





**Environment and Natural Resources Trust Fund (ENRTF)**

**2014 Main Proposal**

**Project Title: Minnesota EV Trail: Solar Chargers for Electric Vehicles**

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**I. PROJECT STATEMENT**

The goal of this project is to install solar powered electric vehicle charging stations at 6-8 DNR State Parks. This will establish the first phase of core links in a chain of solar powered electric vehicle (EV) charging stations across Minnesota. Within 4 years we expect this **Minnesota EV Trail** to reach from Iowa to the Canadian border, greatly accelerating the adoption of electric vehicles in Minnesota. These systems will be accessible to the public and DNR will interpret the use and benefits of renewable energy and electric vehicles to visitors on-site or on the web. We believe this will be the first solar powered EV trail in the US.

There are three primary objectives for our project:

- Install at least 50 KW of grid-tied, photovoltaic (PV) systems and 1-2 electric vehicle charging stations at 6-8 DNR sites.
- Inform and engage the public about renewable energy and electric vehicles in a comprehensive fashion that includes demonstrations, interpretative programming and displays.
- Complete the project efficiently by leveraging the site selection tool, system designs and specifications, performance monitoring approach and installation experience that have been previously developed by DNR.

**II. DESCRIPTION OF PROJECT ACTIVITIES**

**Activity 1: Finalize Site Selection**

**Budget \$3,000**

DNR has identified a list of potential sites for solar powered EV charging stations. Our first task is to finalize the list of sites. We will use the site selection tool DNR has previously developed and make site visits with the project team to finalize sites. Selected sites will be prioritized and sequenced into 2015 and 2016 construction timelines.

<b>Outcome</b>	<b>Completion Date</b>
• Outcome 1: Finalized List of Selected Sites	September 15, 2014
• Outcome 2: Construction Timeline for 2015 and 2016	September 30, 2014

**Activity 2: Design, Bid and Contract for 2015 Systems.**

**Budget \$4,000**

DNR has the largest portfolio of renewable energy systems in Minnesota, including 22 PV systems and 3 EV charging stations. DNR will leverage existing system designs, bid specifications and a familiar state bidding process to complete this activity in five months.

• Outcome 1: Signed contracts for 2015 systems	February 28, 2015
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**Activity 3: Install 2015 PV Systems**

**Budget \$50,000**

Leveraging our prior construction management experience and with a high probability of seeing bids from contractors we have already worked with, we are confident the systems can be installed by the end of 2015. DNR will contribute an additional \$150,000 in bonding to fund these 2015 PV systems.

• Outcome 1: 3-4 systems installed and commissioned	December 31, 2015
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**Activity 4: Design, Bid and Contract for 2016 Systems.**

**Budget \$4,000**

DNR will leverage existing system designs, bid specifications and a familiar state bidding process to complete this activity in five months.

• Outcome 1: Signed contracts for 2016 systems	February 28, 2016
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**Activity 5: Install 2016 PV Systems**

**Budget \$190,000**

Leveraging our prior construction management experience and with a high probability of seeing bids from contractors we have already worked with, we are confident the systems can be installed by the end of 2016.

• Outcome 1: 3-4 systems installed and commissioned	December 31, 2016
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**Activity 6: Development of Interpretive Program**

**Budget \$10,000**

The DNR has already developed an effective interpretative program for renewable energy. This phase will extend that program to the new sites and add interactive content for electric vehicles. New signage for the EV chargers will be developed.

• Outcome 1: Renewable Energy and Electric Vehicle interpretive program extended	December 31, 2016
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**III. PROJECT STRATEGY**

**A. Project Team/Partners**

The project team consists of five groups of people:

- DNR Project Manager who will administer the grant contract, manage the overall project and provide PV and EV charging system site selection, design and contract management experience
- DNR Architect with expertise in architecture and design of state facilities
- DNR Park Operations staff with expertise in park operations, assessment of impacts to historical park features, park management plans and interpretative design
- Installation Contractors experienced with renewable energy and EV charging systems
- DNR site facilities staff that will provide site-specific expertise.

**B. Timeline Requirements**

DNR expects to complete the project by the end of 2016 by leveraging the site selection tool, system designs and specifications, performance monitoring approach and installation experience that we developed over the last three years.

**C. Long-Term Strategy and Future Funding Needs**

This proposal addresses the Air Quality, Climate Change, and Renewable Energy funding priority.

DNR has a long-term strategy of establishing a statewide network of solar powered EV charging stations.

