Grant Application

Grant Name - Water Quality Modeling of Lower Mississippi River WMO Priority Watersheds

Grant ID - C25-0205

Organization - Lower Mississippi River WMO

Allocation	Accelerated Implementation Grant 2025	**Grant Contact**	Joe Barten
Total Grant Amount Requested	$98,000.00	**County(s)**	Dakota,Ramsey
Grant Match Amount	$9,800.00	**12 Digit HUC(s)**	
Required Match %	10%	**Fiscal Agent**	Lower Mississippi River WMO
Other Amount		**Application Submitted Date**	08/22/2024
Project Abstract	The Lower Mississippi River Watershed Management Organization (LMRWMO) and its member cities seek to develop watershed-wide water quality modeling to identify and prioritize water quality improvement practices to maximize pollutant reduction benefits. With primarily urban and suburban landscapes, the LMRWMO estimates that much of pollutant load (i.e., phosphorus, sediment, chloride) reaching its lakes and streams occurs via stormwater runoff. However, without comprehensive water quality models, the absolute and relative amounts of pollutant loading from different portions of the watershed are unknown. This data gap limits the ability of the LMRWMO and its member cities to best allocate watershed-based implementation funding (WBIF) and other resources to achieve the most significant pollutant reductions and water quality improvements. This project includes the development and documentation of water quality models (using P8 or a GIS-based model) covering the watersheds tributary to Priority 1A and Priority 1B lakes and creeks in the LMRWMO. These include the watersheds tributary to: - Interstate Valley Creek - Ivy Falls Creek - Kaposia Creek (Simon’s Ravine) - Lake Augusta		

	- Hornbeam Lake - Rogers Lake - Seidls Lake (including the adjacent I-494 system) - Sunfish Lake - Thompson Lake These areas cover approximately 9,000 acres or 25 percent of the LMRWMO. Thompson Lake and Lake Augusta are currently listed as impaired for recreational use due to excessive nutrients. Water quality modeling will quantify estimated sediment and nutrient loading from the watershed and treatment achieved by existing best management practices. The study will identify pollutant loading "hot spots" on the landscape where future treatment maybe focused. The LMRWMO will use land use, land cover, and BMP information available during model development to semi-quantitatively assess chloride loading in the modeled watersheds. From the modeling results, the LMRWMO will characterize and prioritize treatment needs throughout the modeled watersheds. Analysis will include preliminary evaluation of treatment opportunities and recommended practices. This information will be used to inform future LMRWMO and member city management actions including: - design of LMRWMO- or city-led public BMP projects, - planning/prioritization of BMP maintenance by member cities - identification/pursuit of public-private partnership opportunities resulting from redevelopment, - review of private development/re-development proposals As part of the study, the LMRWMO and member cities will develop standards and best practices for the development of water quality models and determine a process to maintain and update the model(s) to promote their continued accuracy and effective uses. The modeling of priority lake watersheds is a first step. Over the life of its Plan, the LMRWMO seeks to extend this analysis to the entire watershed to achieve a more comprehensive understanding of pollutant loading and treatment.
Proposed Measurable Outcomes	Water quality models of priority watershed areas; report documenting model methods and results; documentation of modeling standards/best practices.

Narrative

****Required** MN Statute 16B.981 Subd. 2 (6) requires that no current principals of a grantee have been convicted of a felony financial crime in the last 10 years. A**

principal is defined as a public official, a board member, or staff (paid or volunteer) with the authority to access funds provided by this grant opportunity. By typing YES here, I attest that no current principal of my organization with authority to access funds has been convicted of a felony financial crime in the last 10 years.

YES

1.Does your organization have any active CWF competitive grants? If so, specify FY and percentage spent. Also, explain your organization's capacity (including available FTEs or contracted resources) to effectively implement additional Clean Water Fund grant dollars.

The Lower Mississippi River WMO has two active WBIF grants but no active CWF competitive grants.

