



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

US EPA RECORDS CENTER REGION 5



494931

REPLY TO THE ATTENTION OF:

MEMORANDUM

SUBJECT: Approval for a Time-Critical Removal Action at the Otsego Township Dam Area of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site, Allegan County, Michigan (EPA ID MID006007306)

FROM: Paul Ruesch, On-Scene Coordinator *Paul Ruesch*
Emergency Response Branch 2 - Section 3

THRU: Samuel Borries, Chief *Sam Borries*
Emergency Response Branch 2

TO: Richard C. Karl, Director
Superfund Division

I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of the time-critical removal action (TCRA) described herein for the "Otsego Township Dam Area," an area of contamination within Area 3 of Operable Unit #5 (OU5) of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site (the Site). The Site, which is located in Kalamazoo and Allegan Counties, Michigan, is primarily and pervasively contaminated with polychlorinated biphenyls (PCBs).

The response action described in this Action Memorandum will mitigate threats to public health, welfare, and the environment upstream of the Otsego Township Dam¹ posed by the ongoing uncontrolled releases of PCBs and potential for further uncontrolled release of high levels of PCBs into the food chain from instream sediments and riverbank/floodplain soils of the Kalamazoo River at the Otsego Township Dam Area. For the purposes of this Action Memorandum, the "Otsego Township Dam Area" is the areal extent of PCB-contaminated material along the 1.7 mile stretch of the Kalamazoo River between the M-89 (Lincoln Road) bridge and the Otsego Township Dam (see Figure 1), and includes instream sediments and riverbank/floodplain soils.

The Otsego Township Dam Area contains contaminated sediment and soil with high levels of PCBs. Riverbank erosion and instability cause the continued release of PCBs into the Kalamazoo River. The Otsego Township Dam was in very poor condition and on the brink of

¹ The Otsego Township Dam is located in Otsego Township of Allegan County at River Mile (RM) 49.6 of the Kalamazoo River.

failing. In response to the failure risk, the State of Michigan (the State) installed a temporary water control structure that is engineered to last approximately three years. Installation of the temporary water control structure was completed in March 2016. Failure or removal of the temporary water control structure prior to the implementation of the removal action described in this Action Memorandum would lead to highly concentrated PCB-contaminated sediments being released to the riverbanks, floodplains, and instream sediments where contamination does not currently exist or exists at lower levels.

Due to these circumstances (sediments and soils contaminated with high levels of PCBs, potential for erosion, and risk of actual or potential exposure to animals or the food chain) the response action set forth in this Action Memorandum is time-critical. The TCRA includes dredging and/or excavation of sediment and soil; containment of PCB-contaminated material; water treatment; shoreline and riverbank stabilization; off-site disposal of removed PCB-contaminated materials managed in accordance with EPA's Toxic Substances Control Act (TSCA) (40 C.F.R. Part 761) and the off-site rule (40 CFR § 300.440); and monitoring. EPA estimates that the TCRA will remove approximately 120,000 yd³ of PCB-contaminated material.

II. SITE CONDITIONS AND BACKGROUND

CERCLIS ID # MID006007306

A. Site Description

1. Removal Site Evaluation

The Administrative Record (found in Attachment 2) contains numerous reports which summarize investigations at the Site. EPA bases its decision to implement the TCRA described in this Action Memorandum in large part on the three investigations and two risk assessments described below:

a) State-lead Remedial Investigation/Feasibility Study (RI/FS)

Between 1990 and 2003, the State and various potentially responsible parties (PRPs) conducted Site-wide remedial investigation (RI) and feasibility study (FS) work. The RI field work included an assessment of the physical characteristics of the riverbanks across OU5, including what is now referred to as Area 3. Based on the State's early field work, EPA has concluded that the riverbanks are a source of ongoing loading of exposed PCB-contaminated soils and sediments to the Kalamazoo River.

EPA bases its determination of an imminent and substantial endangerment in this Action Memorandum in part on the risk analysis set forth in the State's RI. The risk analysis associated with the RI identified some ways PCBs are released into the Kalamazoo River from the riverbanks. In particular, the RI report concludes that the cohesive nature of the exposed sediments allows significant portions of the riverbanks to remain in vertical-to-near-vertical repose. The fine-grained exposed sediments, however, generally overlie non-cohesive sandy sediments and soils. As a result, the faces of the banks are susceptible to erosion by river flow

during higher water stages and to undercutting by erosion of the underlying non-cohesive sediments and soils. Undercutting progresses until the overlying sediments fall into the river, typically in blocks. These blocks, or portions thereof, remain along the toe of the river at the Otsego Township Dam Area (see photographs in Attachment 3).

b) United States Geological Survey (USGS) Study

In 2005, USGS, in cooperation with EPA and the State, conducted an additional study of the channel characteristics of the Kalamazoo River. This study concluded that the erosion of the “toe” of the riverbank widens the river, resulting in steeper bank angles. Once the bank undercut exceeds its critical bank angle, the inability of the sediments to support themselves results in bank failure. EPA and State field personnel observed both significant erosion and failure of riverbanks into the river channel in May 2015 (see photographs in Attachment 3).

c) Supplemental Remedial Investigation/Feasibility Study

Beginning in 2007, and continuing through 2013, additional investigations in Area 3 of OU5, which includes the Otsego Township Dam Area, were conducted as part of the Supplemental Remedial Investigation/Feasibility Study (SRI/FS). The SRI found levels of PCBs in riverbank/floodplain soils and instream sediments as high as 156 milligrams per kilogram (mg/kg) PCBs in soil and 120 mg/kg PCBs in sediments.

The SRI investigations also indicate riverbank erosion and sloughing were contributing PCB-contaminated sediments to the Kalamazoo River. The draft SRI report concluded that the erosion and sloughing would continue to occur under both ‘dam-in’ and ‘dam-out’ scenarios.

A summary of the investigation results is presented in the ‘OU5 Kalamazoo River Superfund Site Area 3 Draft Supplemental Remedial Investigation Report’ (AMEC Foster Wheeler, 2015). This report was conditionally approved by EPA in February 2016.

d) Baseline Human Health Risk Assessments

In 1977, the State issued a public health advisory related to the PCB contamination in the Kalamazoo River. This advisory remains in place today and warns against eating a variety of fish species from the river because of PCB contamination.

In December 1991, the federal Agency for Toxic Substances and Disease Registry (ATSDR) and the State prepared a Public Health Assessment (PHA) for the Site (ATSDR, 1991). The PHA indicated that the Site was a public health hazard because of the probable exposure to hazardous substances at concentrations that might result in adverse health effects. Potential human exposure pathways of concern included incidental ingestion, inhalation of contaminated soils, and ingestion of contaminated biota, primarily fish.

In April 2003, the State completed a Baseline Human Health Risk Assessment (HHRA) for the Site (CDM, 2003), which is relevant to EPA’s determination of imminent and substantial endangerment in this Action Memorandum. The State’s assessment identified the following primary human health risk:

- Cancer risks and non-carcinogenic Hazard Quotients (HQ) exceed EPA and/or State acceptable risk limits² (cumulative carcinogenic risk > 10^{-4} and non-carcinogenic hazard quotient > 1) for both sport and subsistence fishermen. Carcinogenic risk from the consumption of fish ranges from 1.4×10^{-4} to 1.2×10^{-3} for the river segment (designated in the assessment as 'ABSA 7') encompassing the Otsego Township Dam Area. Non-carcinogenic HQs for the consumption of fish range from 2.3 to 20 for reproductive effects and 7.9 to 70 for immunological effects.

