1995 Project Abstract
For the Period Ending June 30, 1997
This project was supported by Oil Overcharge Money, LM 95 Chp 220, Sec 19, Subd. 6(l)

TITLE: **Interactive Computer Exhibit on Minnesota Renewable Energy Sources, no. M3 19**

Project Mgr: William B. Grant
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Legal Cit: LM 95 Chp 220, Sec 19, Subd. 6(l)
Appropriation: $150,000.00

Statement of Objectives:

This appropriation has been used to develop an interactive multimedia computer exhibit on renewable energy resources in Minnesota. In accordance with the Minnesota Environmental Education Plan, users of the CD-ROM will:

1. learn about the environmental impact of energy use and power generation in the state;
2. learn about alternatives presented by renewable energy sources;
3. understand the economic and environmental impact of these alternatives;
4. gain information to make informed decisions about energy use and power generation.

Overall Project Results:

2,500 CD-ROMS, entitled Power to Spare: Minnesota's Renewable Energy Resources, were produced. Producing the CD-ROM included the following steps:

1. Needs Assessment: Focus groups and interviews with fifth and sixth grade teachers and students were conducted to identify important components to be incorporated in the CD-ROM, such as puzzles and games, create your own story comic book, and a research activity. Additional focus groups were also conducted during development to test the effectiveness of the presentation on student learning.
2. Technical Information Development: The scope of the informational content was defined by existing curricula and focus group findings. The program content was geared to fifth and sixth grade students. The information is conveyed through words, pictures and video footage.
3. Development of the Computer Courseware: The setting of the course is a newsstand. Informational content is presented through articles published in magazines displayed in the newsstand. Access to the information is provided by browsing through the magazines that are shown on the newsstand shelves; a research game in which the user is directed to hunt for information in the articles; puzzles, mazes and word games related to each of the magazine articles; and an interactive comic book. The CD-ROM will run on both Windows and Apple supported computers.

Note: The best way to assess the results of this project are to view the CD-ROM as intended. The extent of the information and the variety of ways in which that information is conveyed will be very evident.

Project Results Use and Dissemination:

The CD-ROM is now on display in a computer kiosk in the Our Minnesota Hall in the Science Museum of Minnesota. The CD-ROM will also be disseminated to students in elementary and middle schools through a variety of mechanisms, including Science Museum's educational conferences and the Energy Connections School Outreach Program. The Museum staff projects that during 1997 through 1999 1,600 CDs will be distributed to over 3,000 teachers. In addition to these efforts, the League will also be working with environmental educators to disseminate additional copies of the CD as well as through other League networks. The CD was well received when it was displayed at the League's national convention this summer.

Date of Report: September 8, 1997.

LCMR Work Program 1995

I. Project Title and Project Number: Interactive Computer Exhibit on Minnesota Renewable Energy Sources, no. M3 19

Project Manager:	William B. Grant
Agency Affiliation:	Midwest Office Izaak Walton League of America
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A. Legal Citation: ML 95, Chp. 220, Sec. 19, Subd. 6(i).

Total biennial LCMR appropriation:	$150,000.00
Balance:	$0.00

Appropriation Language: This appropriation is from oil overcharge money to the commissioner of administration for an agreement with the Izaak Walton League of America, Midwest Office in cooperation with the Science Museum of Minnesota to develop and disseminate an interactive multimedia computer exhibit on renewable energy resources.

B. Status of Match Requirement:

Match Required:	N/A
Amount Committed to Date:	N/A
Match Spent to Date:	N/A

II. Project Summary: The economic and environmental opportunities gained by utilizing the renewable energy resources of Minnesota will be presented through an interactive, multimedia computer exhibit displayed at the Science Museum of Minnesota. In accordance with the Minnesota Environmental Education Plan, students and the general public will:

1. learn about the environmental impact of energy use and power generation in the state,
2. learn about alternatives presented by renewable energy sources,
3. understand the economic and environmental impact of these alternatives, and
4. gain information to make informed decisions about energy use and power generation.

