

Environment and Natural Resources Trust Fund (ENRTF) 2010 Work Program

Date of Report: 1/27/2010
Date of Next Progress Report: 1/15/2011
Date of Work Program Approval:
Project Completion Date: 6/30/2012

I. PROJECT TITLE: Demonstrating Sustainable Energy Practices at Residential Environmental Learning Centers (RELCs) – Eagle Bluff (7d-1)

Project Manager: Joe Deden
Affiliation: MN Coalition of Residential Environmental Learning Centers
Mailing Address: • Eagle Bluff, 28097 Goodview Drive
City / State / Zip: Lanesboro, MN 55949
Telephone Number: (507) 467-2437 Cell: (507) 951-8986
E-mail Address: director@eagle-bluff.org
Fax Number: (507) 467-3583
Web Site Address: www.eagle-bluff.org

Location: Aitkin, Cass, Fillmore, Lake, Pine, and St. Louis

| | |
|------------------------------------|--------------------------------------|
| Total ENRTF Project Budget: | OVERALL & EAGLE BLUFF PORTION (7d-1) |
| | ENRTF Appropriation \$350,000 |
| | Minus Amount Spent: \$ 0 |
| | Equal Balance: \$350,000 |

| | |
|-----------------------------|--------------------|
| ALL PORTIONS | |
| 7d-1: Eagle Bluff | \$ 350,000 |
| 7d-2: Audubon | \$ 206,000 |
| 7d-3: Deep Portage | \$ 212,000 |
| 7d-4: Laurentian | \$ 258,000 |
| 7d-5: Long Lake | \$ 240,000 |
| 7d-6: Wolf Ridge | \$ 234,000 |
| TOTAL APPROPRIATION: | \$1,500,000 |

Legal Citation: M.L. 2010, Chp.362, Sec.2, Subd. 7d1

Appropriation Language:

\$1,500,000 is from the trust fund to the commissioner of natural resources for agreements as follows: \$206,000 with Audubon Center of the North Woods; \$212,000 with Deep Portage Learning Center; \$350,000 with Eagle Bluff Environmental Learning Center; \$258,000 with Laurentian Environmental Learning Center; \$240,000 with Long Lake Conservation Center; and \$234,000 with Wolf Ridge Environmental Learning Center to implement renewable energy, energy efficiency, and energy conservation practices at the facilities. Efforts will include dissemination of related energy education.

II. PROJECT SUMMARY AND RESULTS: Eagle Bluff's work plan is for both Eagle Bluff's portion of this project and for the overall management of the project as a whole.

Collectively, six Residential Environmental Learning Centers (RELCs - Audubon Center, Deep Portage, Eagle Bluff, Laurentian, Long Lake and Wolf Ridge) will reduce their carbon footprints while disseminating energy education that focuses on renewable energy, energy efficiency, and conservation options. The centers, supported by Bush and Butler foundations, chose to invest in a professional energy audit utilizing the engineering and consulting firm McKinstry. The audits evaluated existing buildings, technologies, and energy uses at each center's location and resulted in state-of-the-art recommendations for conservation and energy efficiency measures, renewable energy possibilities, and demonstration opportunities. Due to the variations of each center's location the suggested solutions represent a variety of options and make the combined effort important for statewide dissemination. McKinstry's study is the basis for our collective energy investment and education development request.

The ENRTF grant will allow the RELCs to: 1) Increase conservation measures and energy efficiency at each center; 2) invest in renewable energies using appropriate technologies for each center; and 3) conduct multi-faceted educational outreach at all centers. A web consultant will design and construct a website showing each center's energy related information for educational use while providing statewide verification of the engineering and installation results.

Each school, college, and adult that attends a center will be exposed to knowledge about choices, energy, conservation, and options that are important and applicable to their home, family and schools. In 10 years this collective education program would reach 840,000 people and annually affect 596 K-12 schools and 46 colleges.

Specifically at Eagle Bluff we will implement McKinstry recommendations to reduce the energy consumption in our most energy inefficient building by up to 80% and to install solar hot water and photovoltaic systems for demonstration purposes. These improvements will be used during educational activities involving the New ERA—Energy Resource Advisor Program being developed in conjunction with Winona State University. More information about the New ERA program is found in Section VII, DISSEMINATION.