Subsequent updates to the HHRA in 2012 and 2015 concluded that unacceptable risks and hazards to human health continue to be associated with the fish ingestion pathway (ARCADIS, 2012, AMEC Foster Wheeler, 2015).

e) Ecological Risk Assessment

The State finalized its Ecological Risk Assessment (ERA) for the Kalamazoo River in April 2003. The State's ERA findings are also relevant to EPA's determination of imminent and substantial endangerment at the Otsego Township Dam Area.

The ERA focused primarily on assessing population-level risks associated with PCB contamination in abiotic media and biota. Because of the potential for PCBs to accumulate in biological tissues and exert adverse effects in upper trophic level biota, the ERA specifically considered bioaccumulation, food chain effects, and adverse effects in upper trophic level organisms. The ERA also focused on assessing the risks from PCB exposures via direct contact with contaminated surface water, streambed sediment, floodplain (exposed) sediment, and surface soil, as well as ingestion of PCB-contaminated food items.

The ERA concluded that PCB contamination at the Site presents a high to moderate ecological risk for eight animal species. Table 5.3 of the ERA identifies the estimated risks for all representative species of concern, based on estimated PCB dose (birds and mammals) or on the Site-wide average PCB concentration (aquatic receptors).

The ERA also found that PCB contamination of surface water and streambed sediment (and floodplain soils that are frequently inundated or have the potential to erode into the river) is likely to adversely affect sensitive piscivorous predators, such as mink, through consumption of PCB-contaminated prey, especially fish. Other piscivorous predators, such as bald eagles, also appear to be at high risk based on the exposure assumptions presented in the assessment. More recently, the Terrestrial Baseline Ecological Risk Assessment, updated as part of the SRI, concluded that there continues to be a potential risk to moderate to low-sensitivity insectivorous and vermivorous birds (AMEC Foster Wheeler, 2015). Terrestrial and semi-aquatic biota may

² The State has established a cancer risk target value of 1 in 100,000 (10^{-5}). Where cumulative cancer risks exceed this threshold, State risk managers may determine that some action to reduce exposure and risk may be necessary. The State risk target falls in the middle of EPA's risk range of 1 in 1,000,000 (10^{-6}) to 1 in 10,000 (10^{-4}). EPA generally considers risks within this range "acceptable," but considerations such as size of affected population may indicate that some action to reduce risk is appropriate. Above this range, EPA risk managers will ordinarily determine that such action is necessary. Both the State and EPA have HQ thresholds of 1.

also be at risk from PCB-contaminated riverbank/floodplain soils, depending on life history (e.g. foraging behavior, diet and mobility) and sensitivity to PCBs. Omnivorous birds (represented by the robin) that consume substantial numbers of soil invertebrates, such as earthworms, appear to be at moderate but still significant risk.

Finally, the United States Fish and Wildlife Service has identified two federally endangered species, three federally threatened species, and one federal candidate species that can be present in Allegan County. The Karner Blue Butterfly and the Indiana Bat both are endangered. The Bald Eagle, Northern Long-Eared Bat, and Pitcher's Thistle (a plant) are threatened in this region. The Eastern Massasauga Rattlesnake is the lone candidate species (BBL 2000b).

The State lists seven species as endangered or threatened (not including the federally-listed species) in or near the Site. Endangered species in this area include the Zigzag Bladderwort, wild American Ginseng, and the Log Fern (plants), the Creek Chubsucker (fish), Prairie Warbler (bird), Ottoe Skipper (insect), and the Spotted Turtle (reptile) (BBL, 2000).

2. Physical Location

For purposes of this Action Memorandum, the "Otsego Township Dam Area" is the areal extent of PCB contaminated instream sediments and riverbank/floodplain soils along the 1.7 mile stretch of the Kalamazoo River between the M-89 (Lincoln Road) bridge and the Otsego Township Dam (see Figure 1). The geographical coordinates of the Otsego Township Dam are 42.464996 north latitude and -85.749654 west longitude.

An Environmental Justice (EJ) analysis for the Otsego Township Dam Area is contained in Attachment 1. Screening of the surrounding area used EPA's EJ Screen Tool. EPA has reviewed environmental and demographic data for a one-mile radius surrounding the Otsego Township Dam Area, and determined there is a potential for EJ concerns at this location.

3. Site Characteristics

As stated above, the Otsego Township Dam Area is an area of contamination within Area 3 of OU5 of the Site. The Site includes approximately 77 miles of the Kalamazoo River between Morrow Dam and Lake Michigan and approximately 3 miles of Portage Creek, floodplains and wetlands adjacent to the river and creek, four paper waste disposal areas and several former paper mill properties.

The Site lies within the Great Lakes Basin in the Kalamazoo River watershed of Michigan's Lower Peninsula. The watershed drains 2,020 square miles of southwest Michigan. It reaches 162 miles into south-central Michigan, and ranges in width from 11 to 29 miles. The main channel of the Kalamazoo River flows northwest for 123 miles before ultimately emptying into Lake Michigan near Saugatuck, Michigan. EPA studies have estimated that the Kalamazoo River contributes approximately 42 pounds of PCBs to Lake Michigan per year (EPA, 2004).

The Otsego Township Dam was initially constructed as a hydro-electric dam in 1903. The dam was utilized to generate hydroelectric power until approximately 1960. The State took ownership of the dam in 1970. Since that time, the dam slowly deteriorated and fell into a state

of disrepair. Field inspections conducted in 2010 and 2011 identified several observed deficiencies and areas of concern with the structure and the reports for those years conclude that the dam was in 'very poor' condition (SME, 2010/2011). Subsequent field inspections in 2012-2014 identify additional deterioration in concrete as well as the presence of sinkholes adjacent to the spillway. Photographs of deteriorating conditions at the dam are found in Attachment 3. Emergency actions were identified to prevent failure of the dam (SME, 2012/2013/2014).³

In April 2015, the State concluded that the dam had inadequate spillway capacity and could fail as result of a storm event, internal erosion, or deterioration of structural components. The State further concluded that there was not enough time to implement emergency measures to stabilize the affected area(s), and recommended installation of a temporary water control structure prior to dam removal. (SME, 2015).

In July 2015, the State notified EPA of plans to remove the Otsego Township Dam and install a temporary water control structure. EPA approved the request in August 2015 along with plans to remove and dispose of any PCB-contaminated sediments or soils related to the project (EPA, 2015). The State initiated the project in late 2015, and work was completed in March 2016. For purposes of the work described in this Action Memorandum, the temporary water control structure will serve to maintain current water levels in the Kalamazoo River while PCB-contaminated instream sediments and riverbank/floodplain are dredged and/or excavated. A photograph of the temporary water control structure can be found in Attachment 3.

The structure has an estimated lifespan of 3 years (AECOM/MDNR, 2015). The design life of the steel and wooden structure is expected to be impacted by deterioration due to scour of steel sheet pile coating from water velocity and local corrosion over time. In addition, the structure is likely to be damaged by large debris, ice, and flooding impacts. As such, EPA plans to complete the work described herein within the next two years.