Using computer graphics and animation, live video, photographic images, and sound, program users will gain an entertaining educational experience while being presented with the subject matter.

The program will be placed on public display in a computer kiosk in the "Our Minnesota: Changing Landscapes" exhibit at the Science Museum of Minnesota. The display will reach over 800,000 people annually in the upper midwest and will be a powerful tool in helping

people examine the potential economic and environmental benefits of Minnesota's renewable energy resources. The computer program will be made available to schools for use on Macintosh or PC/Windows computers and will be disseminated through: a. teacherworkshops at the Science Museum, b. information published in the Science Museum publication "Boghopper" which is mailed to teachers throughout Minnesota three times a year, and c. the distribution efforts of the Office of Environmental Assistance Clearinghouse. The program will be made available on CD-ROM and floppy diskette versions.

III. Six Month Work Program Update Summary: Objective A has been completed. Objective B has been completed. Objective C has been completed.

IV. Statement of Objectives:

A. Development of the Informational Content of the Program: The technical content of the program will be researched and developed. An important aspect of this objective will be a thorough needs assessment of the target audience (grade 6-12 students,visitors of the Science Museum, and the general public). The needs assessment will determine the scope and learning objectives of the course. This activity includes clearly defining the target audience, measuring their current level of knowledge about the subject matter, and identifying the major points of the course that should be presented. This will drive the research and development of the technical content of the exhibit. This objective will also include determining the different options and choices that will be presented as part of the interactive role-playing aspects of the program and ensuring that the materials presented are accurate and appropriate.

B. Production of the Interactive Computer Program: Computer program development will include: devising the storyboards; scripting and editing the text of the course; producing and acquiring the necessary artwork, computer graphics, animation, video, and photographic images; and programming the computer software. The course will be evaluated through focus groups and testing on the Science Museum floor and in selected schools.

C. Dissemination of the Interactive Computer Program: The program will be placed on public display in a computer kiosk in the "Our Minnesota: Changing Landscapes" exhibit at the Science Museum of Minnesota. The interactive educational computer tool will be disseminated through: a. teacher workshops at the Science Museum, b. information published in the Science Museum publication "Boghopper" which is mailed to teachers throughout Minnesota three times a year, and c. the Office of Environmental Assistance Clearinghouse.

Timeline for Completion of Objectives:

	7/95	1/96	6/96	1/97	6/97
Objective A	xxxxxxxxxxxxx				
Development of the Informational Content of the Program					
Objective B		xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx			
Production of the Interactive Computer Program					
Objective C				xxxxxxxxxxxxxxxxx	
Dissemination of the Interactive Computer Program					

V. Objectives/Outcome:

A. Title of Objective/Outcome: Development of the Informational Content of the Program

A.1. Activity: Needs assessment

A.1.a. Context within the project: The development of an effective interactive educational computer tool requires a thorough needs assessment of the target audience (grade 6-12 students,visitors of the Science Museum, and the general public).

A.1.b. Methods: The needs assessment will determine the scope and learning objectives of the course. This activity includes clearly defining our target audience, measuring their current level of knowledge about the subject matter, and identifying the major points of the course that should be presented. This will drive the research and development of the technical content of the exhibit.

The needs assessment of the target audience will be performed through focus group and facilitated discussion interviews. Both are essentially small discussion groups whose members are carefully selected to represent a specific population. These methods will be employed to learn about the needs and opinions of youth and classroom teachers whose views may not be adequately represented in other data collection formats. Participants will be encouraged to share their opinions about using an interactive computer program relating to renewable energy resources. Teachers and students will be recruited through different school systems. This selection process will be designed to promote participation by teachers and students with diverse experiences, a critical component in designing and evaluating a successful interactive computer program.