Minnesota will benefit from this in a number of ways:

- Reduced carbon emissions from generation of solar electricity and reduction in vehicle fossil fuel will reduce impacts on human health, the environment and Minnesota’s natural resources.
- The growing solar industry in Minnesota will create jobs, expanding the tax base and spendable income
- The development of the Minnesota EV Trail will attract visitors from within Minnesota and from other states. The increased spending related to tourism will benefit Minnesota.
- Minnesota electric utilities will sell more nighttime, off peak energy for home EV charging to the growing ranks of EV owners. This will leverage the utilities’ fixed costs and help mitigate increases in future electric rates.
- Increased distributed generation of electricity will reduce grid stress on hot summer days, reducing grid issues, purchases of more expensive peak load power and deferring upgrades to transmission lines.
- Minnesotans using the EV Trail will have reduced fuel costs.
- The DNR energy monitoring approach will allow the recording, real-time display and data downloading of KW power usage during EV charge cycles. This data will be available to the public and can be used to understand the factors influencing energy usage over the charge cycle, such as initial state of charge, outside temperature, etc.

The implementation of our strategy will occur in three phases, dependent on funding from grants and bonding. This first phase of the project will be funded by ENRTF (\$261,000) and DNR (\$150,000 bonding) and will establish 6-8 solar powered EV charging stations along the eastern border of Minnesota. The second phase of the project will be funded by a pending XCEL energy RDF Grant and establish another 8-10 solar powered EV charging stations. The third phase of the project will complete the EV Trail and be funded by future bonding from the Minnesota legislature.

## 2014 Detailed Project Budget

**Project Title:** Minnesota EV Trail: Solar Chargers for Electric Vehicles

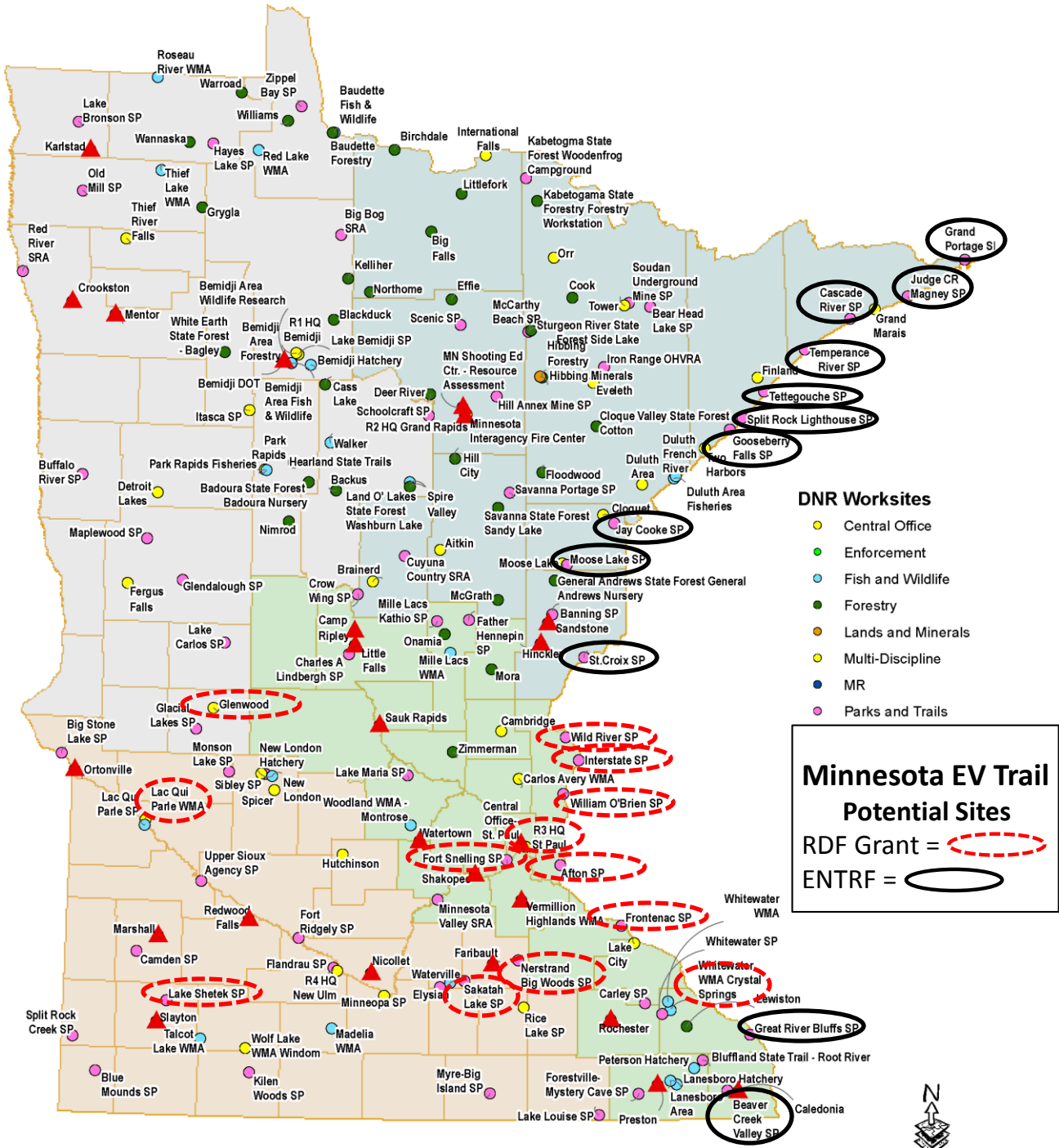
### IV. TOTAL ENRTF REQUEST BUDGET 3 Years