2. Prioritization - Relationship to Plan (20 points): (A) List the specific local water management plan(s) and describe how it supports this proposal. Reference the document name, section, page number, and organization (if different than applicant). (B) List other relevant documents and describe how these documents support this project. Examples include: Total Maximum Daily Load (TMDL) Implementation Plans, Watershed Restoration and Protection Strategy (WRAPS) document, or Groundwater Restoration and Protection Strategy (GRAPS) document, the Minnesota Nutrient Management Strategy and others. (C) Provide web links to all plans referenced.

This project is identified in the LMRWMO 2023 Watershed Management Plan and is consistent with municipal stormwater-related goals and approaches of the Lake Pepin and Mississippi River Eutrophication TMDL Report.

A) LMRWMO Watershed Management Plan. The LMRWMO Plan implementation program (Section 5, Table 5-1, first page) specifically identifies this project as item S-7. Table 5-1 notes that this project supports the following LMRWMO Plan goals:

G1. Maintain or improve water quality in LMRWMO priority 1A and 1B lakes to meet applicable state standards or existing 10-year (2012 – 2021) summer average water quality, if better than state standards.

G2. Reduce sediment and phosphorus loading to the Mississippi River and priority 1A streams.

G4. Work with member cities to implement practices to minimize chloride use in the watershed.

G12. Reduce sediment loading to the Mississippi River.

Link: lmrwmo.org/wp-content/uploads/2023/04/2023-LMRWMO-Watershed-Management-Plan_Final.pdf

B) Lake Pepin and Mississippi River Eutrophication TMDL Report. Section 3.4.2 of the TMDL identifies runoff from municipal stormwater as a source of phosphorus leading to nutrient impairments. The TMDL (Section 5.2.2) assigns a phosphorus target of 0.35 lbs/acre/yr to LMRWMO member cities. TMDL Section 8.3.3 notes “the MPCA intends to allow MS4s flexibility in selecting and implementing approaches for demonstrating compliance with the target loading rate….Options include analyses of data from monitoring of outfalls and streams, modeling results, or a combination.”

This project will develop models LMRWMO member cities may use to demonstrate compliance with the target load, identify areas not achieving the target load, and identify projects to achieve the target load. Regardless of the target load, this project will promote projects that reduce sediment and phosphorus loading to the Mississippi River and Lake Pepin.

Link: https://www.pca.state.mn.us/sites/default/files/wq-iw9-22e.pdf

3. Targeting (20 points): Identify the water resource(s) that will benefit from targeted implementation efforts after these grant activities are completed. How will this project lead to more targeted implementation activities that protect or restore those water resource(s)?

This project will target the watersheds tributary to lakes and creeks classified as Priority 1A and Priority 1B in the LMRWMO 2023-2032 Watershed Management Plan – these are the two highest LMRWMO priority classifications and reflect the relative importance of these waterbodies to the LMRWMO and its member cities. The project includes areas tributary to:

- Interstate Valley Creek
- Ivy Falls Creek
- Kaposia Creek (Simon's Ravine)
- Lake Augusta
- Hornbeam Lake
- Rogers Lake
- Seidls Lake (including the adjacent I-494 system)
- Sunfish Lake
- Thompson Lake

Water quality modeling of these watersheds will identify pollutant loading "hot spots" and areas where existing treatment is minimal or non-existent. The LMRWMO and its member cities will use this information to target future structural and non-structural BMPs to achieve the greatest impact. In areas where opportunities for public BMPs are limited, the LMRWMO and member cities may target education, private cost-share (e.g., Landscaping for Clean Water), enhanced street sweeping, or other practices. Member cities may also use this information to identify areas where more rigorous technical review of development and redevelopment projects and/or coordination with developers can promote pollutant reductions.

Among the above waterbodies, Lake Augusta and Thompson Lake are impaired for aquatic recreation due to excessing nutrients. Project opportunities identified in these watersheds will have a direct impact on in-lake water quality. In addition, most of these watersheds are tributary to the Mississippi River and Lake Pepin; identification and implementation of projects throughout these watersheds will ultimately improve water quality in these downstream resources.