Over ten years, approximately 220,000 participants will benefit from Eagle Bluff programming.

Eagle Bluff will coordinate the collective efforts of the six centers to achieve Results 2, 3, and 4.

III. PROGRESS SUMMARY AS OF: 11/30/2009

IV. OUTLINE OF PROJECT RESULTS:

RESULT/ACTIVITY 1: Implementation of carbon and energy reduction systems for education and demonstration purposes at Eagle Bluff. Budget \$245,000. Completion Date June 30, 2012.

Description: Eagle Bluff is the only RELC located in southeastern Minnesota near the town of Lanesboro. We have about 20,000 users a year and teach them about the ecology of “Bluff Country”.

Overall, the McKinstry Energy Audit for Eagle Bluff documented that all six of our buildings need envelope improvements to both conserve energy and improve energy efficiency. Three buildings are excellent candidates for solar hot water applications with five of the buildings benefiting from instantaneous domestic hot water backup. All four of our more public buildings would benefit from upgrading mechanical air handling and ventilation systems. McKinstry recommends converting our natural gas heating system to either electronic heat storage or geothermal systems depending on the availability of an on-site green electric power source. They recommend the establishment of a small scale wind turbine on-site for educational purposes. Outdoor and indoor lighting improvements will help reduce our electric energy use. And lastly, the sub-metering of all buildings to collect baseline energy use and to monitor improvements.

Our McKinstry audit and subsequent recommendation confirmed that our oldest buildings are indeed our most energy in-efficient buildings. The target of our LCCMR work plan is the Eagle Bluff’s residence which was built in 1973. The retrofitted building will become the centerpiece for our Energy Resource Advisor (ERA) educational activities.

We have assembled a design and builder team with remodeling and energy related experience and have been meeting since the spring of 2008 and plan to have finished plans by July 2010. The funding for the design phase came for internal Eagle Bluff funds and a \$15,000 grant from the Beim Foundation.

Our plans are to improve the envelope utilizing the Cold Climate Housing Research Center’s recommendations including the re-establishment of a continuous air barrier in the walls and ceilings. All windows and door will be replaced with high efficiency units. Plans include installing a heat recovery ventilator to achieve good interior air quality and to prevent mold.

We also plan to install solar hot water and solar photo-voltaic panels.

Monitoring equipment is already in place to establish base data and monitor improvements.

The reasons these improvements were chosen from the McKinstry report is because they: 1) have the ability to reduce Eagle Bluff’s carbon production considerably while improving efficiency, 2) utilize a renewable energy source (solar), and 3) serve as a visible demonstration for educating users on the benefits of energy conservation and efficiency, and renewable energy.

Summary Budget Information for Result/Activity 1:

| | |
|----------------------|-----------|
| ENRTF Budget: | \$245,000 |
| Amount Spent: | \$ 0 |
| Balance: | \$245,000 |

| Deliverable/Outcome | Completion Date | Budget | Estimated Carbon Reduction (#s) |
|--|-----------------|-----------|---------------------------------|
| 1-1 Envelope & Mechanical Improvements will be completed | 12/31/10 | \$170,000 | 7,755 |
| 1-2 Solar Hot Water will be installed | 12/31/10 | \$25,000 | 6,000 |
| 1-3 Solar Photovoltaic will be installed | 12/31/10 | \$50,000 | TBD depending on size |

Result Completion Date: *June 31, 2012*

Result Status as of 1/15/2011:

Result Status as of 7/15/2011:

Result Status as of 1/15/2012:

Result Status as of 7/15/2012:

Final Report Summary: *7/15/2012*

RESULT/ACTIVITY 2: Measurement and oversight as a basis for education and information sharing. Budget \$30,000 Completion Date June 30, 2012

Description: Overall Project Coordination: Managing architect - Kirk Program Management, Inc. (KPM) who supervised the McKinstry Study will help all six centers prioritize their energy projects matching their needs with current technologies, provide advice for contracting for design and construction services, review and critique proposed design solutions and perform periodic on-site observations of the work in progress and contribute updates, provide background information for the website and education materials.

