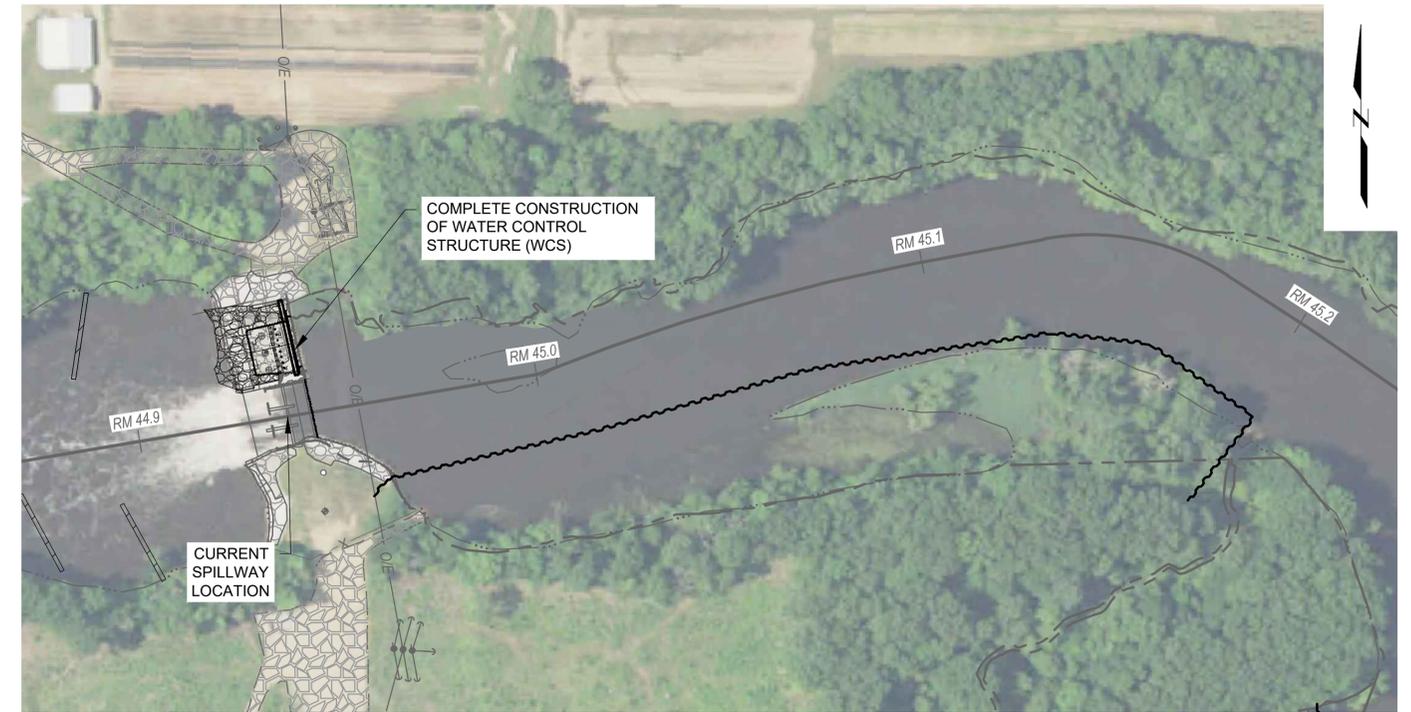
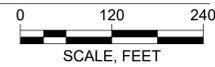
OU5 Allied Paper/Portage Creek/Kalamazoo River Superfund Site
 Area 4 TCRA - Allegan County, Michigan

WORK SEQUENCE PLAN
 SHEET 3 OF 4

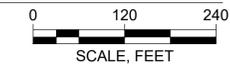
DWG. NO.
 GE-009
 SHEET NO.



