2015 Remedial Action Plan Status Report
for the
Lower Menominee River Area of Concern

September 6, 2016

Wisconsin Department of Natural Resources
Office of the Great Lakes

Michigan Department of Environmental Quality
Office of the Great Lakes

Cover Photos (clockwise from left):

A fish elevator was constructed at the Menominee Dam in 2015; contaminated sediment was dredged from the Menekaunee Harbor in 2014; restoration in Menekaunee Harbor in 2015 included installing a variety of habitat structures for fish and wildlife, such as this brush pile. Photos courtesy of Wisconsin Department of Natural Resources (WDNR).

Acknowledgments

We, the WDNR and the MDEQ, would like to acknowledge the many contributions of members of the Lower Menominee River AOC Citizen's Advisory Committee (CAC) and Technical Advisory Committee (TAC) in the development of this 2015 RAP Status Report, the Fish and Wildlife Population and Habitat Management Plan, previous RAPs and RAP Updates, and public outreach materials and activities. CAC and TAC collaboration with state and federal agencies has resulted in materials and activities that reflect local issues and concerns.

Purpose

This 2015 Remedial Action Plan (RAP) Status Report documents progress made on restoration of the Lower Menominee River Area of Concern (AOC) in 2015. This document is a brief summary of recent progress and the status of the AOC at the end of 2015. The WDNR and MDEQ, who share oversight of this AOC, intend to submit a longer, more detailed RAP Update in early 2017 documenting AOC progress in both 2015 and 2016, in order to effectively communicate progress to the public as well as to local, state, and federal agencies.

Background

Under the 1987 Amendment to the Great Lakes Water Quality Agreement (Agreement) (GLWQA, 1987), a treaty between the United States and Canada, AOCs were described as a "geographic area that fails to meet the General or Specific objectives of the Agreement where such failure has caused or is likely to cause impairment of beneficial use or the area's ability to support aquatic life." "Critical pollutants" were described as "substances that persist at levels that singly, or in synergistic or additive combination, are causing, or are likely to cause, impairments to beneficial uses (BUIs) despite past application of regulatory controls due to their: presence in open lake waters; ability to cause or contribute to a failure to meet Agreement objectives through their recognized threat to human health and aquatic life; or their ability to bioaccumulate." The Agreement directs that agencies approach these issues using a comprehensive and ecosystem approach to restore and protect beneficial uses and directs development of RAPs to address these issues. The agencies view this to mean to approach restoration and protections within the AOC watershed. Sources of contaminants beyond the AOC are not considered or addressed.

The Menominee River AOC boundary includes the lower three miles of the Menominee River from the Park Mill Dam (Upper Scott Dam) to the river mouth and extends approximately three miles north of the river mouth along the adjacent Green Bay shoreline to John Henes Park and three miles south of the river mouth along the adjacent Green Bay shoreline, including Seagull Bar. The AOC boundary includes portions of Marinette County in Wisconsin and Menominee County in Michigan and is within the City of Marinette, Wisconsin, and the City of Menominee, Michigan. The AOC includes six permanent islands: Blueberry, Little Blueberry, Boom, Stephenson, and Strawberry, which are found within the lower three miles of the Menominee River; and Green Island, which is located in Green Bay approximately five miles east of Seagull Bar. This description is based on the 1990 Lower Menominee River Remedial Action Plan (WDNR and MDNR, 1990) and the 1996 Lower Menominee River Remedial Action Plan Update (WDNR, 1996).

Six of the potential 14 BUIs described under the 1987 Agreement (GLWQA, 1987) were identified for the Lower Menominee River when it was designated as an AOC. These BUIs included the following: "restrictions on fish and wildlife consumption," "restrictions on dredging activities," "degradation of benthos," "degradation of fish and wildlife populations," "loss of fish and wildlife habitat," and "beach closings" (a.k.a. "restrictions on recreational contact"). Significant upgrades to the City of Marinette's and the City of Menominee's wastewater treatment plants resulted in removal of the "restrictions on recreational contact" BUI in 2011, leaving five impairments to be addressed.

