Environment and Natural Resources Trust Fund

2021 Request for Proposal

General Information

Proposal ID: 2021-403

Proposal Title: Innovative Solution for Protecting Minnesota Natural Resources from PFAS Contamination

Project Manager Information

Name: Bill Keegan

Organization: Dem-Con

Office Telephone: (952) 224-7102

Email: billkeegan@dem-con.com

Project Basic Information

Project Summary: Protection of State's drinking water resources and natural resources by eliminating a new Contaminant of Emerging Concern (CEC) known as Perfluoroalkyl and Polyfluoroalkyl substances (PFAS) from point source discharges.

Funds Requested: $750,000

Proposed Project Completion: 2022-12-31

LCCMR Funding Category: Water Resources (B)

Project Location

What is the best scale for describing where your work will take place?

Region(s): Metro

What is the best scale to describe the area impacted by your work?

Statewide

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.

Per – and polyfluoroalkyl substances (PFAS) are a group of synthetic chemicals that have been in use since the 1940s. PFAS are found in a wide array of consumer and industrial products such as food packaging materials, nonstick cookware, stain/water resistant carpet and clothing, cleaning products, paints, varnishes, sealants, firefighting foam, cosmetics, etc. Current water treatment technologies are ineffective at removing PFAS resulting in impacts to the State's drinking water, surface water, fish and wildlife, and human populations. Due to the widespread use, documented contamination, and persistence in the environment, PFAS has become a Contaminant of Emerging Concern (CEC) both federally and locally in Minnesota. Research indicates that these contaminants can be harmful to human health and the Minnesota Department of Health (MDH) established health-based advisory values as low as 15 parts per trillion (ppt). An innovative treatment technology is being proposed by Dem-Con Companies (Dem-Con) to remove PFAS from contaminated water before it enters the environment. Once demonstrated, this technology can be implemented on a broader basis for residential, commercial, and industrial discharges throughout the State of Minnesota protecting our natural resources.

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.

Dem-Con is a progressive leader in the waste recycling, processing, and public education space. We will continue to look for opportunities to improve the environment by moving beyond the status quo and this project is another example of this initiative. Our interest in this project is to not only to address an emerging environmental and health concern for Minnesota, but we believe that addressing this issue "up-stream" at the source, regardless of the source, is a more proactive way of protecting the environment and our natural resources. To demonstrate our commitment to the project and the environment, Dem-Con is proposing to fund 50% of the initial project costs and 100% of the annual operations, reporting, and maintenance costs ($100,000/yr) throughout the expected 15-year life of the treatment system. The proposed system will clean up over 60 million gallons of contaminated water at the Dem-Con site alone and infinitely more when applied to sites throughout the state of Minnesota. The financial commitment from Dem-Con will maximize the return on investment for the Legislative Citizen Commission on Minnesota Resources (LCCMR) and the State of Minnesota.

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?

Design, engineer, and build a water treatment system at the Dem-Con Environmental Campus. The documented PFAS concentrations present in the landfill leachate are higher than most domestic wastewater providing a unique opportunity to evaluate this technology which could then be applied not only to other industrial point source discharges but also more broadly to domestic wastewater. Additionally, we will conduct a structured research program to characterize the feed material (leachate), conduct treatability studies, perform repeatability tests, durability evaluation, and prepare publicly available data summaries, conclusions and recommendations for application of this technology to different sources of these contaminants.

Activities and Milestones

Activity 1: Design, Engineer, and Build Treatment System

Activity Budget: $650,000

Activity Description:
Design, engineer, and build a wastewater treatment system at the Dem-Con Environmental Campus in Shakopee, Minnesota to treat leachate from the landfill located at the site. The treatment system is unique from existing treatment technologies in that it can treat <2000 Daltons particle size and can handle up to 10% of suspended solids and co-contaminants while still removing PFAS contaminates down to less than 10 ppt. The documented PFAS concentrations present in the landfill leachate are higher than most domestic wastewater providing a unique opportunity to evaluate this technology on a "industrial strength" discharge which could then be applied not only to other industrial point source discharges but also more broadly to the lower concentrations found in domestic wastewater.

Activity Milestones:

Description	Completion Date
Design treatment system for our facility by evaluating site specific criteria and analytical data.	2021-12-31
Engineer and implement process solutions based on the design developed.	2022-01-31
Construct the system including supporting infrastructure such as the building and discharge infrastructure.	2022-06-30

Activity 2: Conduct Analysis of Program

Activity Budget: $50,000

Activity Description:
Conduct a structured analysis of the program to characterize the fee material (leachate), conduct treatability studies, perform repeatability test and durability evaluation.

Activity Milestones:

Description	Completion Date
Characterize the feed material (leachate)	2022-06-30
Conduct treatability studies.	2022-07-31
Perform repeatability test and durability evaluation	2022-08-31

Activity 3: Report Conclusions, Recommendations & Broader Implementation

Activity Budget: $50,000

Activity Description:
To collect, collate, infer, and analyze all the data produced during these activities and prepare a comprehensive, publicly available, report which will include data summaries, conclusions, and recommendations for application of this technology to different sources of these contaminants throughout the State of Minnesota. Potential opportunities for applying the results of these studies may include various industrial discharges, groundwater and surface water treatment/remediation systems, and domestic water quality treatment systems.

Activity Milestones:

Description	Completion Date
Collect and analyze data.	2022-11-30
Recommendation of potential sources that could utilize technology	2022-12-31
Preparation of a comprehensive report	2022-12-31

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Mehdi Sarfaraz, BSc	Clark Technology, LLC	Project Support	No
Mr. Vladimir Shceglowski, BSc. PE	Clark Technology, LLC	Engineering Design & Implementation	No
Dr. Abi Assadi, PhD, PE	Clark Technology, LLC	Quality Control/Quality Assurance	No
Dr. Kazem Oskoui, PhD	Clark Technology, LLC	Project leader and chief scientific officer	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?

