

**PROJECT APPLICATION**  
Dickinson County Water Quality Commission  
Cover Sheet

1. Applicant Organization Friends of Lakeside Lab  
Street address 1838 Highway 86  
City Milford  
State Iowa  
Zip 51351  
Email friendsoflakesidelab@gmail.com  
Phone 712-3373669  
Organization contact Emily Baker
2. Project title: Iowa Great Lakes Monitoring & Assessment  
Location Iowa Great Lakes
3. Project Director Dr. Mary Skopec  
Street address 1838 Highway 86  
City Milford  
State Iowa  
Zip 51351  
Email Mary-skopec@uiowa.edu  
Phone 712-337-3669 ext. 5
  
4. Application submission date: 10/2/23
5. Brief description (75 words or less) of project, including expected results:  
  
This project will continue water quality monitoring efforts along with data analyses and public reporting on issues and actions to protect the lakes for the long-term. Project includes water quality monitoring of tributaries, groundwater monitoring, and lake monitoring to determine sources of E. coli and blue-green algae toxins that resulted in beach advisories. Additionally, interns will resume AIS education activities at boat ramps reminding visitors to remove visible vegetation, clean and dry boats before transporting them.
6. Amount requested through this grant application \* :\$28,000
7. Matching funds:  
Hard match \$82,940 (Anything paid for with real money)  
  
Source(s) Iowa Lakeside Lab, Iowa Geological Survey  
(If it is your intent to seek matching grants using the WQC funds, list those potential additional grants, the expected timing for funds to be available, and the dollars that will be requested)  
  
Soft match \$1,500 (Anything not paid with real money but has a value)  
Source(s) Iowa Lakeside Laboratory  
Other support \_\_\_\_\_

- a. Amount of Federal, State or other public cash match money already acquired or in process (list all and status): \$ 82,940 (acquired)
- b. Amount of private cash match funds: \$ \_\_\_\_\_
- c. Source of public and/or private cash match (list all): Iowa Lakeside Lab, Iowa Geological Survey

Is the project a portion of a larger, overall project to be implemented over a multi-year period?  
Yes \_\_\_\_\_ No x If yes, describe in project narrative and include in budget form as instructed.

**\* The Water Quality Commission will only obligate funds for current fiscal year. Any multi-year projects will be allowed to re-apply in subsequent years**

Type of project (select all that apply):

- Public education, public awareness and information dissemination
- Creation or maintenance of Best Management Practices
- Erection and maintenance of storm water run off facilities
- Bank stabilization Water treatment
- Water monitoring
- Watershed protection
- Activities to abate and remove invasive species
- Any other activity which will improve, protect or enhance the quality of water in the lakes in Dickinson County

**Estimated project dates:**

- a. Start Jan 2024 \_\_\_\_\_ b. Completion Dec 2024 \_\_\_\_\_

**Applicant's signature.** Upon signing in the space provided below, the applicant agrees to conform to the requirements pertaining to:

- **Civil Rights Assurance of Compliance:** The applicant hereby agrees that it will comply with Title VI of the Rights Act of 1964, 1873 and the age Discrimination Act of 1975 to the end that no person in the United States shall on the grounds of race, color, national origin or otherwise subjected to discrimination under any program or activity for which the Applicant-Recipient receives grant funds and hereby gives assurance that it will immediately take any measures to effectuate this agreement.

This assurance is binding on the Applicant-Recipient, its successors, transferees, and assignees, and the person or person whose signature appears below are authorized to sign this assurance on behalf of the Applicant-Recipient.

*Ernie Baker Executive Director Friends of Lakes and Lake*      *9/26/2023*  
Applicant's name and title      Date

**REQUIRED BUDGET FORM**

See Application Guidelines for this form.