A.1.c. Materials: N/A

A.1.d. Budget

Total biennial LCMR Budget:	$6,000.00
LCMR Balance:	$0.00
MATCH:	N/A
MATCH Balance:	N/A

A.1.e. Timeline:

	7/95	1/96	6/96	1/97	6/97
PRODUCT 1 Needs assessment report	xxxxxxxxxxxxxx				

A.1.f. Final status: Focus groups were performed with fifth and sixth grade classes at two elementary schools, Marcy Elementary School in Minneapolis and Oak Point Elementary School in Eden Prairie. Preliminary work with the school children identified important components to be incorporated in the CD-ROM, such as puzzles and games, create your own story comic book, and a research activity. Findings from these sessions were summarized in a report that is attached to this final report.

In addition, a temporary computer kiosk was set up on the floor of the Science Museum. User interest and participation were observed and monitored at this sites.

A.2. Activity: Technical information

A.2.a. Context within the project: This activity will define the focus of the courseware and produce the technical information which will be presented in the computer program.

A.2.b. Methods: The purpose of this activity will be to identify the topics to be included in the course and research the information to be conveyed. This includes researching the different options and choices that will be presented as part of the interactive role-playing aspects of the program and ensuring that the materials presented in the informational sequences are accurate and appropriate. This activity will build on the work performed by Izaak Walton League for their report Power to Spare in the Upper Midwest. The 1993 Union of Concerned Scientists' (UCS) report, Powering the Midwest: Renewable Electricity for the Economy and the Environment will also serve as an important reference for informational material. The information will be scripted and edited for inclusion into the courseware.

A.2.c. Materials: N/A

A.2.d. Budget

Total biennial LCMR Budget:	$39,000.00
LCMR Balance:	$0.00
MATCH:	N/A
MATCH Balance:	N/A

A.2.e. Timeline:

	7/95	1/96	6/96	1/97	6/97
PRODUCT 1	xxxxxxxxxxxxxxx				
Technical information report					

A.2.f. Final status: A nationwide survey of existing energy education curricula and materials was conducted and revealed a paucity of appropriate resources for school age children. A recently published CD-ROM, "The Sun's Joules" produced by CREST, dealing with renewable energy resources was obtained and reviewed. However, no existing software was found that matched the audience and learning objectives targeted by this project.

The scope of the informational content of the program was defined based on existing curricula and focus group findings. The program content was researched, written and edited by project staff. The complete text of the software is included with this report.

B. Title of Objective/Outcome: Production of the Interactive Computer Program

B.1. Activity: Development of the Computer Courseware

B.1.a. Context within the project: This activity will produce the finished computer courseware that will be made available.

B.1.b. Methods: For this activity, all facets of the courseware will be developed, produced, and programmed into the computer. This will be accomplished according to the following steps.

1. Course Framework Design. This step will develop the general outline and flow of the courseware. The framework of the courseware will be developed and the flow charts for the game and the informational sequences of the course will be composed. This task includes input and review from the educational and technical staff of the project team to ensure that the game presents the information effectively to the intended audience and that the course is congruent with the learning objectives determined as part of the needs assessment. Using the information researched from activity A, storyboards will be developed for each course sequence that detail how the information or decision-making process will be presented.

2. Artwork and Graphic Design. The graphic design of the computer program will be developed. This activity will also develop, produce, and acquire the necessary artwork, animation, computer graphics, photographic images, and illustrations to be used. Graphic artists and designers will produce the background screens and animated sequences that will be used in the courseware. These materials will either be directly produced on the computer or the images will be scanned into the computer and digitally

enhanced for inclusion into the program. Photographs and illustrations will be produced or acquired from existing sources, as necessary. Permission has been obtained to use graphic images generated for reports developed by Izaak Walton League and materials published in the UCS Powering the Midwest report. The availability of materials from other existing sources will also be explored.