As a progressive leader in the industry, Dem-Con is committed to the success of this project and helping to pioneer a new technology that will improve the quality of human health, the environment, and our natural resources. To demonstrate this commitment, we are proposing to fund 50% of the initial project costs matching each grant dollar with an in-kind Dem-Con contribution. Additionally, Dem-Con will be responsible for funding 100% of the ongoing operational, maintenance, and reporting costs throughout the expected 20-year life of the equipment.

Project Manager and Organization Qualifications

Project Manager Name: Bill Keegan

Job Title: President

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

Bill Keegan is the president of Dem-Con Companies (Dem-Con). Dem-Con Companies is a third-generation family owned business that has been providing waste disposal, recycling, and processing solutions to Scott County residents since the 1960s. Dem-Con has continued to evolve toward more processing and recycling, leading the industry toward a more integrated approach to solid waste management system. One example of this evolution and move toward increasing landfill diversion is our "Environmental Campus" of processing and recycling operations surrounding the landfill. The Dem-Con Environmental Campus consists of a Construction and Demolition (C&D) recycling facility, shingle recycling facility, wood recycling facility, metals scrap and recycling yard, and one of our newest additions the Dem-Con Materials Recovery Facility (DCMRF). Dem-Con has been recognized as a leader in the industry receiving several awards from the National Waste and Recycling Association (NWRA) for Recycling Facility of the Year in 2018, the Recycling Association of Minnesota (RAM) for Recycler of the Year in 2015, the Solid Waste Association of North America (SWANA) award for Gold Excellence in Recycling Systems in 2015, and we the Minnesota Governors Award for Pollution Prevention in 2012.

Organization: Dem-Con

Organization Description:

Dem-Con Companies (Dem-Con) is a third-generation family owned business that has been providing waste disposal, recycling, and processing solutions to Scott County residents since the 1960s. Dem-Con has continued to evolve toward more processing and recycling, leading the industry toward a more integrated approach to solid waste management

system. One example of this evolution and move toward increasing landfill diversion is our "Environmental Campus" of processing and recycling operations surrounding the landfill. The Dem-Con Environmental Campus consists of a Construction and Demolition (C&D) recycling facility, shingle recycling facility, wood recycling facility, metals scrap and recycling yard, and one of our newest additions the Dem-Con Materials Recovery Facility (DCMRF). Dem-Con has been recognized as a leader in the industry receiving several awards from the National Waste and Recycling Association (NWRA) for Recycling Facility of the Year in 2018, the Recycling Association of Minnesota (RAM) for Recycler of the Year in 2015, the Solid Waste Association of North America (SWANA) award for Gold Excellence in Recycling Systems in 2015, and we the Minnesota Governors Award for Pollution Prevention in 2012.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	$ Amount
Personnel								
							Sub Total	**-**
Contracts and Services								
							Sub Total	**-**
Equipment, Tools, and Supplies								
							Sub Total	**-**
Capital Expenditures								
		Design, Engineer, and Build Treatment System	Design, engineer, and build a LeachBuster® wastewater treatment system at the Dem-Con Environmental Campus to treat leachate from the landfill located at the site.					$750,000
							Sub Total	**$750,000**
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	**$750,000**

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				
In-Kind	As a progressive leader in the industry, Dem-Con is committed to the success of this project and helping to pioneer a new technology that will improve the quality of human health, the environment, and our natural resources. To demonstrate this commitment, we are proposing to fund 63% of the initial project costs not only matching each grant dollar, but exceeding it with an in-kind Dem-Con contribution. Additional, Dem-Con will be responsible for funding 100% of the ongoing operational, maintenance, and reporting costs throughout the expected 20-year life of the equipment.	Funding of 63% of the overall project costs including the design, engineering, and construction of a treatment system as well as conducting the analysis of program, reporting, conclusions, recommendations & broader Implementation.	Secured	$1,250,000
			Non State Sub Total	**$1,250,000**
			Funds Total	**$1,250,000**

Attachments

Required Attachments

Visual Component

File: dc2aef60-cd4.pdf

Alternate Text for Visual Component

Minnesota's Industrial Wastewater is treated using innovative technology to remove PFAS and other water contaminants protecting our environment. Clean water is then released into the environment.

Optional Attachments

Support Letter or Other

Title	File
MPCA Letter of Support	1c8dc791-5f9.pdf

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

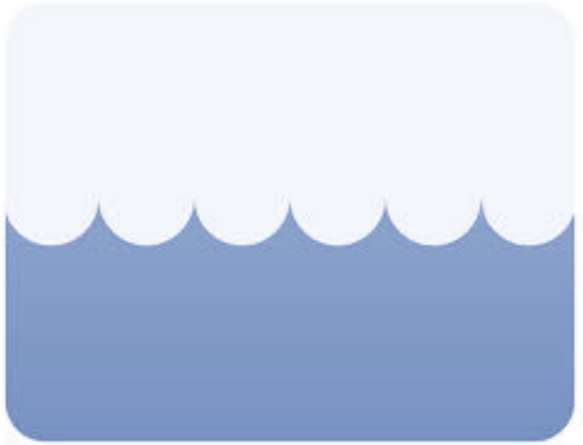
Does the organization have a fiscal agent for this project?

No

Protecting Minnesota's Water by Removing PFAS

Industrial Wastewater

Innovative treatment technology to remove PFAS and other water contaminants



Clean Water for Environment