**Proposed Budget for Current Grant Request Year (fill out with just the match for this year's WQC match if this is a multi-component, multi-year project, please fill out the second budget form with the entire budget and any anticipated grant dollars expected to be sought from WQC in future requests)**

	<u>Commission</u>	Hard Match*	Soft Match**	<u>Total</u>
1. Staff	\$ <u>25,000</u>	\$ <u>27,632</u>	\$ _____	\$ <u>52,632</u>
2. Supplies and Services	\$ <u>3,000</u>	\$ _____	\$ <u>500</u>	\$ <u>3,500</u>
3. Equipment	\$ _____	\$ <u>3,000</u>	\$ _____	\$ <u>3,000</u>
4. Travel	\$ _____	\$ _____	\$ <u>1,000</u>	\$ <u>1,000</u>
5. Water Monitoring	\$ _____	\$ <u>24,000</u>	\$ _____	\$ <u>24,00</u>
5. Land Acquisition	\$ _____	\$ _____	\$ _____	\$ _____
6. Land Development	\$ _____	\$ _____	\$ _____	\$ _____
7. Other	\$ _____	\$ <u>28,303</u>	\$ _____	\$ <u>28,303</u>
<b>Total</b>	\$ <u>28,000</u>	\$ <u>82,940</u>	\$ <u>1,500</u>	\$ <u>112,440</u>

\* **Hard Match is "real money spent" toward project goal.**

\*\* **Soft Match is money indirectly spent toward project goal. (This is important but not included in the dollar amount for points).**

You must attach a letter of support for each contributor of Hard Match dollars and soft match dollars that specifies the amount of money or service being provided. If you are seeking other grants using WQC funds as a match, list those grants in the budget narrative and the timing those grant funds are to be available.

**BUDGET NARRATIVE:** Attach a Budget Narrative. Follow directions in Application Guidelines.

Friends of Lakeside Lab, Inc. are requesting \$25,000 in staff costs to cover the intern salaries for 7 interns during the summer of 2024. An additional \$3,000 is also requested for support services to manage the intern program. Iowa Lakeside Laboratory will contribute \$58,940 in cash match and an additional \$1500 in soft match. Hard match includes room and board for the interns,

\$3000 in water monitoring equipment (sampling devices, algal toxin kits), travel costs for interns (gasoline and the use of the Lakeside truck), and printing of materials/reports. Hard cash match also includes a portion of time for the following employees: Dr. Rebecca Kauten (Scientist in

Residence), Dr. Mary Skopec (Director) and Matt Fairchild (Facilities Manager). Lakeside staff will supervise the development of a quality assurance project plan for the monitoring, the collection of water quality data and the assessment work. Soft match includes: \$1500 for office space, computer usage, internet usage, database maintenance. The Iowa Geological Survey has committed \$24,000 in cash match for analysis of water quality samples taken during 2024.

**TASKS AND DELIVERABLES:** Attach a list of Tasks and Deliverables following the Application Guidelines included in this packet.

The Friends of Lakeside Lab using the WQC grant funds and working through the Iowa Lakeside Laboratory (ILL) will recruit, interview, select, hire, train, and supervise seven college students knowledgeable in environmental science and public health to be part of our water monitoring and assessment team for 2024 during the summer of 2024. Iowa Lakeside Laboratory will provide their housing and meals along with college credit for their activities. Earn to Learn students will work with Lakeside personnel to monitor major tributary inflows to the Iowa Great Lakes for nutrients and sediment inflows (including flow measurements where possible) and groundwater levels at established groundwater wells. Lakeside Lab will also monitor and assess water quality at recreation beaches in the area with the goal of understanding why certain beaches have elevated E. coli and microcystin toxin levels that have resulted in advisories in recent years. The information will be shared with local resource managers to improve water quality at those beaches. Additionally, Lakeside reinstate the boat ramp education program to inform visitors of the need to remove visible vegetation, clean and dry boats/trailers/props. Lakeside will also monitor Miller's Bay weekly to determine the presence or absence of Eurasian Watermilfoil. Information on prevention will also be developed and shared with businesses or entities with significant vulnerabilities for transporting AIS.