3. Video Acquisition and Production. Video footage that will be incorporated into the courseware will be obtained from cooperating participants or will be produced specifically for this project. Existing footage from sources such as the UCS news feed for Powering the Midwest ~~and video libraries accessed through the help of Minnesota Public Television will be edited and incorporated into the courseware, wherever appropriate. Video footage will also be produced from three on-location shoots.~~ As part of this step, the footage will be digitally captured into the computer and edited for use by the computer program. No relevant footage was identified by KTCA staff. Other free sources of video footage have been acquired. The budget dollars allocated for KTCA ($8,000) will be distributed to: B.1.b.1 ($2000), 2 ($1000) and 5 ($2000), B.2 ($2000) and C.1 ($1000).

4. Audio Production and Acquisition. The production or acquisition of voice-overs, background music, and sound effects will be performed. Royalty-free music will be obtained from public domain pre-recorded audio CD's, as necessary, and where needed, music will be composed, recorded, and digitized by project staff. The voice-overs will be scripted, readings will be recorded, and recordings will be digitized into the computer and added to the game. Sound effects will either be obtained from public domain pre-recorded audio CD's or will be recorded and digitized by project staff. The audio portions will then be added to the courseware.

5. Programming of Computer Course. The computer program will be written based on the framework developed under step 1 of this activity. Text, artwork, computer graphics, animation, video, audio, and photographic images will be programmed into the informational and role-playing sequences of the courseware. Each sequence will be programmed into the overall structure of the course.

6. Evaluation. The computer program will be evaluated by how well the courseware has achieved the learning objectives set forth by the needs assessment and how well the courseware has attracted and maintained the interest of the target audience. The program will be continuously tested with small focus groups of grade school age youth. Beta-version testing of the software will also be performed on the floor of the Science Museum of Minnesota Green Street Exhibit and in selected schools. The results of this evaluation will be used to guide the final editing and refinement of the courseware.

B.1.c. Materials: N/A

B.1.d. Budget

Total biennial LCMR Budget:	~~$90,000.00~~	$87,000.00
LCMR Balance:	~~$70,774.71~~	$0.00
MATCH:	N/A	
MATCH Balance:	N/A	

B.1.e. Timeline:

	7/95	1/96	6/96	1/97	6/97
PRODUCT 1	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx				
Framework and storyboards					
PRODUCT 2		xxxxxxxxxxxxxxxxxxxxxxxxxxxx			
Artwork and graphic design					
PRODUCT 3		xxxxxxxxxxxxxxxxxxxxxxxxxxxx			
Video production					
PRODUCT 4		xxxxxxxxxxxxxxxxxxxxxxxxxxxx			
Audio production					
PRODUCT 5		xxxxxxxxxxxxxxxxxxxxxxxxxxxx			
Computer program					
PRODUCT 6			xxxxxxxxxxxxxxxxx		
Evaluation report					

B.1.f. Final status: The interactive CD-ROM was developed and produced for fifth and sixth grade school age children. Entitled "Power to Spare, Minnesota's Renewable Energy Resources," the CD-ROM deals with the environmental and economic benefits of renewable energy in Minnesota.

The setting of the course is a newsstand. Informational content is presented through articles published in the magazines displayed in the newsstand. Access to the information is provided by browsing through the magazines that are shown on the newsstand shelves; a research game in which the user is directed to hunt out information in the articles; puzzles, mazes, and word games related to each of the magazine articles; and an interactive comic book. Two copies of the CD-ROM are included. Please note: The CD-ROM does have sounds associated with the games and articles; however, there is no narrative audio on the CD-ROM. Limited audio was recommended by the staff of the Science Museum and by teachers. In the Science Museum setting it is too loud to hear many sounds that are normally contained on CD-ROMS. In the school setting, the most likely place the CD-ROM will be used is in the computer lab and teachers told us that most often the volume on computers in the labs is turned off in order to maintain a reasonable learning environment.

The sources for photographs and video footage included in the CD-ROM are cited in the acknowledgments section of theCD-ROM and included in the text copy attached to this final report.

A public testing of the courseware at the 1996 Minnesota State Fair was performed. User interaction with a kiosk displayed in a public setting presented time and interest constraints not associated in a school computer lab setting. While the game has some utility in this application, a deeper learning experience will be achieved in the school setting.