4. Targeting (5 points): Describe the proposed methods to be used to accelerate implementation of projects and practices that will ultimately improve or protect the targeted water resource.

Water quality modeling completed as part of this project will leverage the P8 model framework or GIS-based methods (similar to those previously developed for the City of Minneapolis and City of Richfield). Generally, this work includes:

- Characterizing land surface conditions using publicly available geospatial data (e.g., land use, soils).

- Characterizing existing stormwater management infrastructure, including existing BMPs.
- Running several years of precipitation data through the characterized watershed (using P8 models and/or GIS scripts).
- Calibrating the model(s) by reviewing results relative to observed data and/or expected results.
- Tabulating and mapping model results to document unit-area pollutant loading, percent pollutant removals, and other relevant parameters.
- Identifying locations where addition treatment or pollutant load reduction is most needed.
- Documenting and packaging completed models for continued use by the LMRWMO and member cities.

As part of this project, the LMRWMO will develop and document standards and best practices for development and use or water quality models. This will promote consistent use of models across the watershed.

5. Project Impact (25 points): A) Describe the proposed outcomes of this grant application. Describe how this grant will make implementation efforts more effective or efficient. Describe how the outputs will be either incorporated into the next water management or comprehensive plan amendment/revision or otherwise be incorporated into routine activities resulting in increased water quality protection or accelerated water quality restoration. B) Describe the benefits this proposal will provide from a local and/or state perspective. C) If applicable, describe how funds used for proposed staffing will be supported long-term.

A) The outcomes of this grant include water quality model(s) covering 25% of the watershed, a report documenting project results, and documentation of modeling standards/best practices.

Watershed-based implementation funding (WBIF) provides the LMRWMO opportunities to implement water quality projects. The LMRWMO and its partners will use water quality modeling to target areas of greatest need to use WBIF and other resources more efficiently and maximize benefits. The LMRWMO will add significant opportunities identified by modeling to its implementation program (during the next Plan update or by Plan amendment). The LMRWMO will use model results to identify priority areas on which future Plan development will focus (e.g., consideration of more stringent design standards or increased grant funding).

B) Local benefits. The LMRWMO and its partners will use the models to efficiently assess the benefits of potential projects and communicate with stakeholders when planning and implementing these projects. Member cities may use the models to support adding water quality BMPs to adjacent city projects (e.g., park improvements, road reconstruction). Member cities may use the model to support MS4-realted tasks like regulatory review of proposed projects or identification of stormwater ponds needing more frequent maintenance. Consistent modeling standards will also allow cities to pursue modeling efforts and direct developers consistent with LMRWMO-wide practices.

C) This project will be performed with consultant assistance. After the project, the LMRWMO will maintain the model(s) likely using the LMRWMO’s engineering budget. The LMRWMO will coordinate maintenance scope and schedule with member cities to balance efficiency and accuracy. LMRWMO and city roles will be detailed in the model standards/best practices.

6. Project Rationale (20 points): Why are these the most important and needed activities to implement at this time? Discuss alternatives considered and why those were not selected. How does this proposal complement other watershed work that you and your partners are conducting?

A consistent and comprehensive understanding of pollutant loading and treatment across the LMRWMO watershed is needed to promote the most beneficial use LMRWMO and member city resources to achieve the LMRWMO's water quality goals. The LMRWMO Watershed Management Plan recognized this knowledge gap and thus included this project as part of Plan implementation. The Plan listed this project as scheduled for 2027 – a schedule based on expected funding availability.

The accelerated implementation grant will allow this project to be completed on an earlier timeline. Early development of water quality models will allow the LMRWMO to focus its resources on the subwatersheds of greatest need starting now. This will allow more WBIF cycles to be focused on LMRWMO and partner projects of greatest impact. Expedited completion of this project may also allow the incorporation of additional water quality benefits into member city projects that would otherwise be completed without consideration of water quality needs.