Task	Deliverable
Tributary Monitoring/ Groundwater Monitoring	Data collected from tributary and groundwater sites
Analyses of Tributary/Groundwater Data	Report of results
Public Information and Dissemination of Water Quality Results	Pamphlets, social media, Presentations on Results
Focused monitoring on recreational beaches	Evaluation on sources of E. coli and recommendations for improvement
Invasive species education at boat ramps	Information disseminated on invasive species removal from boat trailers, boat props and other techniques.
Focused Invasive Species monitoring in Millers Bay	Weekly monitoring of vegetation in Miller's Bay to determine presence/absence of EWM or other AIS
Dissemination of Intern Work to Community	Public Presentations to the Community (for example Blue Water Festival)
Compilation of Results and Information	Annual Report

## PROJECT NARRATIVE

Attach project narrative following the instructions in application guidelines, including:

### Background:

It is critical to understand the source, transport, and fate of pollutants into the lakes, including N, P, and total suspended solids. This proposal is focused on characterizing pollutant loading to the Iowa Great Lakes system and the contributing sources such as feeder streams, drainage tiles, and urban sources. Grab samples (i.e., samples collected at a point in time) will be collected at approximately 12 locations around the Iowa Great Lakes. Sites were selected in consultation with DNR staff and other scientists (proposed sites are shown in the figure below). Samples are collected on a stratified seasonal basis that includes monthly samples in Jan, Feb, Oct, Nov and Dec, bi-weekly samples in Mar, Apr, Jul, Aug and Sep, and weekly samples in May and Jun for a total of 23 grab samples per year at each site. Samples will be collected by the Iowa Lakeside Laboratory research staff and interns. Water samples will be hand delivered to the State Hygienic Laboratory located at Iowa Lakeside Laboratory for analysis of nitrate-nitrogen, total and dissolved phosphorus, turbidity, and total suspended solids. Grab samples will also be tested in the field for temperature, pH, specific conductance, and dissolved oxygen using a multi-meter. A quality assurance project plan was completed by the Lakeside staff to ensure data quality and credibility. 2024 will be the third year of sampling. An extra year was added to the monitoring project due to extreme drought conditions in 2022 and 2023. The extra year of data will provide a better assessment of nutrient delivery over a range of hydrologic conditions.

In addition to grab sampling, the Iowa Geological Survey will deploy three continuously reading turbidity sensors. Turbidity is a proven surrogate for particulate (sediment-bound) phosphorus concentrations in Iowa's rivers and these sensors will be deployed at streams draining catchment areas considered to be sediment erosion hot spots.

Grab sampling water quality concentration data and particulate P concentrations derived from turbidity will be combined with the continuous stream gaging data to quantify pollutant loads into the IGL system on an annual, seasonal, and daily basis. Aggregated data will be used to identify hot spots of pollutant loading, calculate pollutant mass balances within the lakes, and characterize lake processes that may be attenuating or perhaps exacerbating the effects of incoming pollutants.

Additionally, we will conduct monitoring on recreation beaches in the Iowa Great Lakes. Emerson Bay, Crandall's Beach, and Marble Beach all fell under no-swimming advisories in 2022 and 2023 due to E. coli bacteria and/or blue-green algae toxins. The focused monitoring will assess the sources of E. coli and microcystin toxin and develop strategies to mitigate the problem. Lakeside will work with Dickinson County public health to improve communication regarding swimming at public owned beaches.

Similarly, the late summer discovery of Eurasian Watermilfoil (EWM) has re-established the need to have a robust invasive aquatic species (IAS) program in the Iowa Great Lakes. We will reinstate the boat ramp education program that was discontinued in 2022 and engage with visitors regarding the need to remove visible vegetation as well as clean and dry boats or trailers. Given the appearance of EWM in the canals of West Okoboji, we propose to do extensive monitoring of disturbed areas of the Miller's Bay lakebed to identify any encroachment of EWM in the Bay. Aggressively monitoring the Bay will be key to early detection and

management. The interns will also develop a public education campaign to highlight the need to proactively prevent transport of Watermilfoil or other invasive species. Lastly, the interns will work on public information geared at helping residents and visitors understand water quality in the Iowa Great Lakes and how to improve stewardship of our resources.