8 STAGE
 - DREDGE PCB IMPACTED SEDIMENTS AND ≥ 50 MG/KG MATERIAL FROM OSGOOD SPIT



9 STAGE
 - COMPLETE INSTALLATION OF THE WCS (SEE SHEET TD-10 FOR DAM REMOVAL SEQUENCE STEPS).



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Attention: 0 1" If this scale bar does not measure 1" then drawing is not original scale.				
	No.	DATE	ISSUE/REVISION	APP

 GEI CONSULTANTS OF MICHIGAN, P.C. 3065 AKERS MILL ROAD, SUITE 235 ATLANTA, GEORGIA 30339	Designed:	CRP 9-12-2023
	Checked:	PCJ 9-12-2023
	Drawn:	GLS 9-12-2023
	Approved by:	CRP 9-12-2023

Kalamazoo River Areas 2, 3, and 4 Remediation LLC

AREAS 2, 3 AND 4 TCRA

GEI Project 2000273

OU5 Allied Paper/Portage Creek/Kalamazoo River Superfund Site
 Area 4 TCRA - Allegan County, Michigan

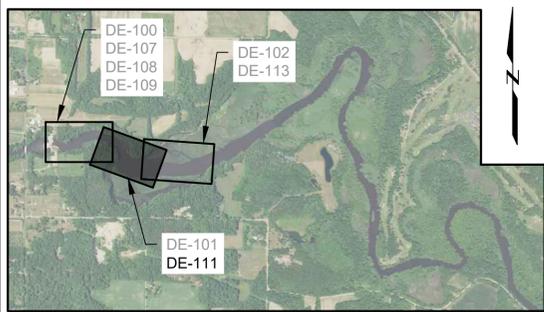
WORK SEQUENCE PLAN
 SHEET 4 OF 4

DWG. NO.
 GE-010

SHEET NO.

Appendix B: Corrected PCB Removal Cross Section(s)

Cross-sections included are those modified after PDI Phase 3 cores were taken into account in the dredge prism.



KEY PLAN

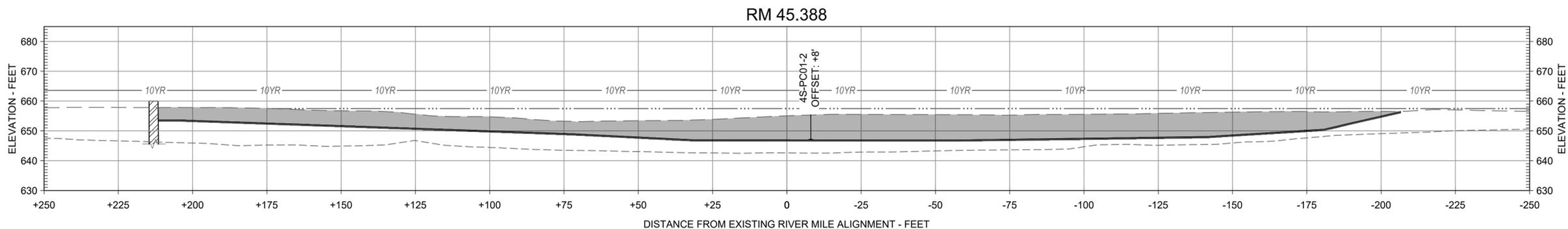
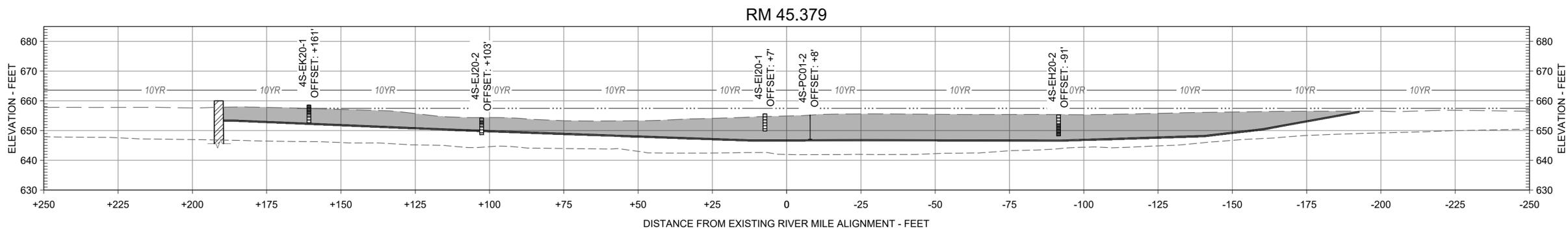
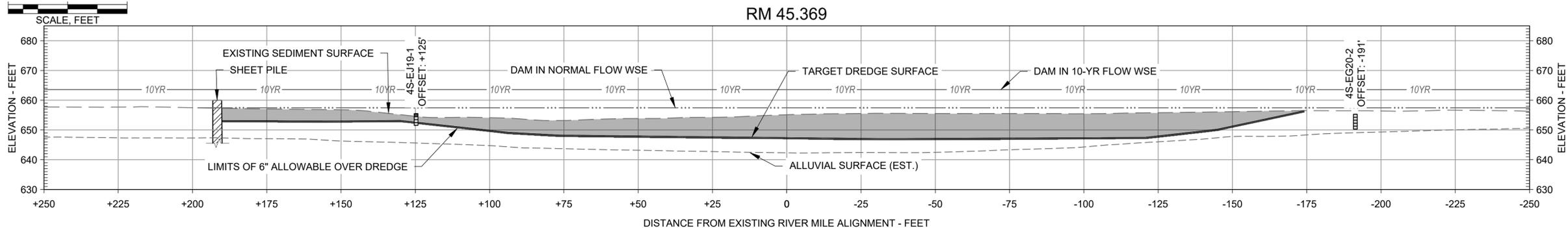
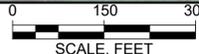
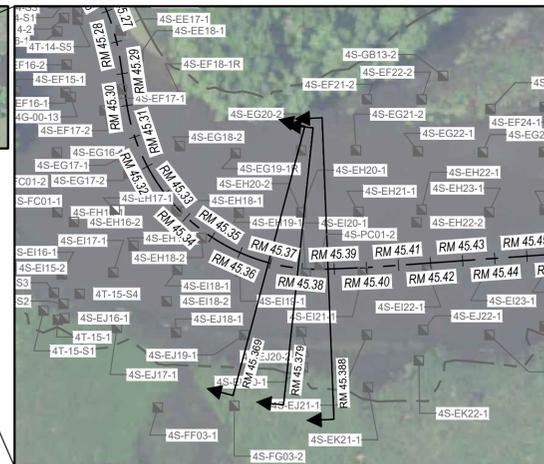