Summary Budget Information for Result/Activity 2:

| | |
|----------------------|----------|
| ENRTF Budget: | \$30,000 |
| Amount Spent: | \$ 0 |
| Balance: | \$30,000 |

| Deliverable/Outcome | Completion Date | Budget |
|--|-----------------|----------|
| 2-1 Scope of Work & Technical Teams will be established for each center. Centers will be assisted in going out for, receiving, and evaluating procurement options. | 12/31/10 | \$20,000 |
| 2-2 Progress on Work Plans will be monitored at each center. | 6/31/2012 | \$10,000 |

Result Completion Date: *June 30, 2012*

Result Status as of 1/15/2011:

Result Status as of 7/15/2011:

Result Status as of 1/15/2012:

Result Status as of 7/15/2012:

Final Report Summary: 7/15/2012

RESULT/ACTIVITY 3: Development of significant public education on energy choices. Budget \$60,000 Completion Date June 2011

Description: Overall Project Coordination: Eagle Bluff will coordinate the development of appropriate K-12 curriculum and activities, on-site signage, take-home materials, web interaction and the development of center specific workshops and training seminars will be completed under the guidance of an educational consultant.

3.1 Lessons on Sustainability and Renewable Energy delivered at each RELC

We will develop, pilot test, and teach classes centered on renewable energy and sustainable lifestyles. These lessons will be large-group presentations and interactive classes for groups of 15-20 students, all of varying time lengths to fit each RELC's needs.

3.2 Participation in sustainable lifestyle activities at the RELC.

As part of the lessons being designed, all students will be asked to live a more sustainable lifestyle during their RELC visit. This may include, but is not limited to: reducing food waste, composting food, reducing electricity use, reducing water use, recycling, etc.

3.3 Interactive web-based tools

We will develop and maintain interactive web tools to complement the pre- and post-visit lessons that students will complete at their own school before and after their visit to the RELC. This curriculum will be a matching in-kind donation to the program.

3.4 Assessment

We will develop and implement an assessment tool that will measure the change in behavior and/or knowledge of students who participate in our program.

Summary Budget Information for Result/Activity 3:

| | |
|----------------------|----------|
| ENRTF Budget: | \$60,000 |
| Amount Spent: | \$ 0 |
| Balance: | \$60,000 |

| Deliverable/Outcome | Completion Date | Budget |
|--|------------------------|---------------|
| 3-1 K-12 curriculum will be developed | 6/30/2011 | \$40,000 |
| 3-2 On-site signage recommendations will be completed, designed and printed | 6/30/2011 | \$4,000 |
| 3-3 Interactive web-based tools will be developed and implemented | 6/30/2011 | \$6,000 |
| 3-4 Assessment Tools will be developed | 6/30/2011 | \$10,000 |

Result Completion Date: *June 30, 2012*

Result Status as of 1/15/2011:

Result Status as of 7/15/2011:

Final Report Summary: 7/15/2012

RESULT/ACTIVITY 4: Establish and maintain center specific websites to share information and knowledge with all interested individuals and groups. Budget \$15,000 Completion date June 2012.

Description: Overall Project Coordination: The centers are committed to collecting real time data that can be used on their websites and also for research on the efficiency of the various selected solutions. It will also be used to monitor the results of construction and the accuracy of projections. The websites will have similar background information, photos and essays on the project as it develops, and real time monitoring of the energy savings. The six individual center sites will be linked together.

Summary Budget Information for Result/Activity 4:

| | |
|----------------------|----------|
| ENRTF Budget: | \$15,000 |
| Amount Spent: | \$ 0 |
| Balance: | \$15,000 |

| Deliverable/Outcome | Completion Date | Budget |
|--|------------------------|---------------|
| 4-1 Web consultant will be selected & appropriate technologies will be determined | 9/1/2011 | \$3,000 |
| 4-2 Center websites will be upgraded | 7/15/2011 | \$10,000 |
| 4-3 State-wide composite site recommendations will be completed | 1/15/2012 | \$2,000 |

Result Completion Date: *June 30, 2012*

Result Status as of 1/15/2011:

Result Status as of 7/15/2011:

Result Status as of 1/15/2012:

Final Report Summary: 7/15/2012

V. TOTAL ENRTF PROJECT BUDGET:

Contracts: \$101,000

Overall Project Coordination \$30,000 Ron Kirk, Kirk Program Management Technical Advice

K-12 Curriculum development \$40,000. The professional contractors will be determined through a competitive bidding process.

