

**Environment and Natural Resources Trust Fund
2010 Request for Proposals (RFP)**

LCCMR ID: 206-F

Project Title:

AWMA-UMS K-12 Teacher Environmental Education Workshops

LCCMR 2010 Funding Priority:

F. Environmental Education

Total Project Budget: \$ \$19,200

Proposed Project Time Period for the Funding Requested: 2 years, 2010 - 2012

Other Non-State Funds: \$ \$1,920

Summary:

Volunteer members of the A&WMA-UMS provide K-12 Teacher Environmental Education Workshops on Air Quality and Nonpoint Source Pollution Prevention using A&WMAs award-winning, activity-based curriculum that incorporates classroom and outdoor activities.

Name: Chandler Taylor

Sponsoring Organization: A&WMA - Upper Midwest Section

Address: c/o Barr Engineering Company; 4700 W 77th Street
Minneapolis MN 55435

Telephone Number: (952) 832-2621

Email: ctaylor@barr.com

Fax: _____

Web Address: www.awma-ums.org

Location:

Region: Statewide

County Name: Statewide

City / Township:

_____ Knowledge Base	_____ Broad App.	_____ Innovation
_____ Leverage	_____ Outcomes	
_____ Partnerships	_____ Urgency	_____ TOTAL

MAIN PROPOSAL

PROJECT TITLE: Air & Waste Management Association – Upper Midwest Section K-12 Teacher Environmental Education Workshops

I. PROJECT STATEMENT

The Air & Waste Management Association (A&WMA) believes that environmental education needs to be a continuous process that is both lifelong and forward-looking. A&WMA members believe that one of the best ways to achieve their goal of a clean and healthy environment is to improve the environmental literacy of our youth. As future decision-makers and voters, students need to be exposed to factual information about the environment, including pollution prevention, so they can make responsible, informed environmental decisions - now, and in the future.

K-12 teachers have expressed a need for tools and training that they can use in their classroom to deliver current environmental concepts in a hands-on way. One of the main obstacles to that training is the cost of participating in training and the cost of substitute stipends.

The goal of the Air & Waste Management – Upper Midwest Section (A&WMA-UMS) K-12 Teacher Environmental Education Workshops is to provide environmental concepts and tools to Minnesota teachers that will help students increase their understanding of the effects of climate change and contamination on natural resources – including air, surface water, ground water, and land – and how positive resource management decisions can reduce the impact of those effects. The A&WMA curriculum uses a combination of classroom and outdoor activities to deliver environmental concepts that meet LCCMR priorities:

Environmental Education Priority	A&WMA-UMS Teacher Workshop Characteristic
Increase knowledge about natural and human systems and their interactions, and provide skills to make informed decisions and take responsible actions	<u>Air Quality</u> : air pollutants, sources, climate change, acid rain, ozone, indoor air pollutants, the greenhouse effect, auto emissions, alternative fuels, and pollution prevention devices and approaches <u>Nonpoint Source Pollution Prevention</u> : agriculture, mining, forestry, and urban impacts on water quality and sediments
Innovative delivery	Hands-on, activity-based curriculum developed and updated by 8,000-person organization of environmental professionals
Leverage	Each workshop for 10-15 teachers ultimately impacts thousands of students
Evaluation plan tied to clear and measurable outcomes	Hands-on activities provide opportunity to observe and discuss the concepts; teacher feedback provides information on the ability to translate to the classroom

II. DESCRIPTION OF PROJECT RESULTS

Result 1: Delivery of Teacher Training Workshops **Budget:** \$ 19,200

Since teachers need environmental education materials that are easy to incorporate into their daily lessons, A&WMA's members decided in 1991 to take an active role in this level of environmental education by developing a Teacher-Training Program. At the heart of the

teacher-training program is the A&WMA environmental educational curriculum, the Environmental Education Resource Guides (ERGs).

The ERG series is designed to develop critical thinking skills including observation, comparison, analysis, and problem solving. Each of the lesson plans found in the ERGs have been written and field-tested by classroom teachers. In addition, the content has been extensively reviewed for technical accuracy by A&WMA's Education Council, its members and other leading experts.

A sample workshop agenda and activity are included in Attachment #4

The three primary activities involved in the project are 1) advertising and recruiting teachers to participate in the workshops, 2) scheduling and preparing for the workshops, and 3) conducting the workshops. We will conduct a workshop approximately every two months through the grant period.

The costs associated with the project include the cost of teacher substitute stipends, the cost of renting space for conducting the workshops (when school space is not available), and the cost of advertising and mailings in order to recruit teacher participants. Based on available budget, the A&WMA-UMS can provide matching funds of approximately 10%. A substantial portion of additional, un-quantified matching funds (above and beyond the 10% match) will be provided in the form of volunteer time by the Education Committee and Section members in preparing for and conducting the workshops.