The LMRWMO implementation program (Tables 5-1 and 5-2 in the LMRWMO Plan) does include other projects planned for 2023-2032. However, many of these are not eligible for CWF grant fundings (e.g., monitoring, water quantity focus) and others are coordinated with member city project implementation schedules. This project may be completed immediately was assistance from accelerated implementation grant funds.

This project complements recent LMRWMO work. In 2024, the LMRWMO is completing a study of areas with direct drainage to the Mississippi River. The direct drainages study evaluates project opportunities in about 25% of the watershed adjacent to the Mississippi River. This project addresses areas of the watershed not included in the Direct Drainages study. With the direct drainages study, this project will identify potential project locations in abouthalf of the LMRWMO watershed, including all areas draining to waters identified as LMRWMO Priority 1A and Priority 1B.

7. Timeline (5 points): Provide an anticipated timeline for completion of the proposed activities. Include steps taken or expected to ensure that the proposed activities can begin soon after the grant award and important project milestones.

The following presents, briefly, the project timeline:

Finalize scope and grant work plan: Spring 2025

Develop model standards/best practices: Summer 2025

Develop models: Summer 2025-Fall 2025

Revise models with partner input: Winer 2026

Document model results and methods: Spring 2026

8.The Constitutional Amendment requires that Amendment funding must not substitute traditional state funding. Briefly describe how this project will provide water quality benefits to the State of Minnesota without substituting existing funding.

This project will not substitute traditional state funding. A majority of funding sources are targeted towards capital improvements and do not allow modeling studies as an eligible practice/project for state grant funding. The LMRWMO implementation program included in Table 5-1 of the LMRWMO Watershed Management Plan originally identified Clean Water Fund competitive grants or watershed-based implementation funding (i.e., Amendment funding) as the primary funding for this project in conjunction with local match funds. This Accelerated Implementation Grant is consistent with that funding plan and does not substitute traditional state funding.

9.Please enter the dollar amount requested for CWP Loans. If you are not interested, indicate "not applicable".
not applicable
10.Please enter the dollar amount requested for Ag BMP Loan Program. If you are not interested, indicate "not applicable".
not applicable