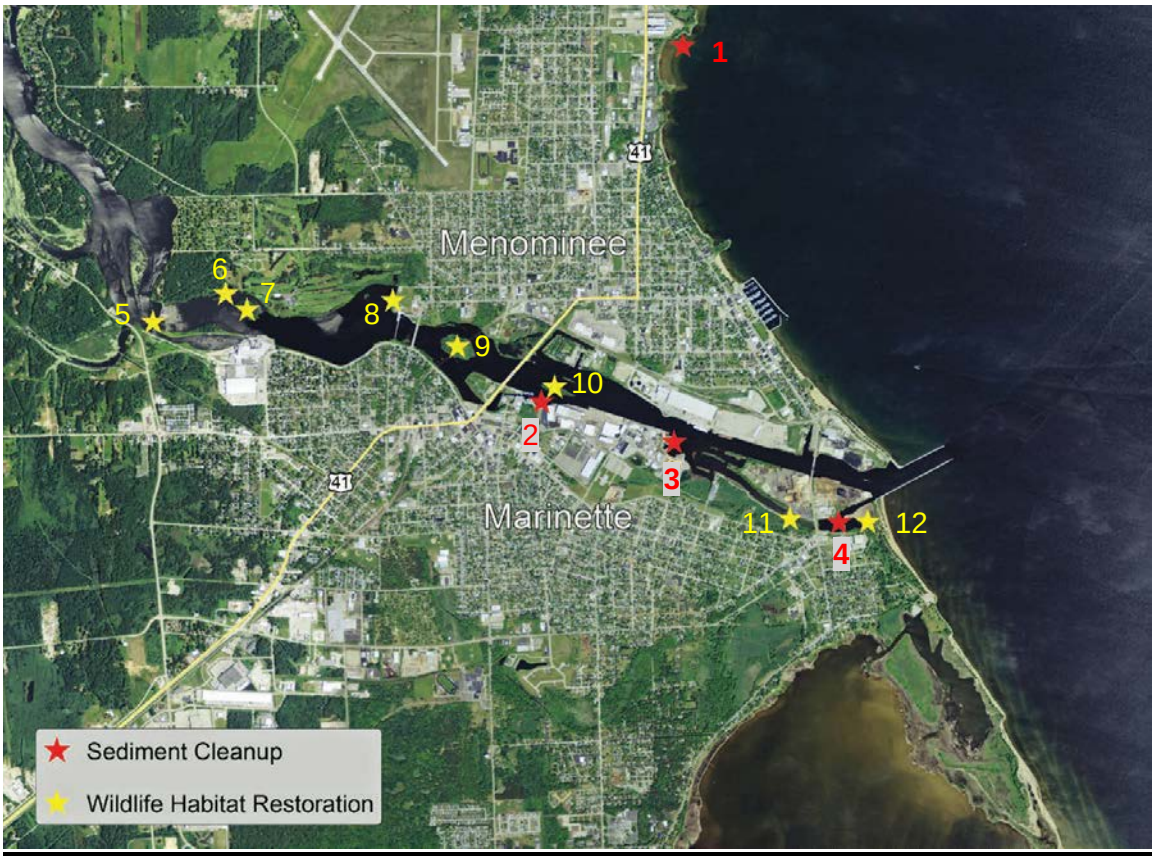

Figure 1. Restoration Sites in the Lower Menominee River Area of Concern.

Sediment Remediation Projects

Most of the identified beneficial use impairments in this AOC were influenced by the presence of contaminated sediments. All sediment remediation projects in the AOC are now complete. See below for more details on the status of the projects.

The Green Bay Paint Sludge Site, which was purchased by Lloyd-Flanders Industries, Inc., in 1982, is located north of the mouth of the Menominee River, along the Green Bay shoreline in the City of Menominee (No. 1, Figure 1). The site shoreline, water, and sediments behind the plant were contaminated with paint wastes from a previous owner. In 1992, Lloyd-Flanders was ordered by the State of Michigan to investigate and remediate the paint sludge contamination. The company completed site remediation work in 1995 and 1998. The Administrative Order also requires ongoing site maintenance, including collection of paint nodules (aka paint balls) along the Green Bay shoreline north and south of the Lloyd-Flanders plant monthly and after storm events during open water. The paint nodules are stored on-site and then disposed of at a hazardous waste facility.