Pre- and post-use evaluation was conducted in selected schools using an abridged version created for pilot testing. Results from this testing refined the final design of the CD-ROM. A copy of the evaluation final report is included.

B.2. Activity: Production of CD-ROM and Diskette Versions

B.2.a. Context within the project: In order to make the software accessible to the intended audience, the computer program must be reproduced onto a format that can be readily distributed.

B.2.b. Methods: The computer program will be made available for use on Macintosh or PC/Windows computers and will be distributed in two formats, on CD-ROM and as a floppy diskette version. The program will initially be downloaded onto an external hard drive which will allow the program to be directly copied onto computers that will be used to display the courseware and will act as backup storage of the master version of the program. The hard drive also will be used by the CD-ROM mastering and duplication house to produce copies of the program on CD-ROM. An abridged version of the software that can be copied onto a manageable number of floppy diskettes will also be produced. This allows for the distribution of a version of the program to interested parties who do not have access to CD-ROM computer capabilities.

B.2.c. Materials: An external hard drive will be purchased for storage of the master version used for CD-ROM duplication. The cost of an external hard drive of sufficient strorage capacity will be $800.00. The hard drive will be left with the Science Museum at the completion of the two year project to serve as backup storage for the courseware.

B.2.d. Budget

Total biennial LCMR Budget:	~~$3,000.00~~	$5,000.00
LCMR Balance:	~~$3,000.00~~	$0.00
MATCH:	N/A	
MATCH Balance:	N/A	

B.2.e. Timeline:

	7/95	1/96	6/96	1/97	6/97
PRODUCT 1			xxxxxxxxxxxxxxxxx		
CD and disk production					

B.2.f. **Final status:** A total of 2,500 CD-ROMs were produced and packaged for distribution to schools and interested parties. The CD-ROM can be used on Apple Macintosh and Windows (either Windows 3.1 or Windows 95) machines.

System requirements:

Double speed CD-ROM drive
5MB of free application RAM
Color monitor set at 256 colors (8 bit).

Apple Macintosh ® computers:

Mac OS 7.1 or later
QuickTime™ version 2.1 or later
68040/PowerPC™ processor.

Windows ® computers:

Microsoft Windows ® (3.1 or later)
QuickTime™ for Windows ® version 2.1.2 or later
Intel 80486/Pentium™ processor (Pentium™ processor recommended).

C. Title of Objective/Outcome: Dissemination of the Interactive Computer Program

C.1. Activity: Display and Distribution of the Interactive Courseware

C.1.a. **Context within the project:** This activity will make the interactive courseware available to the target audience of the project, (grade 6-12 students,visitors of the Science Museum, and the general public).

C.1.b. **Methods:** The program will be placed on public display in a computer kiosk in the "Our Minnesota: Changing Landscapes" exhibit at the Science Museum of Minnesota. This activity includes the design, acquisition of equipment, and construction of the kiosk. Public display of the courseware will also be provided by the OEA. Currently the OEA own seven computer kiosks which are loaned to malls, libraries, schools, and businesses for the display of existing OEA educational software. This project has been given access to these kiosks on an as-needed and as-available basis. To gauge the use of the software, counters will be added to the program to keep track of usage by the target audience.