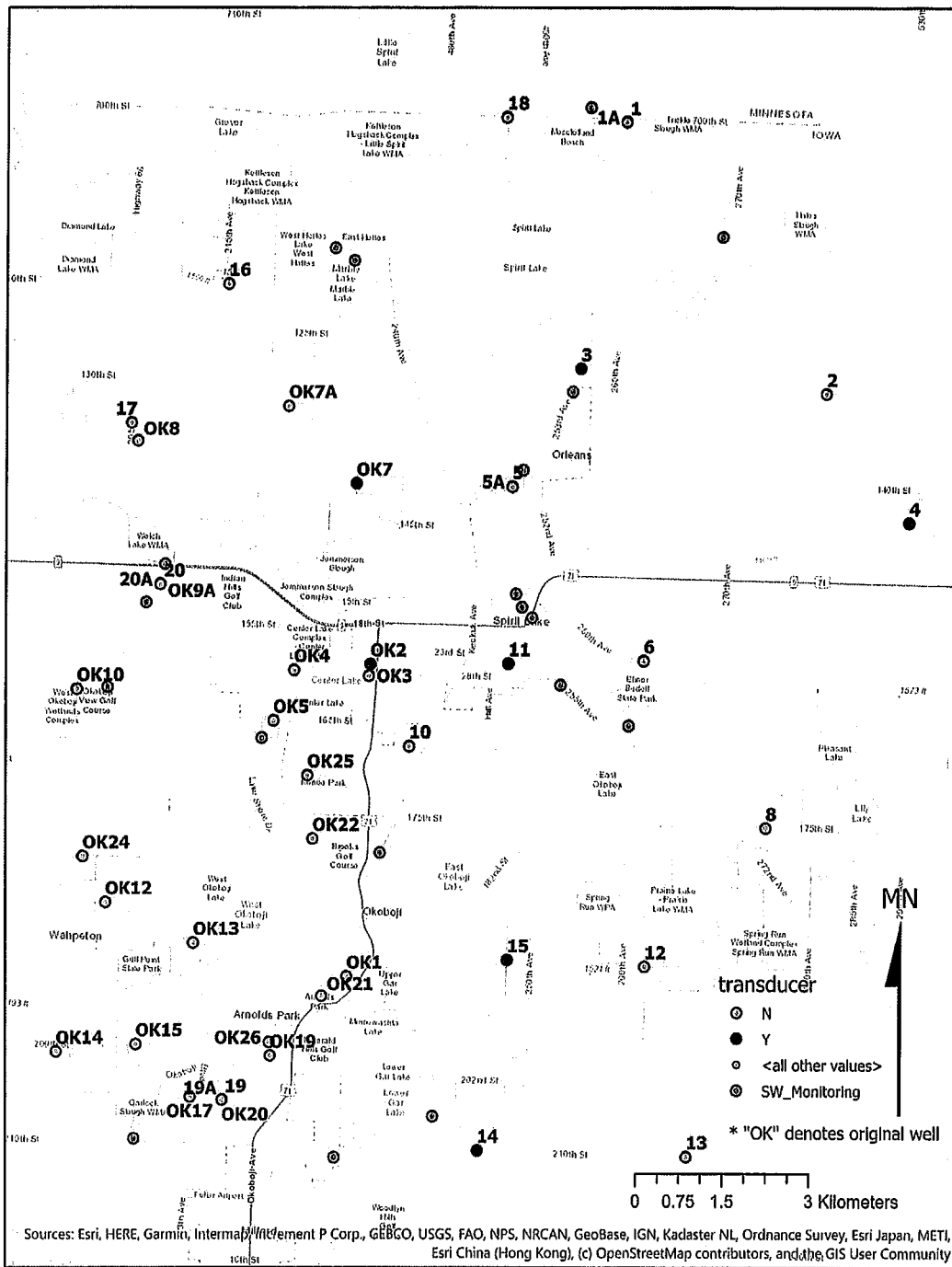
#### **QUALIFICATIONS OF GROUP OR AGENCY**

The Friends of Lakeside Lab was founded in 1994 to support Iowa Lakeside Laboratory and Regents Resource Center through scholarships and as a community resource for water quality monitoring, environmental education, and research. The Friends is a tax-exempt, 501c3 non-profit organization. The Friends were instrumental in creating the Cooperative Lake Area Monitoring Project (CLAMP), the longest running lake monitoring program in the State of Iowa.

Iowa Lakeside Laboratory Lakeside Lab is owned by the state of Iowa and operated through the Board of Regents. Lakeside provides science classes and research opportunities for university students along with outreach programs to support the Iowa Great Lakes Community. Dr. Mary Skopec has served as the Executive Director of Iowa Lakeside Laboratory since December of 2016. Prior to joining Lakeside, Mary was the water quality monitoring coordinator for the Iowa Department of Natural Resources.