III. PROJECT STRATEGY

A. Project Team/Partners

Under this project, members of the A&WMA-UMS Education Committee will deliver teacher workshops using the ERGs to teachers in Minnesota. The committee consists of environmental professionals from 3M, Polaris Industries, Metropolitan Council Environmental Services, and Minnesota-based environmental consultants. They will be involved in promoting the workshops, recruiting teacher participants, and delivering the workshop curriculum. The participation of the A&WMA-UMS Education Committee in the delivery of the workshops is on a volunteer basis, therefore there is no cost of labor or benefits in the application.

B. Timeline Requirements

Between 2000 and 2005, the teacher workshops were provided under a Twin Cities Water Quality Initiative grant from the Metropolitan Council Environmental Services (MCES). During that time, A&WMA-UMS, in conjunction with Cairn & Associates and the Minnesota Section of the Central States Water Environment Association, conducted 21 workshops for a total of 445 teacher attendees. The attendees included public, private, and home school teachers. The grant period ended in 2005 and this request is being made in order to support 10 workshops between July 2010 and July 2012.

C. Long-Term Strategy

The long-term strategy is to deliver ongoing workshops, incorporating curriculum updates implemented by the A&WMA National Education Committee.

Project Budget

Project Title: A&WMA-UMS K-12 Teacher Environmental Education Workshops

IV. TOTAL PROJECT REQUEST BUDGET (2 years)

<u>BUDGET ITEM</u>	<u>AMOUNT</u>
Personnel:	\$0 (AWMA-UMS Education Committee is all volunteer.)
Equipment/Tools/Supplies: Workshop activity supplies, ERG copies and printing/mailing.	\$ 5,200
Additional Budget Items: Substitute stipends	\$ 12,000
Additional Budget Items: Classroom rental	\$ 2,000
TOTAL PROJECT BUDGET REQUEST TO LCCMR	\$ 19,200

V. OTHER FUNDS

<u>SOURCE OF FUNDS</u>	<u>AMOUNT</u>	<u>Status</u>
Other Non-State \$ Being Applied to Project During Project Period: AWMA-UMS funds are secured at a 10% match.	\$1,920	Secured
Funding History: Funding provided previously under a Metropolitan Council Environmental Services Twin Cities Water Quality Initiative grant.	\$19,750	

Sample Workshop Agenda and Activity

A&WMA has eleven volumes of ERGs. There are four Air Quality ERGs and four Nonpoint Source Pollution Prevention ERGs in English. They are divided by class level using common U.S. classifications: grades K-2, 3-5, 6-8, and 9-12. In addition, the Air Quality grade 6-8 and Nonpoint Source grade 6-8 ERGs have been translated into Spanish, and the Air Quality grade 6-8 ERG has been translated into French.


Each ERG includes approximately 15 lessons with clearly stated educational objectives, background information, hands-on activities, and extension activities that can be integrated into general science, language arts, math, social studies, and other subjects.

Sample Workshop Agenda

Full-Day Workshop
Air Quality and Nonpoint Source Pollution

1. Workshop Registration
2. Introductions, Icebreaker
3. Workshop Goals and Agenda
4. Overview of Teacher-Training Program
5. ERG Activity #1 – Air Quality:
The Dirty Half Dozen
6. Regroup/Discussion
7. ERG Background and Layout
8. Understanding Air Quality
9. ERG Activity #2 – Air Quality:
Let’s Sock Car Exhaust!
10. Regroup/Discussion
11. ERG Activity #3 – Air Quality:
T emperature’s Rising
12. Lunch
13. Understanding Nonpoint Source Pollution Prevention
14. ERG Activity #4 – NSPP: Fertile Green
15. Regroup/Discussion
16. ERG Activity #5 – NSPP: Leachate Legacy
17. Q & A, Feedback, Closing Remarks
18. Workshop Evaluation, Distribute ERGs

Teachers participating in the workshops receive copies of the ERGs, information on their use, background on the key environmental concepts, and hands-on practice of several activities. As a result, the concepts and activities can be directly and immediately applied within their own classroom without significant additional preparation or research.



AIR & WASTE MANAGEMENT
ASSOCIATION
SINCE 1907

TEMPERATURE'S RISING

OBJECTIVES

The student will do the following:

1. Explain how the Greenhouse Effect is capable of changing the climate of the earth.
2. Describe how a greenhouse gas works.
3. Identify the sources of the increasing amounts of carbon dioxide (CO₂) in the earth's atmosphere.