The interactive educational computer tool will be disseminated through: a. ~~teacher workshops at the Science Museum~~, various existing avenues in the Science Musuem's education division. These avenues are outlined in a dissemination plan prepared by the Science Museum. Given the later than anticipated completion date for the CD-ROM, there is no time for the Science Museum to distribute this program during the remainder of its current fiscal year (July 1, 1996-June 30, 1997). Consequently, this plan looks toward next fiscal year and beyond to define how the CD-ROM will be effectively distributed to teachers throughout Minnesota. The avenues of distribution include a Science Museum-sponsored annual environmental education conference directed at teachers; annual science teachers' conferences; and, the Energy Connections School Outreach program, which provides a day-long program to schools about energy. In order to ensure that the CD-ROM is distributed widely and then actually used by teachers, it is important that teachers have sufficient introduction and familiarity with the CD-ROM. Repeated discussions with teachers, conclusions drawn from the courseware evaluation in schools and the Science Museum school outreach staff indicate that teachers are unlikely to use a CD in their classroom unless they have received sufficient introduction and training in the operation and content of the CD-ROM. The Energy Connections program is anticipated to reach 1,200 teachers during 1998. In order to adequately demonstrate the CD-ROM in the variety of schools served by Museum on the Move, the Science Museum would require the purchase of two portable laptop computers and a portable projection system. This equipment will enable theSchool Outreach staff to demonstrate The CD-ROM in an engaging manner to groups of teachers and would ensure much broader use in the schools, b. information published in the Science Museum on-line publication "Boghopper" ~~which is mailed to teachers throughout Minnesota three times a year,~~ and c. the efforts of the Office of Environmental Assistance via OEA mailings, teacher workshops, and displays at conferences. The OEA will also make available through their Clearinghouse the ~~diskette versions~~ CD-ROM of the courseware. The ~~diskettes~~ CD-ROM will be distributed to interested parties on a loan basis, similar to the procedures currently in place for their own educational software. Attendance at the workshops and direct orders for the CD-ROM ~~and diskette versions of the software~~ will be recorded to determine the effectiveness of the dissemination efforts.

C.1.c. **Materials:** Materials for the construction of the kiosk at the Science Museum will be purchased as part of this contract. ~~Given the display life, design requirements, material availability, computer needs, and costs of equipment rental or lease, the decision to purchase is the most economically viable. The total cost for the kiosk (including construction and materials) is $7,000.00. Materials include the purchase of the computer and monitor that will run the program. At the end of the project, the computer will remain in the kiosk and both will be left on the floor of the Science Museum.~~ All the equipment purchased with this appropriation will continue to be used for the same

program through its useful life. If circumstances arise that the use changes, an amount will be paid back to the appropriate Fund equalling either: 1] the cash sale price received from sale of the equipment at that time or 2] a residual value to be negotiated with the director, if the equipment is not sold. The Science Musuem was able to install the CD-ROM in a kiosk in the Green Street's exhibit for a cost of $1,860. In addition, because the dissemination plan of the Science Museum has changed from the original proposal (as described above), teacher workshops were not performed as anticipated. The savings generated from the kiosk construction ($5,140) as well as from the teacher workshops ($5,000) that were not conducted will be used to purchase the computers andprojection equipment that will enable the Museum on the Move to take the CD-ROM across Minnesota and to provide teachers with immediate instruction. The cost for the purchase of the portable computer equipment is $10,316.

C.1.d. Budget

Total biennial LCMR Budget:	~~$12,000.00~~	$13,00.000
LCMR Balance:	~~$12,000.00~~	$0.**00**
MATCH:	N/A	
MATCH Balance:	N/A	

C.1.e. Timeline:

	7/95	**1/96**	**6/96**	**1/97**	**6/97**
PRODUCT 1				xxxxxxxxxxxxxxxxx	
Display and distribution					

C.1.f. Final status: The final version of the computer program was installed on a computer kiosk at the Science Museum of Minnesota and resides on permanent display in the Our Minnesota Hall. The CD-ROM was also on display at the National Convention of the Izaak Walton League in Illinois. Many League members expressed interest in disseminating the CD-ROM in their own communities. In addition, throughout the two years that the CD-ROM has been under development, various environmental educators throughout the Midwest have contacted the League after hearing about the project. All those who have contacted the League and expressed interest will receive a copy of the CD-ROM.

As discussed in the work program amendment of June 26, 1997, because the timetable for CD production coincided with the end of the school year, dissemination as originally planned by the Science Museum was amended to reflect a timetable in line with the school year and favor wider adoption by teachers. A modified dissemination plan has been developed and is summarized above in the C.1.b Methods section. The complete dissemination plan is attached to this final report.