4. Release or threatened release into the environment of a hazardous substance, or pollutant or contaminant

A release to the environment of a hazardous substance, pollutant, and/or contaminant has occurred and continues to occur at the Otsego Township Dam Area due to ongoing riverbank erosion (see photographs in Attachment 3). EPA documented the presence of high levels of PCBs, a hazardous substance, as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14), within instream sediments and riverbank/floodplain soils at the Otsego Township Dam Area. The human health impacts from high PCB levels are described in Section III. Possible exposure routes for wildlife contact with hazardous substances includes direct contact with contaminated riverbank/floodplain soils, and consumption of fish and earthworms that accumulate PCBs.

³ In response to a request from the State, the EPA Great Lakes Regional Program Office sponsored a stakeholder meeting and design workshop in January 2014 to develop engineering plans for construction of a temporary sediment control structure to (1) allow for removal of the existing dam, and (2) limit downstream transport of sediments (CH2MHILL, 2014).

Samples taken at the Otsego Township Dam Area show PCB concentrations in riverbank/floodplain soils up to 120 mg/kg and instream sediments up to 156 mg/kg. These levels are orders of magnitude higher than the clean-up goals established for other response actions at OU5.

EPA has not yet selected remediation goals for Area 3 of OU5, but at this time believes that those remediation goals will be consistent with the final remediation goals selected for Area 1, which are 0.33 mg/kg (surface-weighted average concentration⁴) for instream sediments, 2.5 mg/kg for residential floodplain soils, and 11 mg/kg for non-residential floodplain soils (CDM, 2003).

5. NPL Status

The Site was listed on the NPL on August 30, 1990. In 2002, EPA assumed the enforcement lead from the State for most operable units of the Site, including OU5.

6. Maps and Pictures

The following figures can be found attached to this Action Memorandum:

Figure 1. Location of Otsego Township Dam Area

Figure 2. Estimated Excavation Area Map for Otsego Township Dam Area

The following photographs depicting site conditions can be found in Attachment 3 of this Action Memorandum:

Photograph 1. Riverbank erosion of contaminated soils on south bank (May 2015)

Photograph 2. Riverbank erosion of contaminated soils on south bank (May 2015)

Photograph 3. Deterioration of concrete spillway structure and sinkhole (May 2015)

Photograph 4. Deterioration of earthen/concrete portion of dam (May 2015)

Photograph 5. Temporary water control structure in operation (March 2016)

⁴ A surface-weighted average concentration (SWAC), is a method of spatially calculating the mean (average) concentration of a constituent (i.e., total PCBs) in the sediment surface. Samples are collected throughout the area of concern, representative sub-areas are generated for each sample location, and a subarea-weighted concentration is calculated to produce the SWAC. The subareas may be generated using several different methods, such as grids or stream tubes.

B. Other Actions to Date

1. Previous actions

Previous actions have been documented in Section II.A.1.

2. Current Actions

The Site continues to be addressed through the Superfund remedial process. Subsequent to completion of the TCRA and through the Superfund remedial process, EPA will complete its evaluation of the risks to human health and the environment presented by the presence of PCBs within Area 3 of OU5. This evaluation will consider data collected and analyses performed as part of the TCRA described in this Action Memorandum. EPA will then issue a Record of Decision (ROD) for Area 3 of OU5.

C. State and Local Authorities' Roles

1. State and local actions to date

Previous actions by the State have been documented in Section II.A.1.

2. Potential for continued state/local response

EPA has taken the lead on CERCLA response activities at the Site. EPA will continue working in consultation with the State during the proposed removal and remedial activities associated with the Site.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

Conditions present at the Otsego Township Dam Area constitute a threat to public health, welfare or the environment based upon the factors set forth in 40 C.F.R. Part 300.415(b)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). These include, but are not limited to, the following:

- **Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants;**

PCBs are a hazardous substance, as defined by Section 101(14) of CERCLA. PCBs are listed as a hazardous substance under Section 311(b)(2) of the Clean Water Act, as set forth in 40 C.F.R. Part 116.4, Table A. EPA has determined that PCBs are a probable human carcinogen. In addition, exposure to PCBs is widely associated with measurable adverse immunological and developmental effects in humans, particularly developing fetuses (MDPH, 2012). These

chemicals have the potential to bio-magnify, which means that they have the potential to increase in concentration as they are transferred from one link in the food chain to another.

The Otsego Township Dam Area has PCB levels up to 156 mg/kg for instream sediments and 120 mg/kg for riverbank/floodplain soils. The ongoing, uncontrolled erosion of soils from the riverbanks is a significant source of PCB loading to the Kalamazoo River. The 2015 draft SRI report documented PCB-containing wastepaper residuals and soils sloughing off the riverbanks into the Kalamazoo River and transported downstream. Erosion pins installed in 2000 along transects at 10 different locations were utilized to establish riverbank/floodplain soils and PCB erosion rates, which are reported in the Area 3 SRI document. The 2015 draft SRI report described the erosion along the riverbanks to be greater than previously understood (see photographs in Attachment 3). Instream sediments and riverbank/floodplain soils are primary sources of an ongoing release of PCBs into the Kalamazoo River.

Although the 1977 State fish consumption advisory is still in effect, it is not legally binding. State personnel and local officials have reported that anglers fishing at the Site are taking home fish in amounts that may be inconsistent with consumption advisories issued by the State (MDPH, 2015). It has also been reported that turtles have been taken from the river for human consumption, which would provide for another potential human exposure pathway.

The most significant outcome of the ecological and human health risk assessments is the conclusion that fish consumption is the primary exposure pathway for receptors that may be at risk from PCB within media of the Kalamazoo River. Therefore, the key to reducing exposure and potential risks to important receptors (e.g. fish-eating birds, fish-eating wildlife, and humans) is to reduce PCB concentrations in the fish tissue consumed by these receptors. The SRI concluded the greatest factor controlling PCB levels in fish is bioavailability of PCB in surface sediments and the water column where fish and their prey come in contact with or ingest PCBs.

- **High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate;**

The Otsego Township Dam Area has PCB levels up to 156 mg/kg for instream sediments and 120 mg/kg in riverbank/floodplain soils. As explained above, sediments and riverbank/floodplain soils located instream or near the river's edge are susceptible to erosion and scouring. During high water events, increases in river velocity create conditions cause additional releases of PCB to the Kalamazoo River, and ultimately, Lake Michigan (EPA, 2004).

Further, if the temporary water control structure were to fail, contaminated instream sediments would be transported downriver. These contaminated sediments would spread PCB-contaminated sediments onto riverbanks and floodplains previously characterized as not having PCB contamination above risk-based levels. This may also require EPA to conduct response actions to address either human health threats related to direct exposure of residents or recreational users to riverbank/floodplain soils or exacerbated ecological threats at areas where responses may not otherwise be necessary.

- **Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;**

The Kalamazoo River is often subjected to extreme weather conditions in the winter and spring which increase the threat of a release of PCBs. The breakup of ice in the late winter, and the movement of ice floes downstream, causes scouring of the banks and river bottom and may adversely impact the temporary water control structure. Likewise, heavy spring rains and/or summer storms increase stream volume and flow velocity, which lead to increased scouring of the river bottom and riverbanks. All of these forces cause an increase in the volume and extent of PCB contamination in the Kalamazoo River and Lake Michigan.

