

AN INTEGRATED COMMUNITY APPROACH TO REDUCING RESIDENTIAL WOODSMOKE: COMMUNITY ANALYSIS AND EDUCATION

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ABSTRACT

The town of Libby, Montana has exceeded the 24-hour and annual PM_{10} standard every year since monitoring began in 1987. Residential woodsmoke is a significant source of Libby's air pollution.

In hopes of avoiding stricter state or federal action, local officials designed a set of voluntary regulations to bring the Libby area into compliance. An aggressive strategy for community support and acceptance was necessary to ensure success of the voluntary program.

This paper offers a case study for developing woodsmoke reduction and community acceptance strategies in an economically challenged community. This approach can be applied to other localized air pollution problems or to other wood-burning communities. Libby's socioeconomic situation is also reviewed, including employment, population, level of income, housing, and recreational facilities.

The high level-of-effort community involvement program includes individuals in community education, schools, businesses, government, and the health and medical field. Also, an element of volunteer contribution appears throughout the program. A timeline showing implementation of the activities within these categories, for the 2 years until possible mandatory compliance, is presented.

INTRODUCTION

Air pollution is a serious problem in and around Libby, Montana. Situated in the Kootenai River Valley, this area forms a natural sink for air that deters atmospheric mixing. As with

similar locations around the country, air pollution stagnates and worsens in the winter when cold, dense air settles in the valley.

The air pollution in Libby is comprised of several ingredients, from harmful gases to small particles. The Libby area frequently violates the National Ambient Air Quality Standards for PM_{10} . Elevated PM_{10} concentrations are found in Libby's air between September and May, with the highest levels between December and April.

The current residential wood-burning regulations in Libby provide for a voluntary curtailment program. Under this program, emissions from all solid fuel burning devices are limited. The regulations state that, if a 60 percent reduction in all Libby area Air Pollution Control District (APCD) emissions cannot be demonstrated by October 1992 after implementation of the voluntary woodsmoke curtailment program, a mandatory woodsmoke curtailment program may be initiated.

In order to avoid a mandatory program, Lincoln County, Montana, commissioned a woodsmoke reduction plan to outline strategies to decrease woodsmoke emissions in Libby in the 2-year timeframe. The plan included an integrated strategy for community acceptance. This paper offers a case study for developing woodsmoke reduction and community acceptance strategies in an economically challenged community.

Sources of Residential Woodsmoke

There are approximately 2,200 to 2,300 wood-burning devices in Libby. Table I presents the types of wood-burning devices in the Libby APCD in 1990. The table shows heating efficiency and total particulate emission rates.

COMMUNITY PROFILE

Libby is the Lincoln County seat and is located in the Kootenai Valley in northwestern Montana. Libby's climate, which is described as modified pacific maritime,¹ along with Libby's location in a deep mountain valley, result in poor dispersion of air pollutants.

Residents of Libby and the surrounding area rely heavily on wood heat.² To decrease residential woodsmoke's contribution to the air pollution in Libby, Libby residents must modify their heating habits. To better understand the heating changes that would best suit Libby, a review of Libby's socioeconomic situation was completed, including employment, level of income, housing, and recreational facilities. A summary of findings follows.

Socioeconomics

Employment. The Lincoln County and Libby economies are based on natural resources. The major industries in the Libby area are: 1) timber harvesting and processing; 2) federal and

local government (such as the U.S. Forest Service [USFS] and the local school district); 3) mining; and 4) other miscellaneous industries such as services and transportation.

On February 15, 1991, the major wood products employer in the area closed down its Libby plant for an indefinite period. Also, a vermiculite mine located near Libby closed during the summer of 1990. These layoffs brought the unemployment rate in Lincoln County up to about 20 percent.³

Employment in the area is highest during the months of April through November. Between December and March, however, seasonal layoffs occur, largely because of logging road closures due to the spring thaw, which causes the roads to become muddy. These conditions make the area's forests inaccessible to loggers and logging trucks.

Population. According to the 1990 census, Libby's current population is 2,532, 7.9 percent less than in 1980. Lincoln County officials estimate there are approximately 3,000 households in the APCD. The APCD population is higher as it includes some residences located outside the Libby city limits.