Interactive web-based tool design \$6,000 The professional contractors will be determined through a competitive bidding process.

Assessment tools development \$10,000 The professional contractors will be determined through a competitive bidding process.

Web Development \$15,000 The professional contractors will be determined through a competitive bidding process.

Supplies: \$4,000

On-Site Signage \$4,000. On-site signage will be determined by the successful curriculum consultant hired in consultation with the project members.

Capital Improvements: \$245,000

TOTAL ENRTF PROJECT BUDGET: \$350,000

Explanation of Capital Expenditures Greater Than \$3,500:

Envelope and Mechanical Improvements \$170,000 (60% materials, 40% installation)

Solar Hot Water \$25,000 (60% materials, 40% installation)

Solar Photovoltaics \$50,000 (60% materials, 40% installation)

The capital improvements made with these funds indicated above are fixed capital assets and will remain in place and will continue to be used for the same program through its useful life.

VI. PROJECT STRATEGY:

A. Project Partners: Audubon Center, Sandstone; Deep Portage, Walker; Eagle Bluff, Lanesboro; Laurentian, Britt; Long Lake, McGregor; and Wolf Ridge, Finland.

| | |
|-----------------------------|--------------------|
| 7d-1: Eagle Bluff | \$ 350,000 |
| 7d-2: Audubon | \$ 206,000 |
| 7d-3: Deep Portage | \$ 212,000 |
| 7d-4: Laurentian | \$ 258,000 |
| 7d-5: Long Lake | \$ 240,000 |
| 7d-6: Wolf Ridge | \$ 234,000 |
| TOTAL APPROPRIATION: | \$1,500,000 |

B. Project Impact and Long-term Strategy: The RELCs sustainable energy campaign has two phases or main goals. Phase 1 is to retrofit our campuses using conservation, efficiency, and renewable resources to reduce the RELCs collective carbon emissions by 80% and lower energy costs. The ENRTF funds will be used to implement one quarter of the Phase 1 goal and sets the stage for our Phase 2 educational programs. The Eagle Bluff will continue to seek funds until all of the Phase 1 work identified in the McKinstry report is completed.

Phase 2 is to create and implement education efforts that compliment the building improvements done in Phase 1, thus using the campuses as models for sustainable retrofitting and practical carbon-neutral lifestyles. The ENRTF funds will allow us to complete a deep energy reduction on the Eagle Bluff residence, adding renewable energy use with solar hot water and solar photovoltaics. The completed project will become the centerplace of educational activities with the ERA-Energy Resource Advisor program.

| B. Funding Sources | Overall RELC Project | Eagle Bluff |
|--|-----------------------------|--------------------|
| LCCMR 2010 Request - Pending | \$1,500,000 | |
| 2009 Federal Allocation - \$300,000/ctr – 5 Northern Ctrs - Pending | | 1,500,000 |
| 2010 Federal Allocation - \$300,000/ctr – 6 ctrs – In Process | | \$1,800,000 |
| MN DEED – Energy Related - Deep Portage - Received | | \$135,000 |
| Federal Stimulus EECBG Grant – Long Lake – Under consideration | | \$100,000 |

C. Other Funds Proposed to be Spent during the Project Period:

| C. Other Funds | Overall RELC Project | Eagle Bluff |
|---|-----------------------------|--------------------|
| In-kind Staff - \$30,000 | | \$5,000 per ctr |
| 2009 Federal Allocation - \$300,000/ctr – 5 Northern Centers | | \$1,500,000 |
| Continue Project Development – Butler Family Foundation | \$30,000 | |

| | | |
|---|--|-------------|
| 2010 Federal Allocation - \$300,000/ctr – 6 ctrs – In Process | | \$1,800,000 |
|---|--|-------------|

D. Spending History:

| D. Spending History | Overall RELC Project | Eagle Bluff |
|--|----------------------|-------------|
| Bush Foundation – McKinstry Study | \$176,000 | |
| Butler Family Foundation – Project Development | \$30,000 | |
| AURI – Biomethane Study at Eagle Bluff | | \$65,000 |
| Beim Foundation - Deep Energy Reduction Design Team at Eagle Bluff | | \$15,000 |
| | | |

VII. DISSEMINATION: Information about this project will be disseminated in Eagle Bluff’s newsletters, email blasts, and annual reports. It will also be discussed in all future New ERA training seminars.

