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. Ineligible	% Benefits	# FTE	Classified 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

Alternate Text for Visual Component

Map of project area.

Board Resolution or Letter

Title	File
Council Resolution	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?

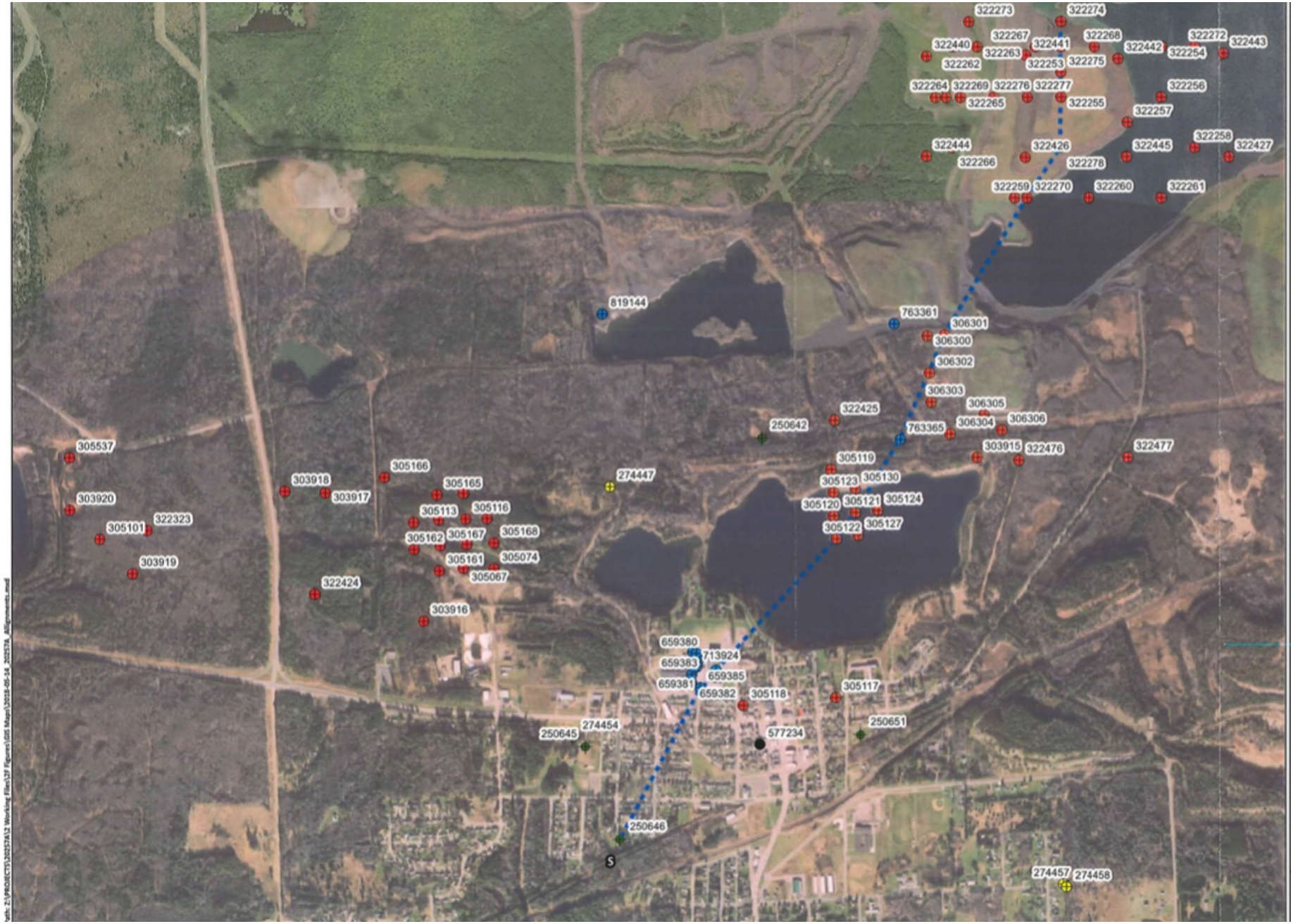
No

Does your project include research?

Yes

Does the organization have a fiscal agent for this project?

No



0 550 1,100 2,200

Feet

1 Inch = 1,153 Feet

Legend

- Monitoring_Wells
- Exploration_Wells
- Scientific_Investigation_Wells
- Test_Wells
- Elevator_Wells
- N-S Allignment

Figure 1
Cross Section Allignment

Hydrogeology Study
Aurora, MN (St. Louis)

Date Drawn :
July 6, 2018
Drawn By :
AM