Income. Studies indicate that up to 20 percent of Lincoln County residents may be below the poverty level. This includes approximately 1,200 residents in the Libby area. Approximately 500 households in the Libby area received Low-Income Energy Assistance Program benefits during the 1990-91 heating season. That amounts to about 17 percent of the households in the APCD.

Housing. There are 5,357 housing units in the Libby area, including vacant, seasonal, and migratory units.¹ Nearly 25 percent of the housing units in Lincoln County are mobile homes, based on 1980 census data.⁴

The average monthly rent for a house in Libby is \$250 and the average apartment rent is \$225.¹ The average price of a 900-square-foot home with a basement or a 1,100-square-foot home without a basement is about \$45,000.

Recreation. Libby is located in an area with a variety of recreational opportunities. The Kootenai National Forest and the Cabinet Mountains Wilderness Area offer wildlife habitat for deer, elk, bear, moose, Rocky Mountain bighorn sheep, mountain goat, mountain lion, grouse, and assorted waterfowl.

Libby Dam, Lake Kootenai, and numerous other lakes and streams offer fishing, boating, swimming, snifing, and water skiing. The area surrounding Libby is also used extensively for hiking, backpacking, camping, horseback riding, snowmobiling, and cross-country and downhill skiing.

Energy Usage

The majority (about two-thirds) of Libby and surrounding area residents burn wood as their primary source of heat. A smaller percentage burn wood for supplementary heat. Many houses using wood heat also have some form of electric heat. In this case, electricity serves as a secondary heat source. Even though other heat sources may be available, it has been estimated that people who use wood heat in Libby burn wood almost 24 hours a day.

A Montana Department of Health and Environmental Sciences study estimated that 4,400 cords of wood were used in Libby in the 1988 and 1989 burning seasons. Many people collect wood from a pile of ends trimmed off of 2 x 4-inch boards (2 x 4 ends) located behind the local mill. Many senior citizens depend on this supply. However, the 2 x 4 ends are now only available to mill employees and their families. Another source of wood is the pile of trimmed log ends, known as lily pads, also located behind the mill. These lily pads were sold by the pickup truck load. These two wood sources are limited and may not be available to APCD residents in the future.

As noted above, electricity is often used as a secondary source of heat, as is propane, and in some instances, oil. Natural gas is not currently available in Libby.

Other Concerns

During the 1990-91 winter, the Sierra Legal Defense Fund, representing the National Wildlife Federation, initiated action which could affect the price of wood collecting permits in the Kootenai National Forest. In a letter to the editor of *The Western News*, a Libby newspaper, the National Wildlife Federation asked that "future decisions to sell firewood be accompanied by an environmental impact statement or environmental assessment." According to the letter, "such a study would undoubtedly consider whether Forest Service firewood permits are underpriced and are thus a subsidy that discourages investments in wood-burning technology that could improve energy efficiency while reducing air pollution."

The USFS regional forest administrator rejected efforts to require the USFS to restrict firewood gathering from the area's national forests.

Also, many Libby residents were reluctant to give up wood-burning completely because they consider it inexpensive and because collecting and burning wood has been a tradition in the Libby area for many years. Gathering wood is often a family activity or an event that takes place along with hunting and fishing. On the other hand, many people said they are tired of burning wood because it is dirty, requires a lot of work, and can cause respiratory problems. Also, many mentioned that if the cost of purchasing or gathering wood increases or if its availability decreases, wood may no longer be a viable heating option.

THE PLAN

The primary goal of this effort was to develop a workable woodsmoke reduction plan for the Libby APCD. During development of the plan, many community members were contacted for input. The increased level of community awareness and involvement, together with the specific strategies presented in the plan, will serve as a basis for achieving woodsmoke reduction during the 2-year voluntary compliance period.

Based on interviews and extensive research of existing programs, several options for reducing woodsmoke were developed. The final plan focussed on strategies deemed appropriate and workable for the community. The strategies are:

- Weatherization - thermal doors and double glass windows; weather stripping and caulking around doors, windows, etc.; insulation of walls, ceiling, and floors.
- Eliminate or decrease dependency on wood by using an alternative fuel - electricity, propane; oil; natural gas.
- Adopt new wood-burning habits - Burn fire logs; burn dry wood; burn a hot fire; stove maintenance program; type of wood used.
- Replace old stoves with new clean burning stoves - Certified cord woodstove; pellet stove.