FOR BIDDING PURPOSES ONLY

Attention: If this scale bar does not measure 1" then drawing is not original scale.	5	9/14/2023	FOR BIDDING PURPOSES ONLY	CRP	 GEI CONSULTANTS OF MICHIGAN, P.C. 3065 AKERS MILL ROAD, SUITE 235 ATLANTA, GEORGIA 30339	Designed:	CRP	 AREAS 2, 3 AND 4 TCRA GEI Project 2000273	OU5 Allied Paper/Portage Creek/Kalamazoo River Superfund Site Area 4 TCRA - Allegan County, Michigan DREDGING AND BANK REMOVAL PLAN RM45.17-RM45.43	DWG. NO. DE-111 SHEET NO.
	4	6/16/2023	FOR BIDDING PURPOSES ONLY	CRP		Checked:	PCJ			
	3	10/31/2022	FOR BIDDING PURPOSES ONLY	CRP		Drawn:	GLS/LCP			
	2	9/9/2022	90% DESIGN SUBMITTAL	CRP		Approved by:	CRP			
	1	10/25/2021	60% DESIGN SUBMITTAL	CRP						
No.	DATE	ISSUE/REVISION	APP							



KEY PLAN



LEGEND:

- PCBs <1 MG/KG
- PCBs 1-<5 MG/KG
- PCBs 5-<50 MG/KG
- PCBs ≥50 MG/KG
- ARCHIVED SAMPLE INTERVAL



Attention:
 0 1"
 If this scale bar does not measure 1" then drawing is not original scale.

No.	DATE	ISSUE/REVISION	APP
5	9/14/2023	FOR BIDDING PURPOSES ONLY	CRP
4	6/16/2023	FOR BIDDING PURPOSES ONLY	CRP
3	10/31/2022	FOR BIDDING PURPOSES ONLY	CRP
2	9/9/2022	90% DESIGN SUBMITTAL	CRP
1	10/25/2021	60% DESIGN SUBMITTAL	CRP



Designed: CRP
 Checked: PCJ
 Drawn: GLS/LCP
 Approved by: CRP



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OU5 Allied Paper/Portage Creek/Kalamazoo River Superfund Site
 Area 4 TCRA - Allegan County, Michigan

**DREDGING SECTIONS
 RM45.369-RM45.388**

DWG. NO.
DE-314

SHEET NO.