Dr. Skopec earned her B.S. and M.A. degrees in geography from The University of Iowa, and in 1999, she completed her interdisciplinary Ph.D. in environmental science also at The University of Iowa. Dr. Rebecca Kauten is Lakeside's post-doc Scientist in Residence. Dr. Kauten received her Ph.D. in geographical and sustainability sciences at The University of Iowa in 2019. Prior to joining the Lab, she worked as the urban water quality coordinator for the Iowa DNR's Water

Monitoring Program and as the Dry Run Creek watershed coordinator in Cedar Falls, IA.



Location of Surface Water Sampling Sites (SW\_Monitoring), Groundwater Wells (OK#)

**STATEMENT OF PROJECT NEED:**

The two primary threats to the Iowa Great Lakes are degraded water quality through delivery of sediment, nutrients, and other contaminants and encroachment of aquatic invasive species such as the newly found presence of Eurasian Watermilfoil in the canal systems of West Okoboji. Contaminants are delivered to the lakes from tributaries or directly from shorelines and

Application 8  
 Last Revised: 6-14-2023 all previous dates are obsolete.



near shore areas. To adequately target and mitigate watershed sources of nutrients and sediment, it is important to conduct a robust monitoring program to identify where significant sources are entering the system and to pinpoint the circumstances of when the concentrations are highest (i.e., during rainstorm events, contributions of illicit discharges during low flow, etc.) Addressing these threats protects our quality of life and the economic vitality of the lakes area. This project aligns with the water monitoring needs as outlined in the Iowa Great Lakes Management Plan (<https://cleanwateralliance.net/wp-content/uploads/2021/10/revision-to-final-man-plan-June-14-2018-Reduced.pdf>). Specifically, we aim to conduct water quality monitoring that quantifies nutrients and sediments entering the Iowa Great Lakes from major tributaries under a variety of conditions.

The addition of E. coli and microcystin toxin monitoring has become increasingly important as the news media highlighted the frequent beach advisories at several locations in the IGLs. The negative attention created by the beach advisories may impact the local economy if visitors feel unsafe at our local beaches. Monitoring and assessment of the sources/reasons for the advisories can help us be proactive in addressing these issues.

The discovery of Eurasian Watermilfoil in East Okoboji Lake during the summer of 2022 and the canal systems of West Okoboji during the summer of 2023 highlights the need to be vigilant in monitoring and reporting on the presence of IAS in the Great Lakes. The project proposed will reinstate the presence of Lakeside interns at Hattie Elston and Emerson Bay boat ramps to remind visitors to remove vegetation, clean and dry boats before transporting them. The interns will also conduct weekly monitoring in Millers Bay to identify the presence of EWM and report any instances of the invasive species to the DNR in a timely manner.

## **STATEMENT OF PROJECT BENEFITS TO WATER QUALITY**

Water quality monitoring of incoming tributaries is an essential piece of the watershed management program for the IGL. The data collected will provide information on the timing and magnitude of nutrients and sediment entering the lake system from different sources and under different hydrologic and weather regimes. The assessment of the land use change and how these changes have affected water quality (in relation to the CLAMP data) will help the community understand the value of conservation practices and the amount of conservation implementation that is needed to achieve reductions in phosphorus in the lake system. While models are crucial to the development of plans, they are best when coupled with on-the-ground data that help to verify assumptions and calculations. Especially in low-gradient environments such as our glacial lake systems, assumptions about erosion and delivery of nutrients may be inaccurate. The groundwater monitoring will help researchers understand the role of groundwater in feeding the lakes and potentially delivering nutrients through shallow groundwater systems. The analysis of these data will further our goals of watershed protection for the IGL system. Additionally, the information campaign on use of native prairie plants as pollinator friendly lawns and implementation of raingardens will reduce the storm water flows off urban lots into the lake systems. With increased development pressure around the lakes, these best management practices can help to stabilize soils, sequester nutrients, and infiltrate rainwater.

