



# Environment and Natural Resources Trust Fund

## 2021 Request for Proposal

### General Information

**Proposal ID:** 2021-082

**Proposal Title:** Aggregate Resource Mapping of St. Louis County

### Project Manager Information

**Name:** Heather Arends

**Organization:** MN DNR - Lands and Minerals Division

**Office Telephone:** (651) 259-5376

**Email:** heather.arends@state.mn.us

### Project Basic Information

**Project Summary:** DNR will map aggregate resources in St. Louis County to support ENRTF and transportation projects. Aggregate maps provide information essential to land-use planning and stewardship of Minnesota's natural resources.

**Funds Requested:** \$767,000

**Proposed Project Completion:** 2024-06-30

**LCCMR Funding Category:** Foundational Natural Resource Data and Information (A)

### 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?**

In the Future

## Narrative

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

Minnesota's environment and recreation infrastructure relies on the same aggregate resources as our roads, bridges, and buildings. Since 1991, ENRTF funded at least 1,000 miles of new and reconstructed trails, 28 bridges, 2 interpretive centers, and 12 new water access sites. ENRTF projects that restore shorelines, produce clean energies, and make the outdoors ADA accessible also consume aggregates.

The United States Geological Survey approximates that the delivered price of sand and gravel aggregate doubles at 23-miles. In Minnesota, some projects travel more than twice this distance because local aggregate deposits are depleted or unknown. Aggregate availability is strained in many parts of the State due to natural, geological scarcity of aggregate resources. These emerging trends not only increase the cost of publicly funded projects, they also increase the carbon footprint of every transportation, environment, and recreation construction project.

St. Louis County is working to balance a limited supply of quality aggregate and a growing need for road and bridge maintenance, septic system installation, and outdoor recreation development. This is an opportunity to provide local planners and elected officials the foundational natural resource information needed to enhance Minnesota's air, water, wildlife, and other natural resource infrastructure.

### **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.**

Similar to how groundwater maps inform decisions about sustainable water use, aggregate resource maps inform decisions about the impacts of developing, or not developing, a potential resource. In this proposal, the DNR's Aggregate Resource Mapping Program (ARMP) will identify and characterize aggregate resources in St. Louis County, and make this information widely available so that all users of aggregates are better equipped to protect, conserve, preserve, and enhance the State's natural resources. The St. Louis County Board of Commissioners passed a resolution requesting this work in 2004, and the waitlist for aggregate mapping is growing with seven new counties passing resolutions in the last year.

Directed by Minnesota Statute §84.94, DNR provides aggregate resource information to local governments and the public. This proposal is consistent with final recommendations of the 2017 Aggregate Resources Task Force to fund DNR's ARMP, so that maps can be available for entire State. ARMP uses a combination of remote sensing interpretation, geologic fieldwork, and GIS analysis to inventory aggregate resources. Our aggregate maps and associated GIS data can be layered with other planning tools to support:

- land use decisions,
- resource protection,
- transportation and other infrastructure planning, and
- land and asset management.

### **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?**

DNR produces technical, yet easy to understand, county-scaled aggregate maps. Our maps help a variety of users know the location and quality of aggregate sources, so they have best-available information in their toolbox. For this reason, the Minnesota Association of County Planners and Zoning Administrators supported ARMP in their 2019 Legislative platform.

St. Louis County is home to diverse ecological, recreational, and economic resources. "To better protect and conserve

our cherished natural resources, we need a full understanding of our landscape. A county aggregate map is one tool we're missing." - Keith Musolf, St. Louis County Commissioner (5th District)

## Activities and Milestones

### Activity 1: Aggregate Mapping

**Activity Budget:** \$767,000

**Activity Description:**

DNR geologists use county-scale geologic mapping techniques to identify sand, gravel, and crushed stone resources and characterize their relative quality. This information is foundational to natural resource stewardship and used by local governments and the public.

The aggregate mapping process includes:

1. Compiling and evaluating gravel pit data, historic geologic information, GIS datasets, and remotely sensed layers (e.g. LiDAR).
2. Conducting fieldwork to describe and analyze deposits, survey gravel pits and bedrock quarries, and collect geologic observations.
3. Drafting aggregate resource potential maps based on office and field-based data, facilitating technical peer review, and gathering public comment.
4. Publishing county-specific data products including free GIS data packages, countywide PDF maps, and interactive aggregate map services.
5. Co-Sponsoring a workshop with local partners to educate users how to apply project data to local resource stewardship.
6. Continuing to provide technical support to counties, elected officials, and the public on aggregate resource planning, permitting, and reclamation topics.

DNR’s Aggregate Resource Mapping Program coordinates with Minnesota Geologic Survey and Minnesota Department of Transportation, as well as St. Louis County and local partners, to produce geologically accurate and publically accessible maps and information.