The Wisconsin Public Service Corporation (WPSC) Marinette Manufactured Gas Plant Site is located along the southern bank of the Menominee River in the City of Marinette near Boom Landing (No. 2, Figure 1). While the plant was operating from 1910 to 1960, residual coal tars from the plant washed into the river via a former slough, contaminating the river sediments. Negotiations between the United States Environmental Protection Agency (USEPA) Superfund, WDNR, and WPSC resulted in a decision in 2012 to remove the coal tar contaminated

sediments. Site remediation was completed in 2013. Ongoing maintenance and monitoring includes the reactive carbon core mat and sand cover and requires a five-year review in 2018.

The Ansul/Tyco Arsenic Site is located downstream of the WPSC site along the southern bank of the Menominee River in the City of Marinette near the Tyco International plant (No. 3, Figure 1). The legacy arsenic contamination resulted from arsenic salts produced by the Ansul Fire Protection Company as a byproduct of herbicide manufacturing between 1957 and 1977. The USEPA Resource Conservation and Recovery Act (RCRA) phase one remediation, requiring arsenic levels in sediments to be at 50 parts per million (ppm) or less, was completed in 2014. The final arsenic sediment RCRA remedial action objective of 20 ppm or less was achieved in 2015 by completion of a project under the Great Lakes Legacy Act (GLLA) by USEPA, WDNR, and Tyco. Ongoing maintenance and monitoring includes the barrier wall and sand cover. The first five-year report was submitted in 2013, and the next five-year report is due in 2018.

Menekaunee Harbor is located south of the mouth of the Menominee River (No. 4, Figure 1). It is owned primarily by the City of Marinette. Sediment quality in the harbor was degraded by elevated levels of metals and polycyclic aromatic hydrocarbons (PAHs) from various upstream sources. The City and the WDNR worked together to restore the harbor in 2014 and 2015.

Sediment investigations in the Lower Scott Flowage (between the two dams) in 2013 and the Rio Vista Slough (in Michigan just upstream of US 41 highway bridge) in 2014 have confirmed that no additional remediation will be needed in those locations. Thus, all remediation actions for known contaminated sediment sources in the AOC have now been completed. See Attachment D for a summary of the current status of the legacy contamination sites in the AOC.

Degradation of Benthos and Restrictions on Dredging BUIs

The Lower Menominee River AOC BUI Restoration Targets for the benthos and dredging BUIs required remediation of the known contaminated sediments (remedial activities described above), with the additional component for the dredging BUI to include development of a Dredge Management Plan (DMP) (WDNR and MDEQ, 2008). The known contaminated sediments have been remediated, thus Wisconsin and Michigan can move forward with recommending removal of the “degradation of benthos” BUI, and then the “restrictions on dredging activities” BUI, once the DMP is completed. The states have determined, with USEPA’s concurrence, to pursue the option of combining the DMP with the restrictions on dredging activities BUI removal package, rather than completing two separate documents. Both of these BUIs could be removed in 2016.

Dredging of arsenic-contaminated sediment in the South Channel in 2014

Cheryl Bougie, WDNR

Restrictions on Fish Consumption BUI

The Michigan Department of Health and Human Services (MDHHS; formerly the Michigan Department of Community Health) and the MDEQ have conducted a statewide fish consumption advisory assessment that compared fish tissue contaminant levels in all Michigan AOCs, including the Menominee River, to non-AOC reference sites. The MDCH, MDHHS, and the WDNR will review the fish tissue assessment results in 2016 to determine impairment status. The "restrictions on fish consumption" BUI could be removed in 2016. The WDNR collected fish from the Menominee River for this assessment, and the Michigan Department of Natural Resources (MDNR) collected fish for the reference sites.