Copies of the CD-ROM were provided to the Office of Environmental Assistance Clearinghouse and the Izaak Walton League of America, Midwest Office, for additional display and dissemination to interested parties.

In addition, project staff plan to explore with other groups across the country the opportunities for expanding the content and scope of the CD-ROM.

VI. Evaluation: Evaluation of the project will take two forms: 1. the evaluation of the effectiveness of the software as performed under step 5 of activity B.1 and 2. usage of the computer kiosks on public display, workshop attendance figures, and orders for the program that will be recorded during the efforts described under activity C.1.

VII. Context within field: This project will provide to students and schools energy education materials developed by non-profit groups with no vested interest in energy production in the state. This project will supplement existing materials by covering topics using an important learning tool (the computer) and by presenting the material in an up-to-date, in-depth way. According to the Catalog of Energy and Environmental Education Resources, only two pieces of software (developed in the mid-1980's) offer material for the computer on renewable energy sources.

This project will aid in accelerating the implementation of energy education goals related to the Minnesota Environmental Education Plan. Specifically, the project provides out-of-classroom experience to students through the exhibition of the program on the Science Museum floor and will promote the dissemination of the program to schools as a direct result of the teacher workshops at the Science Museum, information published in "Boghopper", and the efforts of the Office of Environmental Assistance

VIII. Budget context: A. An activity performed by Izaak Walton League during the 2-year period ending June 30, 1995 was the publication of the report Power to Spare in the Upper Midwest. Sources of funding for this report was from various charitable foundations including the McKnight Foundation and the Pew Charitable Trusts. Also during this period, the Science Museum of Minnesota received funding from NSP, Cowles Media Foundation, the US DOE, the LCMR, and the Association of Science and Technolgy Centers to develop *Green Street*, a permanent exhibit, education, and outreach program dedicated to revealing the links between modern American lifestyles and major energy and environmental issues. B. During the 2-year period beginning July 1, 1995, the LCMR will be funding Twin Cities Public Television to create a resource information center for environmental video and to produce and broadcast an environmental television series about Minnesota environmental achievements.

IX. Dissemination: See activity C.1.

X. Time: N/A

XI. Cooperation: The Izaak Walton League of America (IWLA) will be responsible for project management and coordination of the efforts of the subcontractors. The IWLA will work in

conjunction with ~~the Underground Space Center~~ Lester Shen, consultant, to perform program development and research and will be jointly responsible for the content issues and scripting of the courseware. ~~The Underground Space Center~~ Lester Shen, consultant, will take on primary responsibility for the production of the computer courseware. The Science Museum of Minnesota will assist in the display and dissemination of the courseware and will provide exhibit staff to aid in the production work. ~~Twin Cities Public Television will perform the video production duties including three on location shoots, acquisition of existing footage, and editing of new and existing footage.~~ Effort of the cooperators (in percent of budget) will be:

~~Underground Space Center, University of Minnesota~~ (54%)

Lester Shen, consultant: Since the development of the original workplan, the University of Minnesota closed the Underground Space Center. Since leaving the University, Dr. Shen now works as a private consultant.

Science Museum of Minnesota (15%)

~~Twin Cities Public Television (5%)~~

A search performed by KTCA staff of the the KTCA video library did not result in any relevant footage for this project. We were able to identify other sources of free video footage we which have acquired. The budget amount allocated to KTCA ($8,000) will be used for other purposes as described in this amended workplan. See Section B.1, B.2 and C.1.

Approximately 26% of the budget will cover the efforts of Izaak Walton League staff. The Union of Concerned Scientists and the MInnesota Office of Environmental Assistance will act as advisors and collaborators to the project and their efforts will be provided through in-kind support.

XII. Reporting Requirements:

Semiannual six-month workprogram update reports will be submitted not later than January 1, 1966, July 1, 1996, January 1, 1997, and a final six-month workprogram update and final report by June 30, 1997.

XIII. REQUIRED ATTACHMENT:

1. **Qualifications:**
2. **Project Staffing Summary:**