BACKGROUND INFORMATION

Carbon dioxide is a by-product of most living things and many commercial processes. Organisms "burn" food (fuel) to release the energy required for life activities. Carbon dioxide is a waste product of this process. When humans burn fossil fuels (fuels such as coal and oil formed by plants millions of years ago), CO₂ is also given off. Today we use huge amounts of energy (fuel) for transportation and industry. Concern is growing about the large amount of CO₂ that is building up in the atmosphere as fossil fuels are burned. Such an increase in atmospheric CO₂, along with increases in other gases such as CFCs (chlorofluorocarbons), could lead to an increase in the average temperature of the earth. This is known as the "Greenhouse Effect."

Carbon dioxide differs from nitrogen (N₂) and oxygen (O₂), the two main gases in our atmosphere, because it absorbs infrared radiation (heat) emitted by the earth, causing the temperature of the earth to increase. The Greenhouse Effect can be observed in parked cars in the sun or in greenhouses made mostly of glass. The glass in the windows is transparent to visible light. This light heats the surface it shines on. Then, the hot surfaces emit infrared radiation, which does not penetrate the glass and is trapped, causing the inside of the cars (or greenhouses) to warm up. The theorized warming of the earth is certainly not as dramatic as the heat gain in parked cars, but is nonetheless a real concern.

Studies have shown that since 1890 the amount of CO₂ in the earth's atmosphere has been increasing. The following table shows this increase:

DATE	CO ₂ (ppm)
1890	270
1958	313
1988	347

SUBJECTS:
Science, Mathematics

TIME:
1-2 class periods

MATERIALS:
dry ice (science department at local college or high school or local businesses are possible sources; store in an ice chest and break into small pieces before use)
CAUTION: Do not handle dry ice with bare hands. Use gloves.
4 or 5 light sources (lamps with 100-watt bulbs or 3-way reading lights turned to highest wattage)
For each student group:
watch or timer
2 clear glass bottles with lids that fit tightly
2 small thermometers that fit inside the glass bottles (aquarium thermometers work nicely)
student sheets (included)

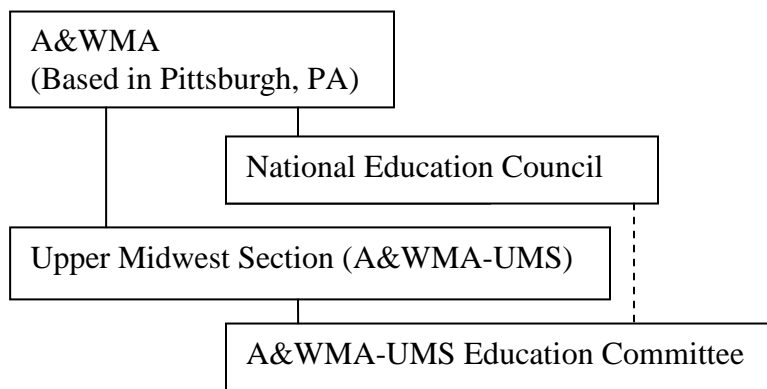
Organization Description and Project Manager Qualifications

AWMA-UMS Education Committee

The Air & Waste Management Association (A&WMA) is a nonprofit, nonpartisan professional organization that enhances knowledge and expertise by providing a neutral forum for information exchange, professional development, networking opportunities, public education, and outreach to more than 8000 environmental professionals in 65 countries. The A&WMA membership consists of environmental managers and decision-makers from industry, consultants, engineers, scientists, state regulators, professors, researchers, and students. A&WMA promotes global environmental responsibility and increases the effectiveness of organizations to make critical decisions that benefit society. In 2007, A&WMA celebrated its 100th year of environmental stewardship. For more information on A&WMA, please visit www.awma.org.

*The **Mission** of A&WMA is to assist in the professional development and critical environmental decision-making of our members to benefit society.*

*The core **Purpose** of A&WMA is to improve environmental knowledge and decisions by providing a neutral forum for exchanging information.*



A&WMA offers a variety of products and services to help meet the professional development and educational needs of environmental professionals, university students, grades K-12 students and teachers, and the general public. Members of A&WMA's Education Council provide input into the development of these products and services and often play a key role in their delivery and dissemination.

The A&WMA-UMS Education Committee will be responsible for conducting the teacher workshops and managing the grant funds, if successful. All committee members participate on a volunteer basis because they believe in the educational mission of A&WMA. Participants on the Education Committee represent 3M Corporation, Polaris, Metropolitan Council Environmental Services, and Minnesota-based environmental consultants. All participants have the support of their respective employers to participate in the committee and workshops.

Project Manager

Chandler Taylor is a project manager at Barr Engineering Company where he leads multi-disciplinary projects related to environmental permitting and compliance. Mr. Taylor is responsible for coordinating the activities of the A&WMA-UMS Education Committee.