Fish and Wildlife Habitat and Populations BUIs

To remove all of the designated beneficial use impairments and delist the AOC, activities beyond the remediation of contaminated sediment sites will be required. The *2013 Fish and Wildlife Population and Habitat Management and Restoration Plan Update* (Plan; WDNR and MDEQ, 2013) is the principal document guiding the removal of the "degradation of fish and wildlife populations" and "loss of fish and wildlife habitat" impairments. As of December 31st, 2015, one of the five overarching restoration goals and five of the objectives contained in the Plan have been achieved, and many activities contributing toward the achievement of the remaining objectives have either been completed or are in progress. See Attachment A for the Goals and Objectives Table (Table 1 from the Plan), along with estimated completion dates.

The activities listed in the Activities Table (Table 2 from the Plan) have been included in the BUI Tracking Matrix in Attachment B, along with all of the other actions needed to remove BUIs and delist this AOC. Many of the activities have been completed, and many more are currently in progress. Following are some examples:

- Three years of fish population surveys were completed in the AOC and reference sites in 2015; preliminary results show that "There is evidence of recruitment in segment 1…" (Lower Scott Flowage) objective has been achieved, and final results will be evaluated in early 2016 to determine whether the lower river (segments 2-8) objective has also been achieved
- Safe downstream fish passage around Park Mill Dam (No. 5, Figure 1) was completed in 2015
- Upstream sturgeon passage (fish elevator) around Menominee (No. 8, Figure 1) and Park Mill Dams was completed in 2015
- Safe downstream fish passage around Menominee Dam planning and design work is in progress, to be implemented by September 2016
- Larval lake whitefish monitoring occurred in 2015, with the final report to be completed in 2016
- The City of Marinette Planning Commission responded to the CAC's letter in 2015 requesting protections for habitat restoration project areas by approving all of the CAC's requested zoning and planning changes; the CAC and TAC agree that the "Long-term protection…" goal has been achieved
- Removal of debris and excess riprap in South Channel (No. 11, Figure 1) below Ogden Street Bridge is in progress, to be completed in 2016
- South Channel habitat restoration project final design was completed in 2015, with implementation planned for 2016
- Menekaunee Harbor (No. 12, Figure 1) habitat restoration project implementation is in progress, to be completed in 2016, with invasive plant monitoring and treatment to follow

- Vegetation improvements (invasive species control) for rookery habitat on Little Blueberry, Blueberry, Boom, and Strawberry Islands (Nos. 6, 7, 9, and 10, respectively, Figure 1) are in progress, to be substantially completed in 2016

Photos of Little Blueberry Island before and after cutting and treatment of invasive plants in 2015

Ecology and Environment, Inc.

Ecology and Environment, Inc.

Next Steps

The "Lower Menominee River AOC BUI Tracking Matrix 2015" (Attachment B) includes more details on AOC project status, management, cost estimates, and other necessary information. The WDNR, MDEQ, CAC, and TAC agree that only activities listed in this table are required to achieve the restoration targets for this AOC.

Following is a list of significant milestones likely to be reached in 2016:

- Removal of "degradation of benthos" BUI
- Completion of Dredge Management Plan and removal of "restrictions on dredging activities" BUI
- Potential removal of "restrictions on fish consumption" BUI (depending on results of fish consumption advisory assessment)
- Completion of Menekaunee Harbor habitat restoration project implementation, followed by vegetation monitoring and maintenance
- Completion of safe downstream fish passage at Menominee Dam
- Removal of debris and excess riprap in South Channel below Ogden Street Bridge
- Implementation of South Channel habitat restoration project, followed by vegetation monitoring and maintenance
- Completion of final report for fish population monitoring in the AOC and reference sites; this report will determine whether target fish species in the lower river are meeting population objectives
- Larval lake whitefish monitoring project report completed; this study meets the criteria and no additional action is necessary
- Substantial completion of island rookery habitat restoration, followed by native vegetation planting, adaptive management, and monitoring and maintenance

The Lower Menominee River AOC is on track to complete all management actions in 2016. The states intend to propose selected BUIs for removal in 2016, and the AOC could potentially be delisted in 2018. Continued progress has only been possible with the help of many partners who have put a lot of effort into restoring the Lower Menominee River. Great Lakes Restoration Initiative (GLRI) funding has been a critical component of this restoration effort.