As part of the plan, an integrated strategy for community support was developed to encourage participation in the suggested strategies.

STRATEGY FOR COMMUNITY SUPPORT AND ACCEPTANCE

In an effort to achieve a reduction in woodsmoke in the APCD, a community support and acceptance strategy was designed for the 2-year nonmandatory period. This strategy has been developed based on the EPA *Guidance Document for Residential Wood Combustion Emission Control Measures* (EPA-450/2-89-015), community input, and communication with other municipalities working to decrease residential woodsmoke pollution.

The objectives of Libby's community support and acceptance strategy are:

- Familiarize residents with the air quality control regulations
- Identify the residents' responsibilities under the regulations
- Justify the regulations
- Reinforce the issues and principles behind the regulations

- Promote better wood-burning practices and selection of alternative heating systems
- Encourage community involvement
- Communicate the potential health risk associated with woodstoves
- Reduce woodsmoke emissions

The EPA guidance document discusses three levels of effort that may be applied in implementing a community acceptance strategy. These are as follows:

- Minimal level-of-effort - Use of only one broadcast medium
- Medium level-of-effort - Use of a broadcast medium plus public comment
- High level-of-effort - Use of multimedia

For Libby's voluntary curtailment program, the high level-of-effort program was implemented, including the use of multimedia and extensive community involvement.

Community Involvement

Prior to the development of this plan, several steps had already been taken to involve and inform the public about the woodsmoke problem and the recent regulations. The first community involvement step was the 1988 formation of a Libby Air Quality Committee. The Montana Department of Health and Environmental Sciences met regularly with this group of local residents to assess Libby's overall air quality problem and design remedial actions. The existing air quality regulations were reviewed and approved by the Libby Air Quality Committee.

Next, state and local government representatives and the Libby Air Quality Committee established the APCD and distributed an air quality questionnaire to Libby residents in October 1988. The questionnaire asked for people's perceptions of the air quality issue, their heating habits, and their preferred remedies to the air pollution situation.

Discussions regarding the residential woodsmoke problem had appeared in the local newspapers. Also, local officials had spoken about air quality and woodsmoke on the radio and had spoken to various service groups.

In addition, a billboard indicating daily air quality had been placed on a main street in Libby. This sign is adjusted daily to indicate the quality of the air.

Other efforts have included community interviews for this plan and a mailing, from the Lincoln County Department of Environmental Health, to APCD residents that included a fact

sheet summarizing air quality and local residential woodsmoke regulations. Enclosed with the fact sheet was a county permit application for existing woodstoves and a sticker listing the air quality telephone hot line number.

Activities for Voluntary Compliance Period

Under the high level-of-effort program, individuals within each of the following categories are to take part in an extensive community acceptance and education effort. Libby's aggressive public education plan involves a broad base of community members, leaders, citizens, and business entities. An element of volunteer contribution appears throughout the plan.

Community Education. The following alternatives focus on educating the community as a whole about woodsmoke reduction.

Cable/Educational Channels - Several television stations in Libby are public and educational cable channels. These stations should be contacted to determine the requirements to broadcast woodsmoke reduction advertisements, public service announcements, and brief video clips. If the costs are reasonable, the station, local community college, or high school audiovisual group should be contacted to determine their interest in creating various woodsmoke-related television messages or programs.

Workshops/Neighborhood Meetings - County, community, and neighborhood leaders should organize workshops and meetings regarding woodsmoke reduction issues. Topics may cover a range of issues including health effects, woodstove financing, woodstove installation, and wood-burning habits. These meetings may occur in homes, schools, health facilities, community buildings, and service group buildings. Speakers influential in the community and familiar with the topic at hand should speak at these meetings. These workshops and meetings should be held monthly during the 2-year period and should be organized by county air quality personnel or interested community members. This topic is discussed in more detail below.

Newspapers - The three Libby area newspapers have carried stories regarding the woodsmoke problem, the Libby Air Quality Committee, and this plan. Woodsmoke reduction information should be provided to these papers as often as possible. Suggestions include additional coverage, public notice of meetings and opportunities for volunteerism, graphics demonstrating the air quality problem, and a monthly air quality/spotlight section.

This air quality/spotlight section could regularly contain information about Libby's air quality and the people affected by the regulations. Items may include interviews and interesting facts. The monthly spotlight could focus on a Libby APCD resident who has adapted to the woodsmoke regulations. It could provide a photograph of the individual and also summarize his or her methods of handling the situation. Occasional spotlights on area officials setting examples of woodsmoke reduction efforts are also suggested (see Government Programs/Leadership below).

Radio - Public service announcements (regarding wood-burning habits, volunteerism, etc.) and prepared air quality status announcements (such as, "The air is poor today, don't burn if you don't have a permitted stove and always use dry wood when you do burn") have been and should continue to be provided to the local radio station. Also, Libby residents familiar with the problem should be interviewed on the radio (such as local physicians and wood-burning appliance professionals).

The local community college speech class should be contacted regarding developing public service announcements and prepared air quality status reports.

Volunteerism - Libby residents and service groups should be encouraged to help the air quality effort through volunteerism. Volunteer activities may include speaking to groups; moisture testing wood; working with the logo contest (discussed below under school involvement), possibly as judges; and helping senior citizens obtain and store dry wood. Opportunities for volunteerism should be developed through the Libby Air Quality Committee or by individuals in charge of air quality for the county. These volunteer opportunities should be advertised on the radio, in the newspapers, and on flyers placed at various service organization headquarters. Students of all ages should be encouraged to volunteer, possibly for collecting wood for senior citizens or developing logos and public service announcements.

Billboards/Road Signs - In addition to the air quality status sign located on the main street, an air quality status sign should be placed at other heavily traveled areas.

Along with the additional air quality status signs, woodsmoke reduction billboards should be placed throughout the town. These signs would display the air quality logo developed by local school children (see school involvement below), and would also display brief facts about woodsmoke, and slogans such as "Help Make it Clear, Volunteer" or "Help Clear the Air, Do Your Share."

Events/Fairs - Events and fairs should be developed based on woodsmoke reduction or this theme should be included in planned events. A display area should be provided where individuals can ask questions about wood, woodstoves, proper burning, and stove installation. The displays should be staffed by county air quality officials and volunteers. Wood moisture testing should be provided in the display area as should brochures on health effects, proper wood-burning, and other wood-burning issues.

Wood-burning themes could vary depending on the season. If it is a spring or summer gathering, the theme should revolve around collecting wood early, keeping it dry, and buying new woodstoves. If it is a fall or winter event, the emphasis could be on proper burning methods and health effects.

Fact Sheets - Fact sheets regarding wood burning should be developed by local government or obtained from other sources. Topics which should be included, but need not be developed specifically for Libby, are proper burning methods, health effects, efficient

woodstoves, and other sources of heating energy. Local fact sheets should be developed discussing issues of concern specific to Libby, such as the local regulations, local health trends, and local reduction programs and efforts.

Public Speakers - As mentioned above, the local government should organize public speakers to address issues of concern and help individuals with specific woodstove financing concerns. Workshops where financial experts and individuals from the various credit unions or banks are available may be especially helpful to those with low incomes. Other public speakers should include health and wood appliance professionals.

School Involvement. Children should be educated on the woodsmoke problem, health effects, and proper wood-burning habits. They should be made aware that woodsmoke is a major community concern.

Logo Contest - A local middle school art class should, as a class project, take part in a contest for developing a Libby air quality logo. The contest could be run by the county or a volunteer, although the school's art teacher would coordinate the art work and related components. The county should provide the students with some basic wood-burning information on which to base their art work. This information should be selected by the county and the art instructor.

The county could provide an award for the winning design. Volunteers and interested parties should serve as judges and the award should be given to the winner at a publicized ceremony.

The selected logo would then serve as the symbol for Libby's woodsmoke reduction effort. The logo would appear on billboards, fact sheets, newspaper announcements, displays, and possibly t-shirts.

Curriculum - The Libby school superintendent indicated there was interest among the teachers in incorporating information concerning woodstove smoke, health effects, weather inversions, and other air pollution-related topics in science class curriculum. A sample curriculum from the Oregon Department of Environmental Quality that outlines science projects and other issues of interest has been provided to the school district.

Business/Employee Involvement. