

**Environment and Natural Resources Trust Fund**

# 2021 Request for Proposal

## **General Information**

**Proposal ID:** 2021-376

**Proposal Title:** St. James Pit Water Level Control

## **Project Manager Information**

**Name:** Becky Lammi

**Organization:** City of Aurora

**Office Telephone:** (218) 229-2614

**Email:** cityclerk@ci.aurora.mn.us

## **Project Basic Information**

**Project Summary:** The St. James Pit Rising Water Levels Study, Mitigation, and Diversion Plan

**Funds Requested:** $305,000

**Proposed Project Completion:** 2022-06-30

**LCCMR Funding Category:** Water Resources (B)

## **Project Location**

**What is the best scale for describing where your work will take place?** Region(s): NE

**What is the best scale to describe the area impacted by your work?** Region(s): NE

**When will the work impact occur?** During the Project and In the Future

## **Narrative**

**Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.**

The St. James Pit is an old, abandoned Iron Ore Mine within the City of Aurora. It is not subject to new mining mitigation rules due to its operation many years ago before rules were in place. The City receives its drinking water from this mine and has a pumping station near it. The City, along with neighboring communities, have decided to switch to another source of water, and therefore Aurora will stop pumping water from the St. James Pit. The water level will rise--estimated to rise 33 feet. The consequences may be water discharge via a surface outlet that needs to be developed, the St. James pit walls will destabilize, aquifer water levels will rise promoting basement flooding, and unintended surface water discharges will occur. The proposal seeks to develop a plan to address these problems using scientific data and analysis.

**What is your proposed solution to the problem or opportunity discussed above? i.e. What are you seeking funding to do? You will be asked to expand on this in Activities and Milestones.**

It is proposed that 14 well installations be developed that will allow the collection of groundwater elevation data, which will be used to determine groundwater flow directions, hydraulic gradients, aquifer parameters, and other data to be used in modeling. The modeling will determine the potential outflow rates at different water elevations to aid in engineering and design of the potential outlet. The data collected from the wells, pit water levels data, and precipitation data would go into the modeling effort. An important component of the project will be the Pit Wall Stability study to assess the mechanisms and safety factors assoicated with the ability of natural and human altered earthen materials to address pit wall stability throughout the potential range of pit water levels. The Wet Basement Study is to determine the potential for wet basements in the City to occur depending on the water elevations in the pit. This will be done by using the well information to determine current water levels in the surgical sediments and collecting information from homeowners . These studies will determine the outflow management plan in the future.

**What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state’s natural resources?**

These efforts will protect, preserve, conserve and enhance the water quality of the St. James Pit, the aquifer,and the discharge into the local river as well as fish populations who enjoy these waters. It is targeted especially to these waters and the pit that was substantially impaired. This effort will provide strategies that include citizens and the community in these scientific efforts. It is specifically designed to mitigate the impacts resulting from artificial hydrological modifications and it effects the drinking water of the community. The outflow work will prevent and reduce the levels of potential contaminants in surface waters.

## **Activities and Milestones**

### **Activity 1: Well Installation And Monitoring**

**Activity Budget:** $250,000

**Activity Description:**This activity consists of installing 4 bedrock wells and 10 surficial wells to collect groundwater elevation data in the City of Aurora. The data will be used to determine groundwater flow directions, hydraulic gradients and aquifer parameters used in modeling and needed studies. The purpose of the modeling is to determine the potential outflow rates at different water elevations to aid the engineering design of the potential outlet. The data collected from all of the wells, pit water levels data, precipitation data, etc. would be integrated into the modeling effort.

**Activity Milestones:**

|  |  |
| --- | --- |
| **Description** | **Completion Date** |
| Water Modeling Completed | 2022-06-30 |
| Well Installation Completed | 2022-06-30 |

### **Activity 2: Pit Wall Stability and Wet Basement Studies**

**Activity Budget:** $55,000

**Activity Description:**The pit wall stability study will access the mechanisms and safety factors associated with the ability of natural and human altered earthen materials (glacial drift and assorted fill associated with past mining operations) to address pit wall stability throughout the potential range of pit water levels. Identify the possible mechanisms of uncontrolled outflow from each of the target locations. Determine the factors of safety for a range of water elevations at a number of locations identified for modeling that pose the greatest threat to public safety. The wet basement study will determine the potential for wet basements to occur depending on water elevations in the pit. By using the well information to determine current water levels in the surficial sediments and collecting information from homeowners basement elevations.