References/Citations

GLWQA, 1987. *Revised Great Lakes Water Quality Agreement as amended by Protocol, Signed November 18, 1987*. Consolidated by the International Joint Commission, United States, and Canada.

WDNR, 1996. *The Lower Menominee River Remedial Action Plan Update.* PUBL WR-410 96. http://dnr.wi.gov/topic/greatlakes/documents/MenomineeRiverRAP1996.pdf.

WDNR and MDEQ, 2008. *Lower Menominee River AOC Beneficial Use Impairment Restoration Targets*. http://dnr.wi.gov/topic/greatlakes/documents/MenomineeRiverDelistingTargets2008.pdf.

WDNR and MDEQ, 2013. *2013 Fish and Wildlife Population and Habitat Management and Restoration Plan Update for the Lower Menominee River Area of Concern.* http://dnr.wi.gov/topic/greatlakes/documents/Menominee2013FishAndWildlifePlan.pdf

WDNR and MDNR, 1990. *The Lower Menominee River Remedial Action Plan: Stage One Report.* PUBL WR-246 90. http://dnr.wi.gov/topic/greatlakes/documents/MenomineeRiverRAPStage1Report1990.pdf.

Attachment A: Goals and Objectives Table (Table 1) from the 2013 Fish and Wildlife Population and Habitat Management and Restoration Plan, with additional notes showing completed objectives and estimated completion dates. The achievement of goals is dependent on achieving corresponding objectives.

<table>
<tr><th colspan="5">GOALS</th></tr>
<tr><td>Long-term protection is in place for natural areas and wetlands within the AOC, including Seagull Bar and riverine islands.</td><td>Nesting populations of a diverse array of wetland-dependent and riparian-associated birds are consistently present within the AOC.</td><td>The lake sturgeon population is enhanced.</td><td>Diverse and functional native fish and mussel assemblages are present in the AOC that sustain natural recruitment.</td><td>A healthy and diverse native vegetation community has been restored.</td></tr>
<tr><th colspan="5">OBJECTIVES</th></tr>
<tr><td rowspan="3">✓
Long-term protections deemed acceptable by the WDNR, MDEQ, TAC, and CAC have been established for all natural areas where habitat improvement work has taken place and contributes to achieving one or more BUI removal objectives.</td><td rowspan="2">In Progress (2016)
Maintain or enhance habitat conducive to colonial waterbird rookery activity on known or prospective rookeries.</td><td rowspan="2">✓
Provide additional spawning and juvenile rearing habitat for lake sturgeon by providing passage upstream of both Menominee and Park Mill Dams (U.S. Fish and Wildlife Service, 2012).</td><td>In Progress (2016)
There is evidence of recruitment within segments 2-8 for the following fish species: lake sturgeon walleye, yellow perch, muskellunge, smallmouth bass, largemouth bass, and northern pike.</td><td rowspan="3">In Progress (2018)
Invasive, non-native species comprise no more than 33% of the vegetation community in protected natural areas of the AOC.</td></tr>
<tr><td>There is evidence of recruitment in segment 1 for the following fish species: walleye, rock bass, bluegill smallmouth bass, largemouth bass, and northern pike. ✓</td></tr>
<tr><td>✓
Monitor the rookery activity of known or prospective rookeries.</td><td>In Progress (2016)
Provide a means for fish to pass safely downstream of both Menominee and Park Mill Dams (USFWS, 2012).</td><td>There is evidence of recruitment within the AOC for native mussel species. ✓
In Progress (2016)
Monitor for larval lake whitefish to determine necessity of future habitat improvements.</td></tr>
</table>