IV. ENDANGERMENT DETERMINATION

EPA concludes that unless addressed by implementing the response action detailed in this Action Memorandum, the conditions at the Otsego Township Dam Area, the nature of the hazardous substances found there, the potential exposure pathways described in Sections II and III above, and the actual or threatened release of PCBs from the Otsego Township Dam Area, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

V. PROPOSED ACTIONS

A. Description of the Proposed Action

The preferred response action to mitigate threats associated with PCB-contaminated sediments and soils in the Otsego Township Dam Area consists of removing contaminated instream sediments and riverbank/floodplain soils. The TCRA will include, but may not be limited to, the following tasks:

- 1) Dredging and/or excavation of PCB-contaminated instream sediments and riverbank/floodplain soils with elevated PCB concentrations (see estimated excavation area map in Figure 2);
- 2) Cut-back and stabilization of riverbanks to mitigate exposures to PCB-contaminated riverbank/floodplain soils and future erosion;
- 3) Dewatering, as necessary, and disposal off-site of all PCB-contaminated instream sediments and riverbank/floodplain soils removed pursuant to tasks 1 & 2 above. PCB-contaminated material with PCB concentrations ≥ 50 mg/kg shall be transported off-site to a TSCA waste landfill that is in compliance with all state and federal regulatory requirements. PCB-contaminated material with PCB concentrations < 50 mg/kg shall be transported off-site and disposed in an appropriately licensed and permitted commercial landfill in compliance with all state and local laws;
- 4) Ensuring that a stable river channel exists post-removal, including backfilling as appropriate and re-vegetation with native plant species; and

- 5) Conducting appropriate monitoring and maintenance both during and for a defined time period after completion of the work described above.

The TCRA will be conducted in a manner not inconsistent with the NCP. The OSC has initiated planning for provision of post-removal site controls consistent with the provisions of Section 300.415(l) of the NCP.

The actions described in this Action Memorandum directly address actual or threatened releases of hazardous substances, pollutants, or contaminants at the Otsego Township Dam Area which pose an imminent and substantial endangerment to public health, welfare and the environment. The activities related to the TCRA will require an estimated two construction seasons on-site to complete, with continued post-removal monitoring and maintenance for a defined time period, typically 12 months.

B. Cleanup Standards

EPA has established the following cleanup standards for the Otsego Township Dam Area:

- Instream sediments: ≤ 1.0 mg/kg.
- Riverbank/floodplain soils: ≤ 5.0 mg/kg.

The standards are based on preliminary remediation goals (PRGs) expected to be sufficiently protective of human (anglers, recreationists and residents) as well as ecological (wildlife) receptors set forth in the updated Human Health Risk Assessment (HHRA) (CDM, 2003) and are consistent with prior TCRAs conducted in Area 1 of OU5 of the Site. The PRGs were established based on risk-based concentration (RBC) values for fish tissue, soil and sediment defined in the human health and ecological risk assessments conducted at this Site and referenced in Section II.A of this Action Memorandum. RBCs are calculated, chemical-specific concentrations below which no significant health risks are anticipated for a receptor. The PRGs are also based on the State's screening and target level for PCBs.

EPA anticipates that the cleanup standards for PCBs in Area 3 of OU5 will be consistent with the cleanup standards set forth in the ROD for Area 1 of OU5, which was issued in September 2015. EPA expects to achieve a surface weighted average concentration of 0.33 mg/kg total PCBs (set forth in the HHRA) for instream sediments by removing contaminated riverbank/floodplain soil with PCBs greater than 5 mg/kg and instream sediments with PCBs at levels greater than 1 mg/kg. Additionally, past work with PCB-contaminated soils has found a "neat line" exists in subsurface riverbank/floodplain soils above which contamination is present and below which it is not. Sampling data along this "neat line" has been found to be at the 5.0 mg/kg cleanup goal, making 5.0 mg/kg a practicable cleanup goal.

C. Orderly Transition to Remedial Response

The NCP requires that, if EPA determines that a removal action will not fully address a release, and that subsequent remedial action may be necessary, then the Agency must ensure an orderly

transition from removal to remedial response activities (40 C.F.R. Part 300.415(g)). As noted above, subsequent to the TCRA described in this Action Memorandum, EPA will complete its evaluation, through the Superfund remedial process, of risks to human health and the environment within Area 3 of OU5 (which includes the Otsego Township Dam Area). Residual risks to human health and the environment remaining within Otsego Township Dam Area after completion of the removal action will be evaluated as part of that process. If EPA determines that additional response work is necessary in the Otsego Township Dam Area, such work will be required by the ROD.

D. Applicable or Relevant and Appropriate Requirements

Pursuant to 40 C.F.R. Part 300.415, removal actions shall, to the extent practicable considering the exigencies of the situation, attain applicable or relevant and appropriate requirements (ARARs) of federal and state law. Federal ARARs for this TCRA may include:

- Clean Air Act requirements related to emission of air contaminants in quantities that can cause harmful effects to human health, animal life, plant life, and/or property found at 40 C.F.R. Part 50.
- Clean Water Act (CWA) requirements at 40 C.F.R. Part 231 and 33 C.F.R. Parts 320 - 330 apply to all existing, proposed, or potential areas for discharges of dredged or fill materials into the Kalamazoo River.

If water is treated during removal action and discharged to a publicly-owned treatment works (POTW), the influent requirements of these facilities must be met prior to discharging to the POTW, as prescribed 40 C.F.R. Parts 136 and 403. These regulations also provide guidelines establishing test procedures for the analysis of pollutants.

If water is treated during the removal action and discharged back into the river, on-site discharges from the Site must meet the substantive National Pollutant Discharge Requirements (NPDES) requirements related to ambient water quality standards and effluent standards, both of which are set by the State in relation to the Kalamazoo River.

- TSCA requirements for the dewatering of PCB-contaminated sediment and for the storage and transport of PCBs found at 40 C.F.R. Part 761.61(b) (specifies cleanup and disposal options for PCB remediation waste including sediment and dredged materials), 40 C.F.R. Part 761.65 (establishes technical requirements for temporary storage of PCB wastes prior to treatment or disposal), and 40 C.F.R. Part 761.79 (provides decontamination standards and procedures for removing PCBs that are regulated for disposal from water, organic liquids, and other materials).

By letter dated August 4, 2015, EPA requested that the State identify potential state ARARs for this TCRA. Any state ARARs identified in a timely manner for this TCRA will be complied with to the extent practicable. To date, the State has not provided EPA with a list of ARARs.

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Continued risk to public health and the environment will result if the TCRA is delayed or not taken. Delayed action increases the risk of failure of the temporary water control structure before the completion of the TCRA, which would spread the contamination downstream and increase the likelihood for wildlife populations to come into direct contact with PCB-contaminated sediments and riverbank/floodplain soils. In addition to the risks associated with failure of the water control structure, delay or non-action would likely result in erosion of high levels of PCB-contaminated riverbank/floodplain soils and instream sediment to both the water column and surface soils, allowing for easy uptake of PCBs by fish, worms, plants and other organisms of the food chain in this area and downstream.

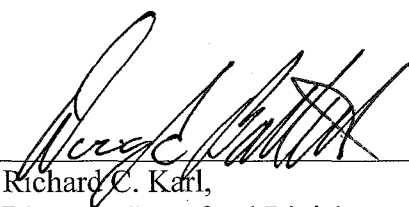
VII. OUTSTANDING POLICY ISSUES

No outstanding policy issues have been identified in relation to the Otsego Township Dam Area.

VIII. RECOMMENDATION

This decision document represents the selected response action for the Otsego Township Dam Area of the Site. It was developed in accordance with CERCLA and is not inconsistent with the NCP. This decision is based upon the Administrative Record for the TCRA, an index of which is attached to this Action Memorandum (Attachment 2).

Conditions at the Otsego Township Dam Area meet the criteria of Section 300.415(b)(2) of the NCP for a TCRA, and I recommend your approval of the TCRA described herein. EPA expects that a PRP (or multiple PRPs) will perform all removal actions under the oversight of the OSC. You may indicate your decision by signing below.

APPROVE:  DATE: 4/6/2016
for Richard C. Karl,
Director, Superfund Division

DISAPPROVE: _____ DATE: _____
Richard C. Karl,
Director, Superfund Division

Enforcement Addendum

Figures:

1. Site Location Map
2. Site Excavation Area Map

Attachments:

1. Environmental Justice Analysis
2. Administrative Record Index
3. Site Photographs

cc: B. Schlieger, U.S. EPA, 5203-G
L. Nelson, U.S. DOI, w/o Enf. Addendum
J. Sygo, Michigan DEQ, w/o Enf. Addendum
P. Synk, Michigan AG, w/o Enf. Addendum
M. Sargent, Michigan DNR, w/o Enf. Addendum

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**NOT RELEVANT TO SELECTION
OF REMOVAL ACTION**

ENFORCEMENT ADDENDUM

HAS BEEN REDACTED – THREE PAGES

ENFORCEMENT CONFIDENTIAL

NOT SUBJECT TO DISCOVERY

FOIA EXEMPT

NOT RELEVANT TO SELECTION

OF REMOVAL ACTION

FIGURE 1

SITE LOCATION MAP

Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site –
Otsego Township Dam Area

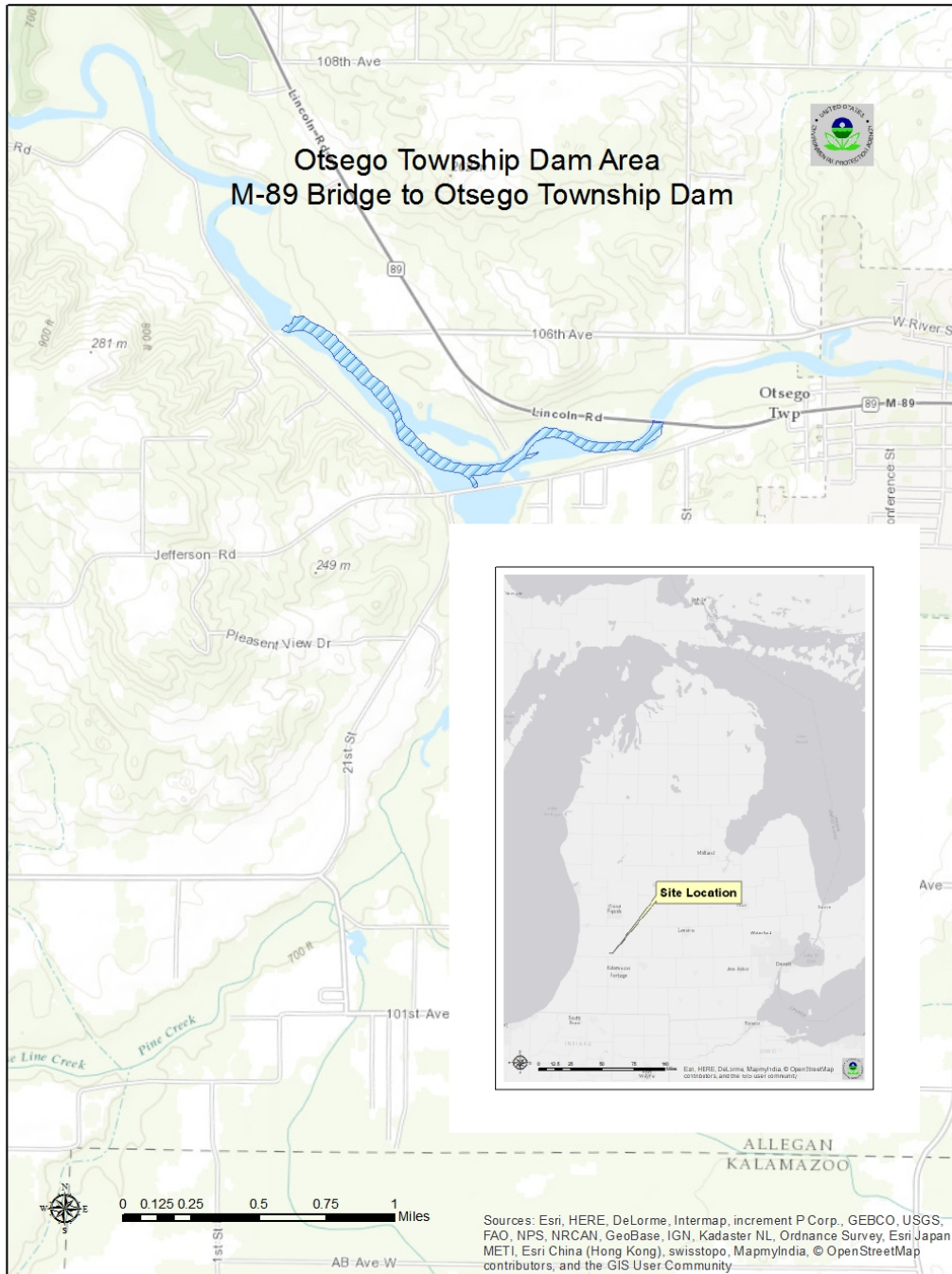
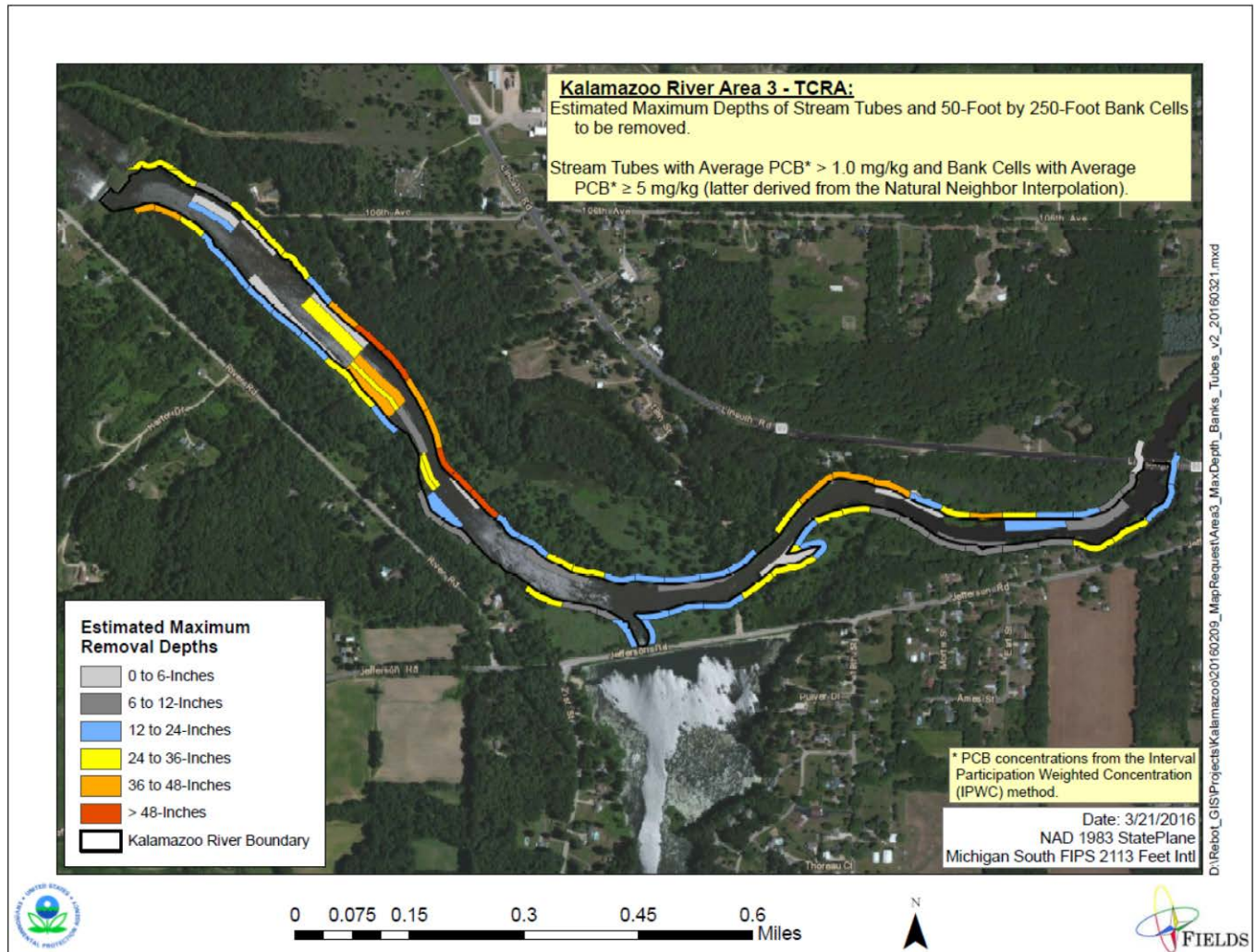