**Activity Milestones:**

Description	Completion Date
Compile St. Louis County geologic data while finalizing ENRTF projects (Swift & Sibley aggregate maps).	2021-07-31
Conduct fieldwork, collect field observations, inventory active, inactive, and reclaimed pits/quarries, and collect samples.	2023-10-31
Digitize draft lines and mapping units within the county.	2023-12-31
Host local workshop and release final data to the county and other users.	2024-06-30
Complete and publish aggregate resource maps for St. Louis County.	2024-06-30

## Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Julie Marinucci	St. Louis County Land and Minerals Department	Project partner and co-sponsor of final aggregate resources workshop when project is complete. Will provide in kind services geologic sample analyses.	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?**

Project results and associated data are published in portable document format, interactive web map, GIS files, and print. Digital files are available for download on DNR's website and Minnesota Geospatial Commons. Any member of the public may request a map, free of charge.

DNR will co-sponsor an aggregate workshop with St. Louis County, so that staff and any other interested parties, can learn how to apply project data to local resource stewardship. DNR will also present all final products to St. Louis County Commissioners. After the final data release, no additional funding is required.

## Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Accelerated Aggregate Resource Mapping	M.L. 2019, First Special Session, Chp. 4, Art. 2, Sec. 2, Subd. 03h	\$700,000

## Project Manager and Organization Qualifications

**Project Manager Name:** Heather Arends

**Job Title:** Manager of Mineral Potential Section

**Provide description of the project manager's qualifications to manage the proposed project.**

Heather Arends is a 20 year employee of the Department of Natural Resources and currently manages the Mineral Potential Section. This section is responsible for the stewardship of the state's 12 million acre mineral interests. Her previous responsibilities included supervising the Aggregate Resource Mapping Program where she oversaw the successful completion of half of the counties mapped by the DNR. She received a B.A. in Geological Science from the University of Minnesota, Morris and working to complete an M.S. in Geological Sciences from the University of Minnesota, Duluth.

**Organization:** MN DNR - Lands and Minerals Division

**Organization Description:**

The mission of the Minnesota DNR is to work with citizens to conserve and manage the state's natural resources, to provide outdoor recreation opportunities, and to provide for the commercial uses of natural resources in a way that creates a sustainable quality of life.

The Division of Lands and Minerals works to provide exceptional real estate and mineral expertise to enhance

Minnesota's future uphold strong environmental protections and support our economy by demonstrating the highest professional standards.

## Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
<b>Personnel</b>								
2 Geologists		Produces aggregate maps (Research Scientist 2)			28%	4.5		\$429,180
Program Coordinator		Supervises project implementation (State Program Coordinator)			28%	1.5		\$176,420
GIS Technician		Manages GIS data and cartography (Research Analysis Specialist Senior)			28%	0.56	X	\$59,890
Technician		Supports data compilation and sampling analysis (Student Worker)			28%	0.5		\$20,000
							<b>Sub Total</b>	<b>\$685,490</b>
<b>Contracts and Services</b>								
							<b>Sub Total</b>	-
<b>Equipment, Tools, and Supplies</b>								
	Equipment	Equipment is used from previous survey periods when possible (e.g. drilling equipment, hand augers, lab equipment, safety gear and equipment, etc.) but replaced, repaired, or updated as necessary.	Necessary for field portion of aggregate mapping process.					\$3,000
	Tools and Supplies	Expendable field supplies such as batteries, sample bags, field notebooks, field utensils, etc.	Necessary for collecting and analyzing geologic field samples.					\$2,000
							<b>Sub Total</b>	<b>\$5,000</b>
<b>Capital Expenditures</b>								
							<b>Sub Total</b>	-
<b>Acquisitions and Stewardship</b>								
							<b>Sub Total</b>	-
<b>Travel In Minnesota</b>								

	Miles/ Meals/ Lodging	Personnel travel expenses for 4-6 week field survey	Field work is necessary for completing aggregate resource maps.					\$20,303
	Conference Registration Miles/ Meals/ Lodging	Personnel registration and qualifying travel expenses for in-State conferences and training.	Technical conferences provide opportunities for outreach and technical development of personnel.					\$7,010
							<b>Sub Total</b>	<b>\$27,313</b>
<b>Travel Outside Minnesota</b>								
							<b>Sub Total</b>	-
<b>Printing and Publication</b>								
	Printing	Print maps, brochures, and workshop invites.	Handout materials for local partners and workshop attendees.					\$500
							<b>Sub Total</b>	<b>\$500</b>
<b>Other Expenses</b>								
		Direct and Necessary	Calculated expenses for People Support (\$11,731), Safety Support (\$2,179), Financial Support (\$8,666), Communication Support (\$1,324), IT Support (\$23,648), and Planning Support (\$1,149)					\$48,697
							<b>Sub Total</b>	<b>\$48,697</b>
							<b>Grand Total</b>	<b>\$767,000</b>



## Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
Personnel - GIS Technician		Manages GIS data and cartography (Research Analysis Specialist Senior)	<b>Classified</b> : Position funding will be adjusted once the appropriation has been spent.

## Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
<b>State</b>				
Cash	General Fund	Supports personnel training and other expenses.	Pending	\$45,000
			<b>State Sub Total</b>	<b>\$45,000</b>
<b>Non-State</b>				
In-Kind	St. Louis County In-Kind services	Services related to geologic sample analyses.	Pending	\$18,000
			<b>Non State Sub Total</b>	<b>\$18,000</b>
			<b>Funds Total</b>	<b>\$63,000</b>

## Attachments

### Required Attachments

#### *Visual Component*

File: [b3d78cb7-685.pdf](#)

#### *Alternate Text for Visual Component*

Figure including a statewide map of DNR aggregate mapping program status, an inset of St. Louis County highlighting aggregate consuming infrastructure, and a list of mileage and feature counts for that infrastructure.

### Optional Attachments

#### *Support Letter or Other*

Title	File
St. Louis County Board Resolution Requesting Aggregate Mapping	<a href="#">0767c484-34f.pdf</a>
Letter of Support from RAMS	<a href="#">f7a42611-eba.pdf</a>

## 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?**

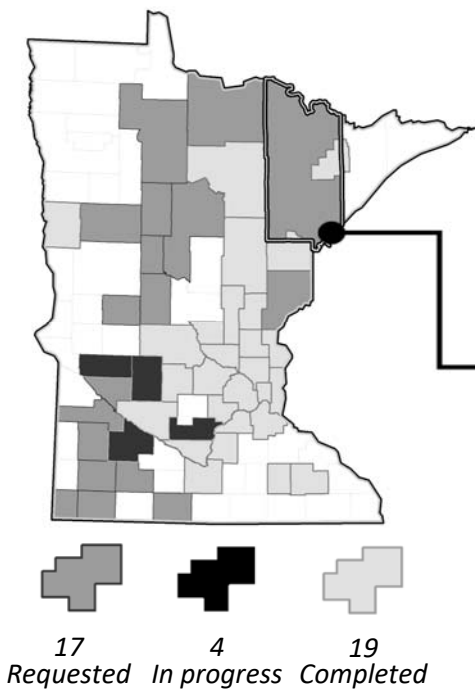
No

**Does the organization have a fiscal agent for this project?**

No

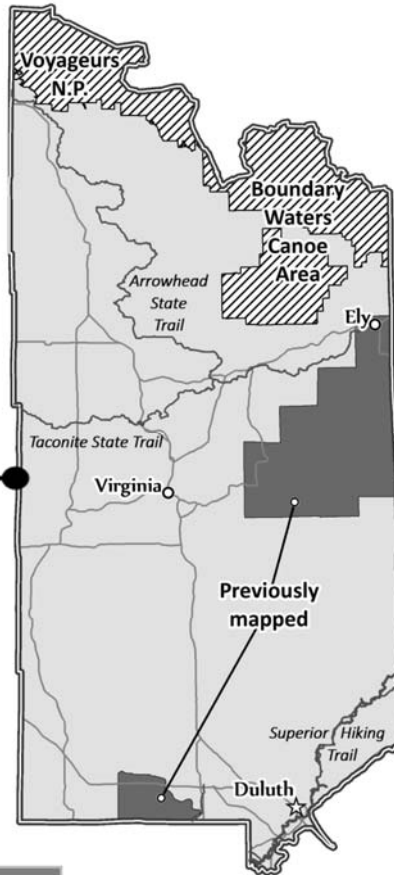
# Aggregate Resource Mapping of St. Louis County

## ARMP Statewide Status



## St. Louis County Infrastructure

- +2,500 miles of highway
- +3,000 miles of county and township roads
- +900 bridges
- +1,200 miles of public trails
- +200 state park campsites
- +200 boat launches



**m** DEPARTMENT OF  
NATURAL RESOURCES  
Division of Lands and Minerals

## Support for Aggregate Mapping

### Dr. Harvey Thorleifson, Director of the Minnesota Geologic Survey (MGS)

*"We support this proposal, as aggregate assessment is needed in every County. Our mapping supports all decision-making, and for each application, additional work is needed beyond what we do. This is true for groundwater, engineering, metallic minerals, and aggregate – sand and gravel or crushed stone. Future sources of aggregates will be needed to keep construction costs competitive, and to minimize truck traffic."*

### Nancy Daubenberger, Deputy Commissioner of Department of Transportation (MNDOT)

*"MNDOT supports mapping the aggregate resources of St. Louis County. Our agency is committed to meeting sustainability targets to reduce greenhouse gas emissions, reducing the cost of transportation projects, and preparing for impacts of climate change. Aggregate maps that identify local sources of aggregate are an important factor in meeting these goals."*

### Beth Pierce, Northern St. Louis County Trails Task Force (NSLCTTF)

*"Aggregate mapping in St. Louis County would benefit user groups, land managers and local governments that make up NSLCTTF as we navigate planning and construction of many current and future trail projects. Identifying aggregate sources before trails are conceived could save user groups and trail sponsors such as counties and cities money in redesign and relocation costs, and assist us with materials sourcing in the construction phase. Aggregate maps are a valuable resource to clubs, engineering firms and construction companies as proposed trail projects move forward."*

### Pike Town Board, St. Louis County

*"The Pike Town Board is offering this letter of support in regards to St. Louis County's grant application. The project associated with this grant would benefit our area townships by giving us local access to sand, gravel and other aggregates used within the area for various projects, maintenance and roadways. Thank you for this opportunity."*