**Activity Milestones:**

|  |  |
| --- | --- |
| **Description** | **Completion Date** |
| Wet Basement Study Completed | 2022-06-30 |
| Pit Wall Stability Study Completed | 2022-06-30 |

## **Project Partners and Collaborators**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Organization** | **Role** | **Receiving Funds** |
| Doug Gregor | East Range Joint Powers Board | Coordinates the joint efforts of the surrounding communities to identify and implement an alternative community water supply and support the studies. | No |
| Hydrological Services Firm | Firm To Be Selected On A Qualifications Process | Responsible for the completion of the well installation, modeling, pit wall stabilization study and wet basement study | Yes |
| Chris Ismil | Department of Iron Range Resources and Rehabilitation | Project co-funder | No |
| Michael Liljegren | Division of Lands and Minerals, Minnesota Department of Natural Resources | Michael Liljegren, the Supervisor of Mine Permitting and Coordination Section, will coordinate the project with the City Clerk and supervise the modeling, well installation, Pit Wall stability Study, and Wet Basement Study. | No |

## **Long-Term Implementation and Funding**

**Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this be funded?**The results will determine the outflow discharge and the need for pit wall stabilization to prevent harm to the community and adjacent waters and aquifer. The City and the DNR will report the findings to the Minnesota Legislature and seek funding from the State and other sources including Section 569 program of the Army Corps of Engineers for the implementation of the long-term plan to control the water levels. Project results will also be reported to our collaborating partners and the community.

## **Other ENRTF Appropriations Awarded in the Last Six Years**

|  |  |  |
| --- | --- | --- |
| **Name** | **Appropriation** | **Amount Awarded** |
| County Geologic Atlases - Part B, Mapping Aquifer Hydrology | M.L. 2019, First Special Session, Chp. 4, Art. 2, Sec. 2, Subd. 03o | $2,400,000 |

## **Project Manager and Organization Qualifications**

**Project Manager Name:** Becky Lammi

**Job Title:** City Administrator/Clerk-Treasurer

**Provide description of the project manager’s qualifications to manage the proposed project.**City Administrator - assists in managing all construction, water, and waste water projects in the City of Aurora limits. Works in conjunction with project managers, construction managers, and the Public Works Director.

**Organization:** City of Aurora

**Organization Description:**Aurora is a city in Northeastern Minnesota on the east end of the Mesabi Iron Range. It has a long and proud tradition of iron ore mining and forestry as its basic industries. We are proud to be home of the Mesabi East school system, which also serves the towns of Biwabik, Biwabik Township, Town of White, and the City of Hoyt Lakes. The city is capably run by our Mayor, Council, and excellent employees. 1,636 people live in Aurora.

## **Budget Summary**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Category / Name** | **Subcategory or Type** | **Description** | **Purpose** | **Gen. Ineli gible** | **% Bene fits** | **# FTE** | **Class ified Staff?** | **$ Amount** |
| **Personnel** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
| **Contracts and Services** |  |  |  |  |  |  |  |  |
| Hydrological Service Firm Hired Through A Qualifications Process | Professional or Technical Service Contract | This firm will install the wells, conduct the modeling/ monitoring and will complete the pit wall stabilization and wet basement studies |  |  |  | 4 |  | $305,000 |
|  |  |  |  |  |  |  | **Sub Total** | **$305,000** |
| **Equipment, Tools, and Supplies** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
| **Capital Expenditures** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
| **Acquisitions and Stewardship** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
| **Travel In Minnesota** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
| **Travel Outside Minnesota** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
| **Printing and Publication** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
| **Other Expenses** |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | **Sub Total** | **-** |
|  |  |  |  |  |  |  | **Grand Total** | **$305,000** |

### **Classified Staff or Generally Ineligible Expenses**

|  |  |  |  |
| --- | --- | --- | --- |
| **Category/Name** | **Subcategory or Type** | **Description** | **Justification Ineligible Expense or Classified Staff Request** |

### **Non ENRTF Funds**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Category** | **Specific Source** | **Use** | **Status** | **Amount** |
| **State** |  |  |  |  |
|  |  |  | **State Sub Total** | **-** |
| **Non-State** |  |  |  |  |
| Cash | Grant from the Department of Iron Range Resources and Rehabilitation | For the same purposes in the LCCMR application | Pending | $305,000 |
|  |  |  | **Non State Sub Total** | **$305,000** |
|  |  |  | **Funds Total** | **$305,000** |

## **Attachments**

### **Required Attachments**

#### ***Visual Component***

File: [a08b83e4-f2a.pdf](https://lccmrprojectmgmt.leg.mn/media/map/a08b83e4-f2a.pdf)

#### ***Alternate Text for Visual Component***

Map of project area.

#### ***Board Resolution or Letter***

|  |  |
| --- | --- |
| **Title** | **File** |
| Council Resolution | [6090313d-3dd.docx](https://lccmrprojectmgmt.leg.mn/media/attachments/6090313d-3dd.docx) |

## **Administrative Use**

**Does your project include restoration or acquisition of land rights?**   
 No

**Does your project have patent, royalties, or revenue potential?**   
 No

**Does your project include research?**   
 Yes

**Does the organization have a fiscal agent for this project?**   
 No