FIGURE 2

SITE EXCAVATION AREA MAP
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site
Otsego Township Dam Area



Attachment 1

EJ Analysis

(3 pages)

EJSCREEN Report

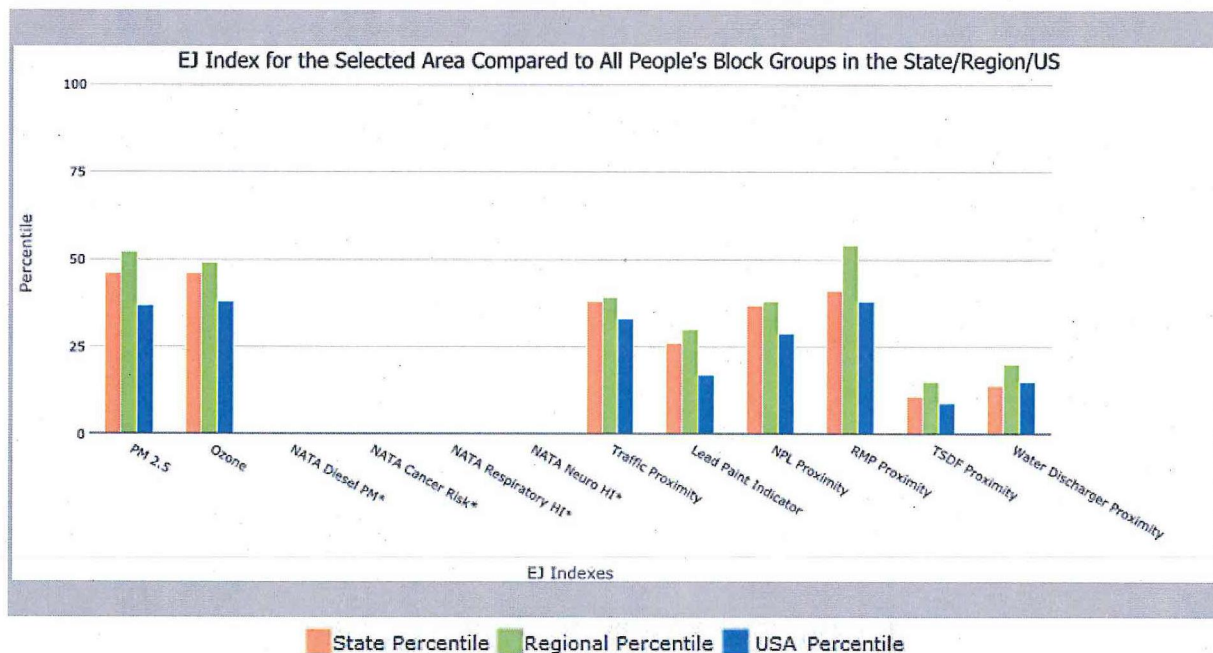


for 1 mile Ring Centered at 42.456978,-85.736836, MICHIGAN, EPA Region 5

Approximate Population: 557

Otsego Township Dam Area

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	46	52	37
EJ Index for Ozone	46	49	38
EJ Index for NATA Diesel PM*	N/A	N/A	N/A
EJ Index for NATA Air Toxics Cancer Risk*	N/A	N/A	N/A
EJ Index for NATA Respiratory Hazard Index*	N/A	N/A	N/A
EJ Index for NATA Neurological Hazard Index*	N/A	N/A	N/A
EJ Index for Traffic Proximity and Volume	38	39	33
EJ Index for Lead Paint Indicator	26	30	17
EJ Index for Proximity to NPL sites	37	38	29
EJ Index for Proximity to RMP sites	41	54	38
EJ Index for Proximity to TSDFs	11	15	9
EJ Index for Proximity to Major Direct Dischargers	14	20	15