Attachment B: Lower Menominee River AOC Tracking Matrix 2015

Project Name	BUI Addressed					Project Type	Action Type	Action Phases	Project Status	Project Start Date	Project End Date	Project Cost	Funding Sources	Lead Organization
	Fish & Wildlife Consumption	Fish & Wildlife Populations	Degradation of Benthos	Restrictions on Dredging	Fish & Wildlife Habitat									
Aquatic Vegetation Survey		X			X	Fish and Wildlife	Assessment	Reporting	Completed	2010	2010	$15,690	USEPA (GLRI)	WDNR
Assessment of Benthos and Plankton in Wisconsin's Lake Michigan Areas of Concern-2013			X			Fish and Wildlife	Assessment	Reporting	In Progress	2013	2016	$414,300	USGS (GLRI)	USGS
Benthos & Plankton BUIs Evaluation in Wisconsin's Lake Michigan Areas of Concern-2011			X			Fish and Wildlife	Assessment	Reporting	In Progress	2011	2016	$451,500	USGS (GLRI)	USGS
Fish Consumption Advisory Assessment	X					Fish and Wildlife	Assessment	Reporting	In Progress	2011	2016	$500,000	USEPA (GLRI)	MDEQ
Fisheries Data Roundup		X			X	Fish and Wildlife	Assessment	Reporting	Completed	2012	2013	$3,321	USEPA (GLRI)	WDNR
Fisheries Data Roundup - Reference Site Monitoring		X			X	Fish and Wildlife	Assessment	Reporting	In Progress	2013	2016	$3,058	USEPA (GLRI)	WDNR
Increase the hydrologic connection between South Channel and Menekaunee Harbor		X			X	Fish and Wildlife	Restoration	Implementation	In Progress	2014	2016	Unknown	USEPA City of Marinette	City of Marinette
Island Rookery Habitat Improvement		X			X	Fish and Wildlife	Restoration	Implementation	In Progress	2014	2017	$498,973	USACE (GLRI)	USACE
Menekaunee Harbor Restoration		X	X	X	X	Fish and Wildlife	Restoration	Implementation	In Progress	2014	2018	$7,353,058	USEPA (GLRI) WDNR City of Marinette	WDNR
Menominee Dam, Downstream Fish Passage		X			X	Fish and Wildlife	Restoration	Project Design	In Progress	2014	2016	$3,000,000	USFWS (GLRI) Eagle Creek Renewable Energy	USFWS
Menominee Dam, Upstream Fish Passage		X			X	Fish and Wildlife	Restoration	Confirmation Monitoring & Reporting	Completed	2013	2015	$3,405,706	USEPA (GLRI) Eagle Creek	USFWS
Menominee Dam, Upstream Fish Passage Truck and Transfer		X			X	Fish and Wildlife	Restoration	Project Design	In Progress	2014	2016	$20,000	Eagle Creek Renewable Energy	USFWS
Monitor for Larval Lake Whitefish		X			X	Fish and Wildlife	Assessment	Reporting	In Progress	2014	2016	$43,646	Great Lakes Protection Fund	WDNR
Monitor Rookery Activity		X			X	Fish and Wildlife	Assessment	Reporting	Completed	2013	2014	In-kind	WDNR	WDNR
Mussel Survey		X			X	Fish and Wildlife	Assessment	Reporting	Completed	2011	2012	$6,093	USEPA (GLRI)	WDNR
Park Mill Dam, Downstream Fish Passage		X			X	Fish and Wildlife	Assessment	Reporting	Completed	2013	2015	$2,258,230	NFWF (GLRI) Eagle Creek Renewable Energy	USFWS