## **PUBLIC AWARENESS PLAN**

Lakeside Lab will promote the project and results of the projects in several ways including (but not limited to) public presentations at our Tuesday Night Seminars, on KUOO for the Lakeside Science Minute, social media posts (Facebook, Instagram, Twitter), newspaper articles and flyers. Results from the projects will be highlighted at the Prairie Lakes Conference, Blue Water Festival and at a public presentation/showcase of results at Iowa Lakeside Lab.

The Iowa Lakeside Lab will publish water quality results on their website and make reports of results available via the web and in hard-copy format. The IIHR and Geological Survey will also publish results on their Iowa Water Quality Information System Iowa Water Quality Information System I IWQIS ([iowawis.org](http://iowawis.org))

### **Maintenance Plan and Data Rights**

Water quality data will be stored by the Iowa Lakeside Laboratory and made available to the public both through the Lakeside website and through the IIHR Geological Survey in the Iowa Water Quality Information System (IWQIS). Reports will be provided on the Lakeside website at [www.iowalakesidelab.org](http://www.iowalakesidelab.org). GIS data will be served through the Lakeside web portal. Backup copies of the water quality data are also stored at the State Hygienic Laboratory in the SHL Environmental Laboratory Information System (ELIS).



IOWA LAKESIDE LABORATORY

September 25, 2023

To: Dickinson County Clean Water Commission

Subject: Letter of Support 2024 Friends of Lakeside Lab, Inc. Water Quality Grant

Dear Commissioners:

Iowa Lakeside Laboratory is pleased to provide support for the Friends of Lakeside Lab's Iowa Great Lakes Monitoring & Assessment Proposal. Lakeside will commit \$55,940 in hard cash match for the project and an additional \$1500 in soft match support.

We are pleased to be working with IIHR and the Iowa Geological Survey to conduct water quality monitoring of the inflows to the Iowa Great Lakes. This study will help us understand the delivery of nutrients and sediment to the Iowa Great Lakes and the flux out of the system. These data will be critical in assessing the long-term protection of the lake and will assist with the identification of areas that need further conservation actions.

For these reasons, Iowa Lakeside Lab is pleased to be able to support this project and encourages the Dickinson County Water Quality Commission to consider providing funding to this worthwhile project.

Sincerely,

Mary Skopec, Ph.D.  
Executive Director  
Iowa Lakeside Laboratory: Regents Resource Center  
1838 Hwy 86  
Milford, IA 51351-7267  
*Mary-Skopec@uiowa.edu*

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**College of Engineering**

Iowa Geological Survey  
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Iowa City, Iowa 52242  
319-335-1675 Fax 319-335-5238  
[www.iowageologicalsurvey.org](http://www.iowageologicalsurvey.org)

September 25, 2023

To: Dickinson County Water Quality Commission

From: Keith Schilling, Iowa Geological Survey, University of Iowa

Subject: Letter of Support 2024 Water Quality Monitoring

Dear Commissioners:

I am writing to offer my unequivocal support for funding student labor at Lakeside Lab to assist with water quality sample collection around the Iowa Great Lakes. If you are not aware, the Iowa Geological Survey at the University of Iowa was awarded funding from the Iowa Department of Natural Resources to monitor groundwater, surface water stage and surface water quality within the Iowa Great Lake watersheds. Data collected during the study will support development of a watershed model to assess current and future conditions and evaluate the cost effectiveness of conservation practices and land management decisions implemented to improve water quality.

It is critical to understand the source, transport and fate of pollutants into the lakes, including N, P, and total suspended solids by collecting surface water quality samples from tributary streams, drainage tiles, and urban sources. The annual cost for the water sample analysis at the State Hygienic Laboratory is approximately \$24,000 and student labor support is critical for the collection of these samples in a timely manner. It is simply not feasible for staff to travel from Iowa City to collect the grab samples when conditions can vary quickly throughout the year.

For these reasons, the Iowa Geological Survey supports the water quality monitoring activities and encourages the Dickinson County Water Quality Commission to consider providing funding to this worthwhile project.

Sincerely,

A handwritten signature in cursive script that reads "Keith Schilling".

Dr. Keith Schilling  
State Geologist and Director, Iowa Geological Survey  
The University of Iowa