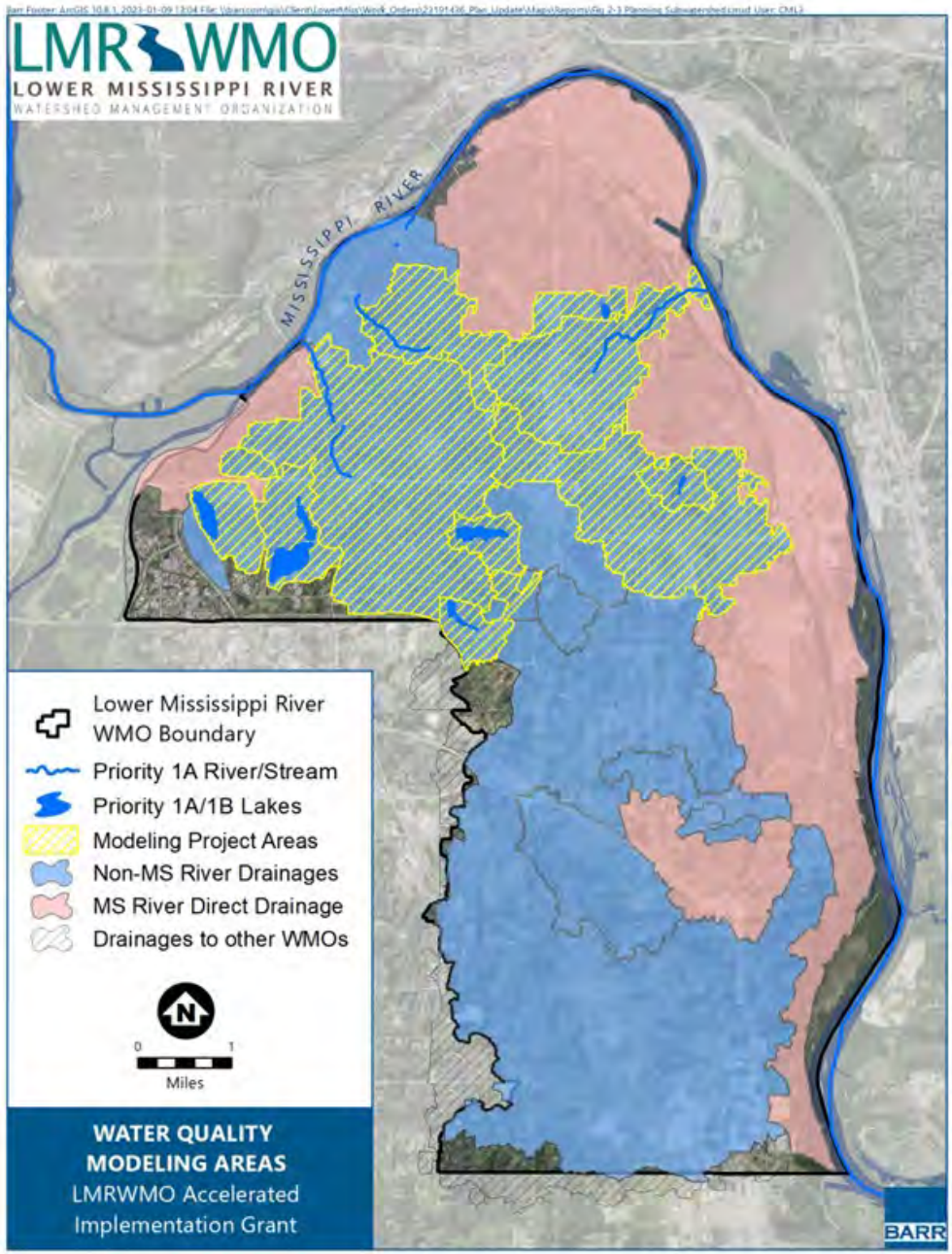
Application Budget

Activity Name	*Activity Description*	*Category*	*State Grant $ Requested*	*Activity Lifespan (yrs)*
Administration	LMRWMO contracted staff will manage the grant and provide overall administration of grant funds and local match requirements. This includes coordination with projects partners to ensure compliance with grant requirements. The LMRWMO will maintain financial and project records as appropriate and will follow website grant reporting requirements. This task also includes all grant reporting efforts, including communication with BWSR staff as necessary in administration of the grant, and development of project reporting. Program and project files will include appropriate documents as referenced in the BWSR Grants Administration Manual. Financial records will include all revenue and expenses associated with this grant, reporting of contracted labor via invoices, as well as other expenditures on projects.	Administration/Coordination	$7,000.00	
Develop modeling standards/best practices	This task includes working with the LMRWMO and member city staff to determine standards for water quality model development. This includes work at the beginning of the project to define the modeling approach and revisiting/revising the standards, if	Technical/Engineering Assistance	$5,000.00	10

Activity Name	*Activity Description*	*Category*	*State Grant $ Requested*	*Activity Lifespan (yrs)*
	necessary, at the end of the project.			
Developing water quality models of priority areas	This task includes developing water quality models. Subtasks may include: - Characterizing land surface conditions using publicly available geospatial data (e.g., land use, soils). - Characterizing existing stormwater management infrastructure, including existing BMPs. - Running several years of precipitation data through the characterized watershed (using P8 models and/or GIS scripts). - Calibrating the model(s) by reviewing results relative to observed data and/or expected results. - Tabulating and mapping model results to document unit-area pollutant loading, percent pollutant removals, and other relevant parameters. - Identifying locations where addition treatment or pollutant load reduction is most needed. - Documenting and packaging completed models for continued use by the LMRWMO and member cities.	Planning and Assessment	$80,000.00	10
Project Development	Coordination between project stakeholders to finalize the terms of implementation of this project and creation of a detailed scope of work for procurement of a feasibility study consultant, organizing stakeholder meetings to inform and coordinate with affected parties and the Cities involved, communication with project partners and stakeholders before, during, and after work	Project Development	$6,000.00	1

Activity Name	*Activity Description*	*Category*	*State Grant $ Requested*	*Activity Lifespan (yrs)*
	is undertaken, providing direction to feasibility study consultant on study details.			

Application Image

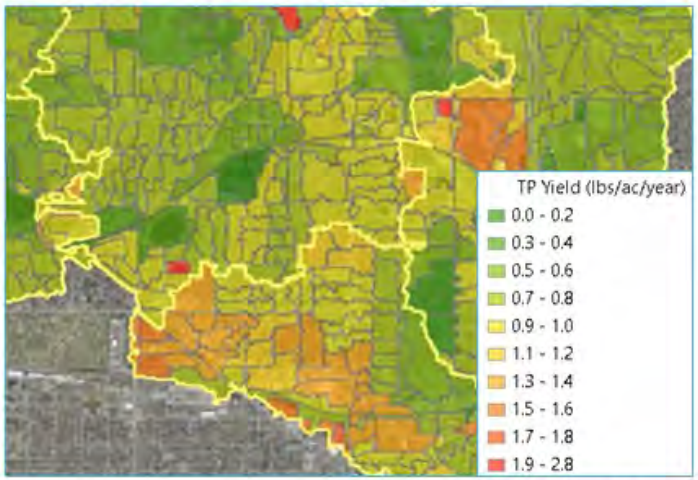


Water Quality Modeling of Lower Mississippi River WMO Priority Watersheds

The Lower Mississippi River Watershed Management Organization seeks accelerated implementation grant funding to develop water quality models for areas draining to waterbodies classified as Priority 1A and 1B (see map to left).

Water quality models will estimate watershed pollutant load and treatment (see example in inset below) . The LMRWMO and member cities may use the models to:

- Target and evaluate water quality improvements
- Identify BMP maintenance needs
- Evaluate development and redevelopment proposals
- Demonstrate TMDL compliance



Above: *An example of total phosphorus loading rates estimated from subwatersheds using a P8 water quality model.*

Left: *Map showing the subwatershed areas (~9.000 acres) for which the LMRWMO will develop water quality models as part of this project.*

BWSR

Grant Workplan
Watershed Based Implementation JAN 2023

Grant Title - 2023 - WBIF - Lower Mississippi River WMO
Grant ID - C23-4936
Organization - Lower Mississippi River WMO

Original Awarded Amount	$118,385.00	**Grant Execution Date**	
Required Match Amount	$11,838.50	**Original Grant End Date**	12/31/2025
Required Match %	10%	**Grant Day To Day Contact**	Joe Barten
Current Awarded Amount	$118,385.00	**Current End Date**	12/31/2025

Budget Summary

	Budgeted	Spent	Balance Remaining
Total Grant Amount	$118,385.00	$0.00	$118,385.00
Total Match Amount	$12,000.00	$0.00	$12,000.00
Total Other Funds	$0.00	$0.00	$0.00
Total	**$130,385.00**	**$0.00**	**$130,385.00**

**Grant balance remaining is the difference between the Awarded Amount and the Spent Amount. Other values compare budgeted and spent amounts.*

Budget Details

Activity Name	Activity Category	Source Type	Source Description	Budgeted	Spent	Last Transaction Date	Matching Fund
Administration	Administration /Coordination	Current State Grant	2023 - WBIF - Lower Mississippi River WMO	$8,000.00			N
LMRWMO Priority Watershed Project Identification and Watershed Model	Planning and Assessment	Current State Grant	2023 - WBIF - Lower Mississippi River WMO	$100,385.00			N

Activity Name	Activity Category	Source Type	Source Description	Budgeted	Spent	Last Transaction Date	Matching Fund
LMRWMO Priority Watershed Project Identification and Watershed Model	Planning and Assessment	Local Fund	Local Matching Funds	$12,000.00			Y
Project Development	Project Development	Current State Grant	2023 - WBIF - Lower Mississippi River WMO	$10,000.00			N

Activity Details Summary

Activity Details	Total Action Count	Total Activity Mapped	Proposed Size / Unit	Actual Size / Unit

Proposed Activity Indicators

Activity Name	Indicator Name	Value & Units	Waterbody	Calculation Tool	Comments

Grant Activity

Grant Activity - Administration	
Description	LMRWMO contracted staff will manage the grant and provide overall administration of grant funds and local match requirements. This includes coordination with projects partners to ensure compliance with grant requirements. The LMRWMO will maintain financial and project records as appropriate and will follow website grant reporting requirements. This task also includes all grant reporting efforts, including communication with BWSR staff as necessary in administration of the grant, and development of project reporting. Program and project files will include appropriate documents as referenced in the BWSR Grants Administration Manual. Financial records will include all revenue and expenses associated with this grant, reporting of contracted labor via invoices, as well as other expenditures on projects.
Category	ADMINISTRATION/COORDINATION
Has Rates and Hours?	Yes

Grant Activity - LMRWMO Priority Watershed Project Identification and Watershed Model	
Description	Combine existing GIS data to develop a water quality, hydrologic, and hydraulic model of priority watersheds. The modeling extent includes the watersheds of priority level 1A lakes (Thompson Lake, Rogers Lake, Seidls Lake). The modeling will identify pollutant loading hotspots, areas with insufficient or no treatment, and identify and prioritize regional treatment opportunities. Created from this information is a priority project list and feasibility analysis for each priority level 1A lake watershed, prioritizing projects that include water quality, volume reduction, and that also address flood risk. Water quality, hydrologic, hydraulic modeling will be used to design water quality improvement projects, evaluate flood mitigation opportunities, and identify areas where changing climate and regional development or redevelopment trends may exacerbate flooding, erosion, and pollutant loading. Activities may include watershed modeling, preliminary desktop mapping, cost benefit analysis, pollutant calculations, priority practice ranking, and a final report. Work to be performed by a qualified consultant, likely a licensed engineer through a water resources engineering consulting firm. Overall Measurable Outcome: The LMRWMO will have a water quality improvement and volume reduction project priority list of 10+ projects for the priority level 1A watersheds. The LMRMWO will have models to help identify, prioritize, design, and implement water quality improvement projects. Year 1 Milestones: Accomplish activities outlined in project development phase. Year 2 milestones: Have consultant under contract, site investigation and analysis underway and draft report in process. Year 3 Milestones: Complete final feasibility study for distribution to project stakeholders.
Category	PLANNING AND ASSESSMENT
Has Rates and Hours?	No

Grant Activity - Project Development	
Description	LMRWMO contracted staff will provide the following services in development of the water quality, hydrologic, and hydraulic model of priority watersheds: Coordination between project stakeholders to finalize the terms of implementation of this project and creation of a detailed scope of work for procurement of a feasibility study consultant, organizing stakeholder meetings to inform and coordinate with affected parties and the Cities involved, communication with project partners and stakeholders before, during, and after feasibility study is undertaken, providing direction to feasibility study consultant on study details. Approximate workload distribution within this activity: 40% stakeholder coordination, 60% consultant coordination. Year 1 Milestones: Hold two technical advisory stakeholder meeting to discuss project objectives. Discuss project objectives with LMRWMO Board. Year 2 milestones: Coordinate consultant selection and have consultant under contract, complete bulk of study by consultant. Year 3 Milestones: Complete oversight of final report submittal by consultant.
Category	PROJECT DEVELOPMENT
Has Rates and Hours?	Yes

Grant Attachments

Document Name	Document Type	Description
2023 WBIF-LMRWMO Revised Application	Grant	2023 - WBIF - Lower Mississippi River WMO
2023 Watershed Based Implementation Funding	Grant Agreement	2023 Watershed Based Implementation Funding - Lower Mississippi River WMO
Application	Workflow Generated	Workflow Generated - Application - 01/25/2023
Work Plan	Workflow Generated	Workflow Generated - Work Plan - 02/02/2023