<u>BUDGET ITEM</u> (See "Guidance on Allowable Expenses", p. 13)	<u>AMOUNT</u>
<b>Contracts:</b> Installation of PV systems and EV chargers. This equipment has a single use throughout its 25+ year useable life - the generation of renewable electricity and the charging of electric vehicles.	\$ 240,000
<b>Other: Professional Services</b> This appropriation funds project management services billed using a professional services rate of \$80/hour. The professional services hourly rate includes salary and fringe for facilities staff, travel costs, supplies, and related costs necessary to carry out the project management functions. Cost coding will be used to record time spent on the project management activities. Services not received or provided will not be billed.	\$ 11,000
<b>Equipment/Tools/Supplies:</b> N/A	\$ -
<b>Acquisition (Fee Title or Permanent Easements):</b> N/A	\$ -
<b>Travel:</b> N/A	\$ -
<b>Additional Budget Items:</b> Interpretive Signage	\$ 10,000
<b>TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST =</b>	<b>\$ 261,000</b>

### V. OTHER FUNDS

<u>SOURCE OF FUNDS</u>	<u>AMOUNT</u>	<u>Status</u>
<b>Other Non-State \$ Being Applied to Project During Project Period:</b> N/A	\$ -	
<b>Other State \$ Being Applied to Project During Project Period:</b> Bonding for construction of solar arrays in 2015	\$ 150,000	Secured
<b>In-kind Services During Project Period:</b> N/A	\$ -	
<b>Remaining \$ from Current ENRTF Appropriation (if applicable):</b> N/A	\$ -	
<b>Funding History:</b> N/A	\$ -	

# Minnesota EV Trail – Potential Sites



**DNR Worksites**

- Central Office
- Enforcement
- Fish and Wildlife
- Forestry
- Lands and Minerals
- Multi-Discipline
- MR
- Parks and Trails

**Minnesota EV Trail Potential Sites**

RDF Grant = [Red dashed oval]

ENTRF = [Black solid oval]



## **Project Manager Qualifications**

### **Rob Bergh, DNR Energy Coordinator**

Rob has over 30 years of experience in engineering, consulting, sales and energy management. Over the last four years Rob has been instrumental in developing the DNR's energy strategy and building an organizational capability for sustainable operations. DNR's Sustainable Operations Capability was recently recognized as one of three finalists in the Energy and Climate Protection category for the Minnesota Environmental Initiative Awards. Rob managed the \$900,000 Xcel Energy RDF Grant awarded in 2009 that successfully launched DNR renewable energy efforts by installing 113 KW of photovoltaic capacity at 8 systems. Since that time Rob has designed and managed all aspects of the PV installations at an additional 14 sites around the state. Last year Rob supervised the installation of three electric vehicle chargers at DNR facilities. Rob is LEED certified and NABCEP certified in photovoltaic system design.

### **PROFESSIONAL HISTORY**

- Minnesota Natural Resources Department, Energy Coordinator
- BPS Green Futures, Sustainability and Renewable Energy Consulting Services
- Best Buy Company, Vice President, Enterprise Transformation
- Computer Science Corporation, Partner, Consulting Group
- The Pillsbury Company, Director, Management Information Systems
- Coopers & Lybrand, Senior Manager, Consulting Group
- IBM Corporation, Manufacturing Engineer; Sales Representative

### **EDUCATION**

- University of St. Thomas, St. Paul, MN M.B.A.
- Washington University, St. Louis, MO B.S., Electrical Engineering
- Lawrence University, Appleton, WI B.A., Biology/Chemistry

### **Organization Description**

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