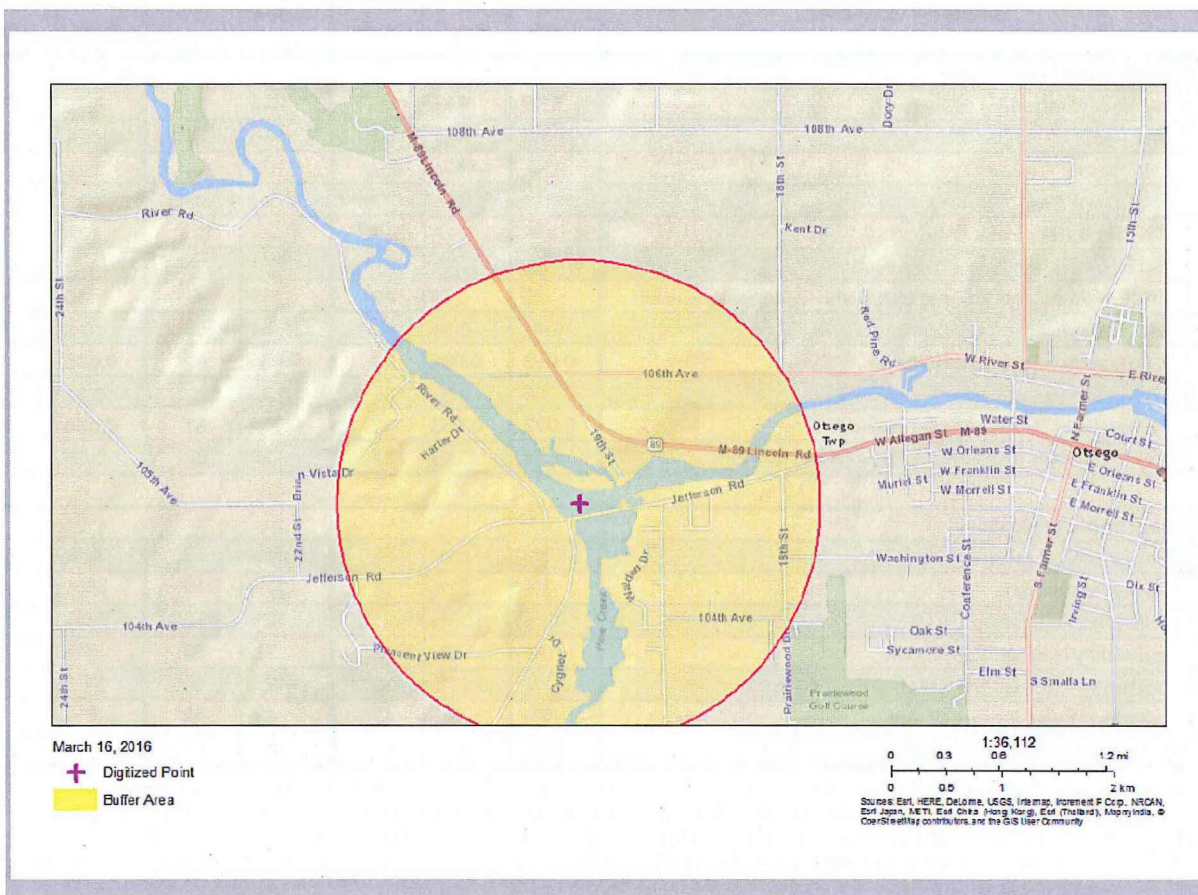
This report shows environmental, demographic, and EJ Indicator values. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJSCREEN Report

for 1 mile Ring Centered at 42.456978,-85.736836, MICHIGAN, EPA Region 5

Approximate Population: 557

Otsego Township Dam Area



EJSCREEN Report

for 1 mile Ring Centered at 42.456978,-85.736836, MICHIGAN, EPA Region 5

Approximate Population: 557

Otsego Township Dam Area



Selected Variables	Raw Data	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in $\mu\text{g}/\text{m}^3$)	9.76	9.75	40	10.8	16	9.78	45
Ozone (ppb)	45.6	44.7	54	44.4	60	46.1	45
NATA Diesel PM ($\mu\text{g}/\text{m}^3$) [*]	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NATA Cancer Risk (lifetime risk per million) [*]	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NATA Respiratory Hazard Index [*]	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NATA Neurological Hazard Index [*]	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Traffic Proximity and Volume (daily traffic count/distance to road)	23	79	42	69	47	110	39
Lead Paint Indicator (% Pre-1960 Housing)	0.44	0.39	63	0.4	60	0.3	70
NPL Proximity (site count/km distance)	0.058	0.095	63	0.086	62	0.096	57
RMP Proximity (facility count/km distance)	0.095	0.21	46	0.33	27	0.31	33
TSDF Proximity (facility count/km distance)	0.092	0.063	82	0.051	87	0.054	86
Water Discharger Proximity (facility count/km distance)	0.34	0.19	87	0.23	82	0.25	82
Demographic Indicators							
Demographic Index	23%	29%	52	28%	55	35%	39
Minority Population	3%	23%	16	24%	19	36%	10
Low Income Population	43%	35%	68	32%	72	34%	68
Linguistically Isolated Population	0%	2%	63	2%	59	5%	45
Population With Less Than High School Education	7%	11%	38	12%	40	14%	35
Population Under 5 years of age	5%	6%	42	6%	38	7%	37
Population over 64 years of age	15%	14%	61	13%	63	13%	65

^{*} The National-scale Air Toxics Assessment (NATA) environmental indicators and EJ indexes, which include cancer risk, respiratory hazard, neurodevelopment hazard, and diesel particulate matter will be added into EJSCREEN during the first full public update after the soon-to-be-released 2011 dataset is made available. The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: <http://www.epa.gov/ttn/atw/natamain/index.html>.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

March 16, 2016

3/3

Attachment 2

Administrative Record

(4 pages)

**U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL ACTION**

**ADMINISTRATIVE RECORD
FOR THE
ALLIED PAPER/PORTAGE CREEK/KALAMAZOO RIVER SITE
OTSEGO TOWNSHIP DAM AREA
OTSEGO, ALLEGAN COUNTY, MICHIGAN**

**ORIGINAL
APRIL 6, 2016
SEMS ID: 925254**

<u>NO.</u>	<u>SEMS ID</u>	<u>DATE</u>	<u>AUTHOR</u>	<u>RECIPIENT</u>	<u>TITLE/DESCRIPTION</u>	<u>PAGES</u>
1	923493	Undated	Michigan Department of Community Health	Public	Fact Sheet - Eat Safe Fish in Michigan	2
2	167821	12/23/91	ATSDR	U.S. EPA	Public Health Assessment for the Allied Corp. Kalamazoo Plant	42
3	249488	10/1/00	Blasland, Bouck & Lee, Inc.	U.S EPA	Draft Phase I Feasibility Study Report for the Allied Paper/Portage Creek/Kalamazoo River Site	407
4	249490	10/1/00	Blasland, Bouck & Lee, Inc.	U.S EPA	Draft Phase I Remedial Investigation Report for the Allied Paper/Portage Creek/Kalamazoo River Site	653
5	205878	2/1/02	Roy F. Weston, Inc.	U.S EPA	Removal Assessment Report for the Allied Paper - Kalamazoo River Site	777
6	249487	4/1/03	Camp, Dresser, & McKee	U.S EPA	Final Revised Baseline Ecological Risk Assessment for the Allied Paper/Portage Creek/Kalamazoo River Site	140
7	249495	4/1/03	CH2M Hill	U.S EPA	Draft Remedial Investigation Report for the Allied Paper/Portage Creek/Kalamazoo River Site	103
8	249486	5/1/03	Camp, Dresser, & McKee	U.S EPA	Human Health Risk Assessment for the Allied Paper/Portage Creek/Kalamazoo River Site	109