The Energy Resource Advisor (ERA) certificate, developed by Winona State University, is a new curriculum designed to accelerate public understanding of energy efficiency, clean energy, carbon emissions, resource conservation, green technologies, and green jobs. This curriculum is the *first of its kind in Minnesota*. It is a non-credit, continuing education course for adults 18 years of age and older, *using online instructional technology combined with applied, field experience at one of the six RELCs*. Participants in this class will learn about: a) the basic components of an energy audit, b) small-scale renewable energy including site suitability, system sizing, and financial incentives that are available, c) alternative building and transportation options, d) ways to “green up” the home or business, and e) the field of emerging “green” jobs. After completing this course, the successful participant may serve as an energy resource advisor and “green” consultant in the community and workplace.

VIII. REPORTING REQUIREMENTS: Periodic work program progress reports will be submitted not later than 01/15/2011, 7/15/2011, and 1/15/2012. A final work program report and associated products will be submitted between June 30 and August 1, 2012 as requested by the LCCMR.

Project Title: Residential Environmental Learning Center's (RELC's) Sustainable Energy Project - Summary

Dated Material: 6/1/2010

| Attachment A: Budget Detail for 2010 Projects - Summary and a Budget page for each partner (if applicable) | | | | | | | | | | | | | | |
|--|--|---------------------|------------------|--|---------------------|-----------------|---|---------------------|-----------------|---|---------------------|-----------------|------------------|------------------|
| Project Title: Demonstrating Sustainable Energy Practices at Residential Environmental Learning Centers (RELCs) - Eagle Bluff 7d-1 | | | | | | | | | | | | | | |
| Project Manager Name: Joe Deden | | | | | | | | | | | | | | |
| Trust Fund Appropriation: \$1,500,000 Eagle Bluff's 7d-1 Portion: \$350,000 | | | | | | | | | | | | | | |
| 2010 Trust Fund Budget | Result 1 Budget: | Amount Spent (date) | Balance (date) | Result 2 Budget: | Amount Spent (date) | Balance (date) | Result 3 Budget: | Amount Spent (date) | Balance (date) | Result 4 Budget: | Amount Spent (date) | Balance (date) | TOTAL BUDGET | TOTAL BALANCE |
| | <i>Implementation of carbon and energy reduction systems for education and demonstration purposes.</i> | | | <i>Measurement and oversight as a basis for education and information sharing.</i> | | | <i>Development of significant public education on energy choices.</i> | | | <i>Establish and maintain a website to share information and knowledge with all interested individuals and groups</i> | | | | |
| BUDGET ITEM | | | | | | | | | | | | | | |
| Contracts | | | | | | | | | | | | | | |
| Professional/technical | \$0 | \$0 | \$0 | \$30,000 | \$0 | \$30,000 | \$60,000 | \$0 | \$60,000 | \$15,000 | \$0 | \$15,000 | \$105,000 | \$105,000 |
| Capital equipment over \$3,500 | | | | | | | | | | | | | | |
| Conservation - Envelop Improvements 70%materials/30%installation | \$150,000 | \$0 | \$150,000 | | | | | | | | | | \$150,000 | \$150,000 |
| Conservation - Envelop Improvements 70%materials/30%installation | \$20,000 | \$0 | \$20,000 | | | | | | | | | | \$20,000 | \$20,000 |
| Renewables - Solar Hot Water 80%materials/20%installation | \$25,000 | \$0 | \$25,000 | | | | | | | | | | \$25,000 | \$25,000 |
| Renewables - Solar Photovoltaic 80%materials/20%installation | \$50,000 | \$0 | \$50,000 | | | | | | | | | | \$50,000 | \$50,000 |
| COLUMN TOTAL | \$245,000 | \$0 | \$245,000 | \$30,000 | \$0 | \$30,000 | \$60,000 | \$0 | \$60,000 | \$15,000 | \$0 | \$15,000 | \$350,000 | \$350,000 |