Attachment B: Lower Menominee River AOC Tracking Matrix 2015

Project Name	BUI Addressed					Project Type	Action Type	Action Phases	Project Status	Project Start Date	Project End Date	Project Cost	Funding Sources	Lead Organization
	Fish & Wildlife Consumption	Fish & Wildlife Populations	Degradation of Benthos	Restrictions on Dredging	Fish & Wildlife Habitat									
Repeat Fish Surveys after Restoration Projects Completed (as needed)		X			X	Fish and Wildlife	Assessment	Planning	Proposed	2015	2018		TBD	
Repeat Mussel Surveys after Restoration Projects Completed (as needed)		X			X	Fish and Wildlife	Assessment	Planning	Proposed	2015	2018		TBD	
Repeat Vegetation Surveys after Restoration Projects Completed (as needed)		X			X	Fish and Wildlife	Assessment	Planning	Proposed	2015	2018		TBD	
Riparian Vegetation Survey		X			X	Fish and Wildlife	Assessment	Reporting	Completed	2011	2012	$16,500	USEPA (GLRI)	WDNR
Semi-permeable Membrane Device Study	X	X	X	X	X	Fish and Wildlife	Assessment	Reporting	Completed	2011	2012	$70,000	USEPA (GLRI)	MDEQ
South Channel Habitat Restoration		X			X	Fish and Wildlife	Restoration	Implementation	In Progress	2013	2019	$767,067	USEPA (GLRI) USFWS (GLRI)	WDNR
Dredge Management Planning				X		Sediment	Remediation	Confirmation Monitoring & Reporting	In Progress	2015	2016		In Kind	WDNR
Lloyd Flanders Paint Sludge Site Remediation			X	X		Sediment	Remediation	Confirmation Monitoring & Reporting	Completed	1989	1996	Unavailable	Responsible Party	MDEQ
Lower Scott Flowage Sediment Remediation	X	X	X	X	X	Sediment	Remediation	Sediment Characterization	Completed	2012	2014	$453,547	Great Lakes Legacy Act (GLRI)	USEPA
Rio Vista Slough Sediment Remediation	X		X	X		Sediment	Remediation	Sediment Characterization	Completed	2014	2015	$6,606	USEPA (GLRI)	MDEQ
Tyco (formerly Ansul) Arsenic Site Remediation		X	X	X	X	Sediment	Remediation	Remedial Implementation	In Progress	2009	2016	Unavailable	Great Lakes Legacy Act (GLRI) Responsible Party WDNR	USEPA
WPS Coal Tar Site Remediation		X	X	X	X	Sediment	Remediation	Confirmation Monitoring & Reporting	Completed	2012	2015	$6,500,000	Responsible Party	USEPA

Attachment C

Letter of Support for the 2015 RAP Status Update from the Lower Menominee River Citizen's Advisory Committee.

LOWER MENOMINEE RIVER REMEDIAL ACTION PLAN

Lower Menominee River Remedial Action Plan
Citizens Advisory Committee

The Lower Menominee River: A Great Lakes Area of Concern

6 September 2016

Michigan Department of Environmental Quality
Office of the Great Lakes
Richard Hobrla, AOC Program Manager
Constitution Hall 6 Floor, South Tower
525 West Allegan Street
Lansing, Michigan 48909-7973

Wisconsin Department of Natural Resources
Office of the Great Lakes
Kendra Axness, LAMP and AOC Coordinator
PO Box 7921
101 S Webster Street
Madison, Wisconsin 53703-7921

Dear Mr. Hobrla and Mrs. Axness,

The members of the Citizens Advisory Committee for the Lower Menominee River Area of Concern are writing to express our support for the *2015 Remedial Action Plan Status Report for the Lower Menominee River Area of Concern*. The Lower Menominee River Citizens Advisory Committee has been involved in development and review of the document and we consent to its findings and statements. We request your review and concurrence with our support of this document.

The CAC is composed of local concerned citizens, industry leaders, and governmental representatives representing varied and balanced viewpoints from Marinette, Wisconsin and Menominee, Michigan. We are tasked with assisting resource agencies with removing designated BUIs in the Lower Menominee River AOC. The CAC has provided local perspective and feedback into the development of this plan. We understand that the RAP is the primary document that will be used to track progress on BUI restoration, assessment, and removal, as well as describing the path for delisting the AOC.