<u>NO.</u>	<u>SEMS ID</u>	<u>DATE</u>	<u>AUTHOR</u>	<u>RECIPIENT</u>	<u>TITLE/DESCRIPTION</u>	<u>PAGES</u>
9	921851	2005	USGS	File	Historical and Simulated Changes in Channel Characteristics of the Kalamazoo River, Plainwell to Otsego, Michigan	67
10	923490	3/1/05	Kalamazoo River Natural Resource Trustees	Public	Fact Sheet - 2005 Kalamazoo River Natural Resource Damage Assessment - Summary of the State I Assessment	2
11	923488	3/15/05	Stratus Consulting	MDEQ	Stage I Assessment Report, Volume 1 - Injury Assessment	284
12	923489	3/15/05	Stratus Consulting	MDEQ	Stage I Assessment Report, Volume 2 - Economic Assessment	200
13	923486	9/1/05	Wesley, J., MDNR	File	Kalamazoo River Assessment - Special Report 35	377
14	249492	7/25/06	ATSDR	U.S. EPA	Health Consultation: ATSDR Response to Public Advisory Council for Kalamazoo River Area of Concern RAP Comments on the Public Health Assessment for the Allied Paper/Portage Creek/Kalamazoo River Site	18
15	923467	6/3/10	Krusinga, J., SME, Inc.	Lerg, J., MDNR	Report on Existing Conditions at Otsego Dam	19
16	923482	1/14/11	Krusinga, J., SME, Inc.	MDEQ	Report on Existing Conditions at Otsego Dam	27
17	924225	2/1/12	ARCADIS	Georgia-Pacific, LLC	Area 1 Supplemental Remedial Investigation Report - Final	303
18	923491	11/1/12	Michigan Department of Community Health	File	Health Consultation - Technical Support Document for a Polychlorinated Biphenyl Reference Dose as a Basis for Fish Consumption Screening Values	107
19	923468	11/9/12	MDEQ	File	Otsego Dam Photos	2
20	923472	11/13/12	Trumble, L, MDEQ	Lane, B., and Mills, M., MDEQ	Email re: Concerns Regarding Dam Conditions	4
21	923483	1/7/13	Krusinga, J., SME, Inc.	MDEQ	Report on Existing Conditions at Otsego Dam	25

<u>NO.</u>	<u>SEMS ID</u>	<u>DATE</u>	<u>AUTHOR</u>	<u>RECIPIENT</u>	<u>TITLE/DESCRIPTION</u>	<u>PAGES</u>
22	923485	6/17/13	Trumble, L., MDEQ	File	Dam Safety Inspection Report for the Otsego Dam	20
23	923470	2/21/14	CH2M Hill	U.S. EPA	Technical Memorandum - Engineering Design Team Workshop and Stakeholder Meeting for the Sediment Control Structure near Otsego Township Dam	58
24	923471	3/13/14	CH2M Hill	U.S. EPA	Draft Preliminary Design Technical Memorandum for the Otsego Township Dam Temporary Sediment Control Structure	93
25	923492	1/1/15	Michigan Department of Community Health	Public	2015 Eat Safe Fish Guide for Southwest Michigan	88
26	923484	4/3/15	Krusinga, J., SME, Inc.	MDEQ	Report on Existing Conditions at Otsego Dam	31
27	923469	7/1/15	State of Michigan Department of Technology, Management and Budget	File	Bidding and Contact Specifications for the Installation of Water Control Structure and Stabilization Measures	529
28	920817	7/6/15	AMEC Foster Wheeler	Saric, J., U.S. EPA	OU5 Kalamazoo River Superfund Site Area 3 Draft Supplemental Remedial Investigation Report, Figures & Appendices A-K <i>(Portions of this document have been redacted to protect personally-identifying information)</i>	1107
29	923466	7/29/15	Moritz, W., MDNR	Saric, J., U.S. EPA	Letter re: Amendment to Notification Letter Regarding Off- Site Disposal of Contaminated Sediments	1
30	923465	8/25/15	Karl, R., U.S. EPA	Moritz, W., MDNR	Letter re: Approval of Otsego Township Dam Removal	1
31	920815	10/4/15	Ruesch, P., U.S. EPA	Bucholtz, P., MDEQ	Letter re: Request for State ARARs for the Otsego Township Dam Area Site	4

<u>NO.</u>	<u>SEMS ID</u>	<u>DATE</u>	<u>AUTHOR</u>	<u>RECIPIENT</u>	<u>TITLE/DESCRIPTION</u>	<u>PAGES</u>
32	923464	2/4/16	Saric, J., U.S. EPA	Fortenberry, C., Georgia-Pacific LLC	Letter re: Area 3 Revised Supplemental Remedial Investigation Report Approval	3
33	925251- 925252	4/4/16	Fortenberry, C., Georgia-Pacific LLC	Saric, J., U.S. EPA	Final Supplemental Remedial Investigation Report - Operable Unit 5, Area 3	341
34	925253	4/6/16	Ruesch, P., U.S. EPA	Karl, R., U.S. EPA	Approval for a Time-Critical Removal Action at the Otsego Township Dam Area of the Allied Paper/Portage Creek/Kalamazoo River Site (<i>Portions of this document have been redacted</i>)	31

Attachment 3

Site Photographs

(3 pages)



Site: Otsego Township Dam Area

Photograph No.: 1

Date: 05/06/2015

Direction: North

Photographer: Paul Ruesch

Subject: Riverbank erosion of contaminated soils into Kalamazoo River on north bank.



Site: Otsego Township Dam Area

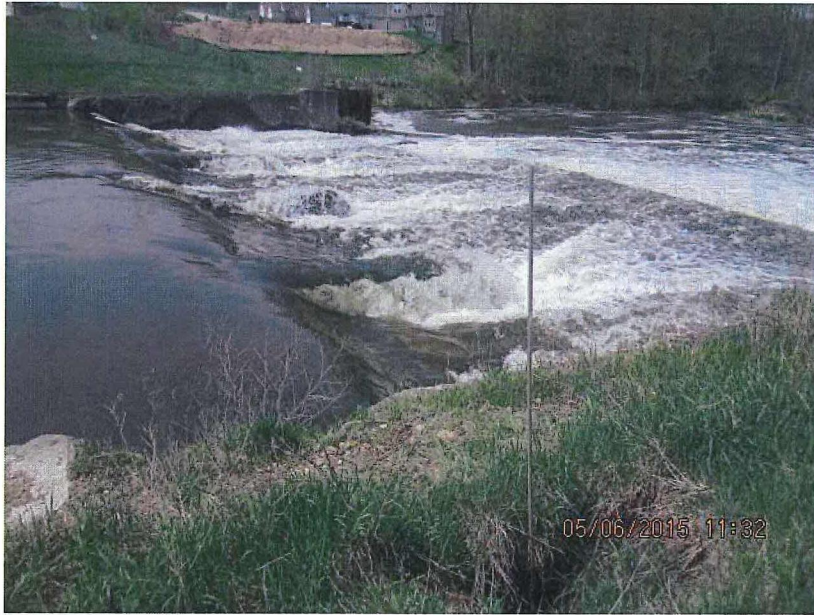
Photograph No.: 2

Date: 05/06/2015

Direction: South

Photographer: Paul Ruesch

Subject: Riverbank erosion of contaminated soils into Kalamazoo River on south bank.



Site: Otsego Township Dam Area

Photograph No.: 3

Date: 05/06/2015

Direction: South

Photographer: Paul Ruesch

Subject: Deterioration of concrete spillway structure and sinkhole (foreground), replaced by a temporary water control structure in 2016.



Site: Otsego Township Dam Area

Photograph No.: 4

Date: 05/06/2015

Direction: North

Photographer: Paul Ruesch

Subject: Deterioration of earthen/concrete portion of Otsego Township Dam, replaced by a temporary water control structure in 2016.



Site: Otsego Township Dam Area

Photograph No.: 5

Direction: Northwest

Subject: Temporary water control structure in operation.

Date: 03/18/2016

Photographer: Paul Ruesch