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October 17, 2024

Ms. Katie Sommers, Director  
Bureau of Policy & Grants  
Wisconsin Emergency Management (WEM)  
PO Box 7865  
Madison, WI 53707-7865

Subject: 2024 Assessment Grant Application  
City of La Crosse, WI

Dear Ms Sommers:

## Applicant

Date:	October 17, 2024
Entity name:	Mead & Hunt, Inc.
Entity type:	Private Consultant
Contact name:	Andrew Skog, P.E.
Contact title:	Civil Engineer/Project Manager - Municipal
Contact address:	1702 Lawrence Drive, De Pere, WI 54115
Contact phone:	1-608-443-0546
Contact email:	<a href="mailto:Andrew.Skog@meadhunt.com">Andrew.Skog@meadhunt.com</a>
Alternate contact name:	Karen Wieneri, P.E.
Alternate contact title:	Project Manager – One Water
Alternate contact phone:	1-952-641-8810
Alternate contact email:	<a href="mailto:karen.wieneri@meadhunt.com">karen.wieneri@meadhunt.com</a>

Mead & Hunt, Inc. is applying on behalf of the City of La Crosse, WI. The City's contact is:

Name:	Tera Maldonado, CFM
Title:	Chronic Nuisance Technician/Floodplain Coordinator
Address:	400 La Crosse St., La Crosse, WI 54601
Phone:	1-608-789-8678
Email:	<a href="mailto:maldonadot@cityoflacrosse.org">maldonadot@cityoflacrosse.org</a>

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### Applicant Eligibility

The following makes this application eligible:

- The project area includes an area that has been the site of a presidentially declared disaster for flooding at any time in the 10 years preceding this grant application cycle. Disaster number and year: *DR-4288, 2016. DR-4343, 2017. DR-4402, 2018. DR-4459, 2019.*
- The project area includes an area that has previously been the site of a governor-issued state of emergency for flooding at any time in the 10 years preceding this grant application cycle. Year: *2018.*
- The applicant or local unit(s) of government on behalf of which this application is submitted has a current, Wisconsin Emergency Management (WEM)-approved hazard mitigation plan that identifies localized exposure to flood risk. Name and expiration date of plan (WEM can look up this information if you don't have it): *La Crosse County Wisconsin Multi-Hazards Mitigation Plan 2020-2024, La Crosse Flood Hazard Mitigation Plan 2022.*

### Certification

Attached as Appendix A are:

- Documentation demonstrating the City's authorization to participate in the grant program.
- Documentation demonstrating the City's commitment to expend funds for the grant project.
- Documentation demonstrating the City's commitment to fulfill all requirements of the program.

### Project Cost Estimate

Total project cost (100%):	<i>\$394,560.00</i>
State share percent (maximum 75%):	<i>75%</i>
State share amount (maximum \$300,000):	<i>\$295,920.00</i>
Applicant share percent (minimum 25%):	<i>25%</i>
Applicant share amount:	<i>\$98,640.00</i>
Source(s) of applicant share of funding:	<i>Local</i>

### Project Title and Description

Project title: La Crosse River Floodplain Analysis

Before making improvements to the City's flood protection system, it is essential to conduct a thorough assessment of the La Crosse River's flood levels. This initial evaluation will not only assess the

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City's vulnerability to flooding from the La Crosse River but also lay the groundwork for floodplain remapping.

## Detailed Description of the Problem

The La Crosse River could contribute to flooding within the City, especially for the North Side district of the City. Through the City, the La Crosse River floodplain is quite broad and comprised of a meandering river channel, drainage ditches, and marshlands all being crossed by numerous roadways, trails, and railroad embankments. A "natural levee" has also formed along the southern bank for portions of the reach. In addition, the confluence with the Mississippi River can lead to significant backwater effects when the Mississippi River levels are high.

For these reasons, flooding conditions along the La Crosse River are very complex and there is a concern that the current floodplain analysis used for the effective FEMA Flood Insurance Rate Maps (FIRMs) is outdated and not accurately representing flood levels along the La Crosse River.

Reanalyzing the La Crosse River floodplain is crucial because the maps may not reflect recent changes in land use and topography. Advancements in technology and data collection methods, such as LiDAR and GIS, allow for more precise and accurate floodplain mapping compared to the effective floodplain analysis for the La Crosse River. Having an accurate representation of the flood levels along the La Crosse River is essential for effective flood risk management, helping the City plan and implement mitigation strategies to reduce flood damage and enhance resilience.

Analyzing the La Crosse River will allow the City of La Crosse to make informed decisions regarding flooding. This information can lead to changes that can save public and private property in the future, reduce utility damage, and lower response costs. Reanalyzing the floodplain is crucial as the current data is aging. With the updated analysis, the flood risk assessments will be based on the most current and comprehensive data, which will lead to better protection of the health and safety of citizens as well as their property.

The City has evaluated key riverine flooding issues, which have plagued the city, damaged public and private infrastructure, and stressed the overall economic and social strengths of the community. These flood risks are identified in the SEH (2022) *City of La Crosse Flood Hazard Mitigation Plan*. The La Crosse River is called out in the La Crosse County Multi-Hazards Mitigation Plan 2020-2024 as being high risk when it comes to flash flooding on page 3-1. Additionally, the plan estimates that in a 100-year flood event, the City of La Crosse could experience \$28,075,155.00 in damages.

## Project Scope of Work and Outcomes

The La Crosse Floodplain study will involve conducting an updated detailed floodplain study to determine the extent of flooding during the 100-year event, and to map the corresponding 100-year floodplain boundaries. La Crosse has been part of several flood-related disaster declarations in the last decade, and it is clear updated data is needed for this area. The current floodplain modeling for the La Crosse River uses outdated methods for computing the 100-year flood elevations along the river. A revised study represents the first step toward improved and coordinated flood protection for the city. The tasks for this study and deliverables include:

*Task 1. Topographic Survey*

Due to the anticipated extents of the project area and the accuracy needs, Mead & Hunt, Inc. (Mead & Hunt) will mobilize a team to survey key features within the study area using both a total station and a GPS rover. Before survey work can begin, Mead & Hunt will obtain the necessary permits to complete the survey on BNSF property.

A total station will be used to set control points throughout the study area and to survey the dimensions of relevant infrastructure. Mead & Hunt will begin by establishing survey control points. After establishing control points, Mead & Hunt will perform the survey collecting: high water marks on structures; existing infrastructure such as culverts, bridges, stormwater infrastructure and ditches; and other pertinent information required to fully define the hydraulic characteristics of the La Crosse River floodplain and surrounding study area.

Information collected without survey equipment will include length, width, and height of bridge conveyance areas; vertical distance from bridge bottom chords to top of road or railroad bed; sketches and measurements of bridge wingwall configuration; water surface elevation at the time of survey; debris accumulation; and other pertinent data. Mead & Hunt will also take photos of relevant infrastructure and natural features.

*Task 2. Bathymetric Survey*

The bathymetric survey field activities will be performed by J.F. Brennen Company, Inc. (Subcontractor) from La Crosse, Wisconsin. The survey area encompasses the La Crosse River stretching from just upstream of Highway 16 to its confluence with the Mississippi River/Black River near Riverside Park. The survey area will also include the marsh areas adjacent to the La Crosse River and some secondary channels throughout the floodplain. The Subcontractor will utilize a single-beam echo sounder mounted onboard a shallow draft survey vessel to perform the hydrographic survey. The survey will be conducted as close to shore as feasible without risking safety or damaging equipment. Upon completion of the field work, the Subcontractor will provide gridded and/or un-gridded XYZ sounding data (point file), contours in AutoCAD format, plan view mapping as a PDF file, triangular irregular networks (TIN) surface, and a report containing methods and data overview.

*Task 3. Hydrology*

Mead & Hunt will develop hydrology for the study using peak flows published in the effective Flood Insurance Study (FIS). These include the 10-, 50-, 100-, and 500-year recurrence interval flood events. No hydrologic calculations or analysis will be performed to compute the peak flows. Inflow hydrographs will be developed by scaling a hydrograph recorded at the U.S. Geological Survey (USGS) stream gage along the La Crosse River (USGS gage no. 05383075) for a chosen recent high flow event.

*Task 4. Develop Model – 2D Hydraulic Model*

Mead & Hunt will build a 2-dimensional (2D) hydraulic model of the La Crosse River floodplain. A 2D model is most appropriate because the study area involves expansion of flood flows over wide floodplains, and flows along the floodplains are impeded by various structures. More specifically, the

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2D capabilities of HEC-RAS (Hydrologic Engineering Center – River Analysis System) will be used for the hydraulic modeling using an unsteady-state analysis. The most current, non-beta version of HEC-RAS available at the time of the work onset will be used for the analysis.

The 2D HEC-RAS model will extend from just upstream of Highway 16 to the confluence with the Mississippi River. The modeled area will include the expansive marsh areas within the floodplain and the North Side district of the city to analyze the potential overflows into the city. Mead & Hunt will use light detection and ranging (LiDAR) and the bathymetric survey data collected as the base terrain data and use the model tools to create a 2D computational mesh. Mead & Hunt will then add the infrastructure features (e.g., bridges and culverts) to the model based on record drawings and/or field survey data. Details of channel and floodplain roughness will also be added. The hydraulic model will be calibrated if adequate information or data are available from previous flood events.

The 2D hydraulic model will be used to route the 10-, 50-, 100-, and 500-year flood event hydrographs through the La Crosse River and wetland/floodplain complex. The developed hydrology will provide model input for various flood scenarios, and a downstream boundary condition will be established based on an assumed elevation of the Mississippi River that matches that used for the effective FIS. The model results will be used to develop flood profiles of the peak water surface elevations along the river for each of the modeled flood events. Mead & Hunt will develop maps to show the maximum inundation extents for the 100-year event within the modeled area. Maps will also be developed to compare the modeled 100-year inundation to the currently mapped regulatory floodplain.

*Task 5. Findings Report*

Mead & Hunt will write a draft and final report to document the methodology used for development of the 2D hydraulic model and present the results of the analyses, including the comparison maps to the currently mapped floodplain. The report will be developed with the intent that results of the analyses are for the City's use.

*Task 6. Meetings and Project Management*

Mead & Hunt will make a virtual presentation of findings from the study to the City Council. Project management responsibilities include internal staff coordination, task and budget tracking, and maintaining regular communication with the City to communicate project status and address any concerns.

The following deliverables will be provided.

Summary of meeting notes collected by Mead & Hunt staff .....	electronic copies
Bathymetric Survey report and data from J.F. Brennan .....	electronic copies
Data and survey information of existing infrastructure .....	electronic copies and photos
Draft of the Findings Report for review by the City .....	1 electronic copy
Final copy of the Findings Report .....	1 electronic copy
Hydraulic Model Files .....	1 electronic copy

The ideal long-term outcome will be for this data to be used in both the County Hazard Mitigation Plan as well as the La Crosse Flood Hazard Mitigation Plan 2022. This data will be able to support

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potential flood mitigation priorities in the future and allow for better public education on the local flood hazards. The City of La Crosse is a high-risk area for flooding and has been impacted by several disaster declarations in the last decade. This study will assist La Crosse in prioritizing mitigation projects in the future. The La Crosse Flood Hazard Mitigation Plan 2022 has several goals that would benefit from this study including evaluate adapting and expanding parks for flood storage which could be submitted under an implementation project in the future.

## Project Location

Attached as Appendix B is the project area map. Also attached as Appendix B, is the project area flood insurance rate maps. The La Crosse River is part of the Little La Crosse River and Lower La Crosse River watersheds. Both watersheds contain wooded hillsides, agricultural fields, and steep bluffs. The Lower La Crosse River watershed contains the major population center for the Bad Axe – La Crosse River basin. Central coordinates for the study area: 43.842193, -91.229956.

The following table lists Flood Map products for the area of interest within the City from FEMA's Flood Map Service Center.

	Panel Number	Effective Date
<b>Current Effective FIRM Panels</b>	55063C0234D, 55063C0253D, 55063C0254D, 55063C0251D, 55063C0252D,	1/6/2012

The City of La Crosse is in the Wisconsin's 32nd State Senate district; Wisconsin's 95th Assembly district; and Wisconsin's 3rd Congressional district.

## Budget

Below is a breakdown of cost elements for the Project. Attached as Appendix C is the Amendment prepared by Mead & Hunt for the project work.

<b>2D HYDRAULIC MODEL</b>				
Task	Task Description	Labor	Expenses	Cost
1	Topographic Survey	\$ 83,790.00	\$ 15,780.00	\$ 99,570.00
2	Bathymetric Survey	\$ 10,900.00	\$ 137,800.00	\$ 148,700.00
3	Hydrology	\$ 7,420.00		\$ 7,420.00
4	Develop Model	\$ 60,470.00		\$ 60,470.00
5	Findings Report	\$ 40,290.00		\$ 40,290.00
6	Meetings and project coordination	\$ 35,830.00	\$ 2,280.00	\$ 38,110.00
<b>Total Project</b>		<b>\$ 238,700.00</b>	<b>\$ 155,860.00</b>	<b>\$ 394,560.00</b>

## Cost Effectiveness

Conducting a floodplain analysis along the La Crosse River is a crucial tool for mitigating flood risks and achieving substantial long-term savings. By preventing flood damage and reducing the need for emergency response and recovery efforts, this analysis can significantly lower costs for a flood fight.

The project will identify areas at high risk of flooding, allowing the City to better plan and implement effective flood mitigation measures. This approach can lead to reduced property damage, lower insurance costs, and minimal economic disruption.

Effective floodplain management offers long-term benefits, including protection of the community, preservation of natural habitats, and maintenance of the floodplain ecology. By investing in the analysis and subsequent mitigation measures, the City of La Crosse can avoid the high costs associated with flood recovery and rebuilding. Thus, the floodplain analysis is a cost-effective strategy for managing flood risk.

The City has authorized Mead & Hunt to begin gathering official modeling analysis data used for the effective floodplain mapping from FEMA's Engineering Library. The official modeling/analysis used for the effective floodplain mapping will provide a clearer understanding of how the current floodplain limits were established. However, the initial cost for this work has not been included in the project cost estimate, nor the City's contribution to this project.

## Work Schedule

The table below provides the proposed project work schedule, including the start and end dates for each task within the scope of work. The project is expected to take approximately one year, with an estimated completion date of October 31, 2025.

Task	Task Description	Begin Date	End Date
1	Topographic Survey	February 3, 2025	April 25, 2025
2	Bathymetric Survey	March 1, 2025	March 31, 2025
3	Hydrology	April 7, 2025	May 2, 2025
4	Develop Model	May 5, 2025	August 29, 2025
5	Findings Report	June 2, 2025	October 31, 2025
6	Meetings and project coordination	February, 2025	October 31, 2025

## Environmental Considerations

There is no environmental or historic preservation information included, and no special studies are required for this floodplain analysis.

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If you have any questions or require additional information, please contact me.

Sincerely,

MEAD & HUNT, Inc.

Andrew Skog, PE

Civil Engineer/Project Manager - Municipal

Attachment

cc: Tera Maldonado, City of La Crosse