If you have any questions please contact Mark Erickson Michigan CAC Co-Chair at 906-863-1954, or Keith West Wisconsin CAC Co-Chair at 715-735-4300 x4352.

Sincerely,

Mark Erickson, Michigan Co-chair

Keith West, Wisconsin Co-chair

C.C. Stephen Galarneau, WDNR
Victor Pappas, WDNR

Attachment D. Lower Menominee River AOC Sediment Remediation Sites Summary of Goals, Actions and Monitoring.

Site Name/ Contaminant of Concern	Media Type	Remediation Goals	Remedial Action	Remedial Action Implementation Status	Remediation Goal Met?	Monitoring and Maintenance
Ansul/Tyco (former Ansul Fire Protection) Arsenic	Terrestrial	Onsite Surface Soils ≤32 ppm Total Arsenic Adjacent Offsite Surface Soils 16 ≤ppm Total Arsenic	• 90,000 Tons of Salt Waste Removal • Limited Soil Removal • Capping	Complete	Verified 2015 • Construction Completion Report	Ongoing Maintenance & Monitoring • 2018 5-Year Review
	Ground Water	Containment & Flood Control	• Barrier Wall • Ground Water Extraction & Treatment System • Phyto Pumping Tree Plots	Complete	• 2010 • Yes, with management plan implementation	Ongoing Maintenance & Monitoring • Barrier Wall Ground Water Monitoring Plan 2015 Update • 2018 5-Year Review & Research new arsenic removal technologies
	Sediment	≤20 ppm Total Arsenic	• Dredge 300,056 CY • 12" Sand Cover Areas ≥ 20 ppm	Complete	Verified 2015 • Core Sampling • Pan Testing • Bathymetry	Ongoing Monitoring • Post Dredge Sand Cover Sediment Sampling 2018 • 2018 5-Year Review
Green Bay Paint Sludge (Lloyd Flanders, former Hayward-Wakefield) Heavy Metals	Sediment/Soil	Remove Paint Waste, Impacted Sediment & Soil and Install Shoreline Barrier	• Remove 5,000 Tons Bulk Paint Waste (hazardous waste facility) • Excavate 10,500 Tons Sediment & Soil (local landfill)	Complete	Reported volumes to MDNR 1995 & 1998 under Public Act 307.	Ongoing Implementation of Operations and Maintenance Plan
	Paint Nodules	Remove Paint Nodules that wash up along shoreline	• Collect & Remove Paint Nodules • Report under Admin Order	Ongoing	Verified Annually	Ongoing monthly and post storm events collection along shoreline
Menekaunee Harbor Heavy Metals & PAHs	Sediment	Threshold Effect Concentration (TEC) Values for Heavy Metals & Polynuclear Aromatic Hydrocarbons (PAHs)	• Dredge 27,129 CY • 6" Sand Cover Areas that exceed TEC for Metals.	Complete	Verified 2015 • Core Sampling • Pan Testing • Bathymetry	Not Required
Wisconsin Public Service Corporation (former manufactured gas plant) Coal Tar – PAHs	Terrestrial	Limited Soil Removal During Construction of Wastewater Treatment Plant & Road Construction.	• None at this Time • Developing Record of Decision (ROD)	Ongoing Evaluation	Removal documented & developing ROD to determine next steps.	Ongoing Maintenance & Monitoring
	Ground Water	Contamination plume defined	• None at this Time • Developing ROD	Ongoing Evaluation	Verified Feasibility Study Report 2016 ROD to determine next steps.	Ongoing monitoring
	Sediment	≤22.8 ppm 13 Priority PAHs	• Dredge 15,221 CY • 10" Sand Cover Areas ≥22.8 ppm • Reactive Core Mat (RCM)	Complete (Non-Time Critical Removal Action)	Verified 2013 & 2015 • Core Sampling • Bathymetry ROD to determine continuing obligations for Sand Cover & RCM.	Ongoing Maintenance & Monitoring • Reactive Core Mat • Sand Cover • 2018 5-Year Review

Table prepared by WDNR, June 2016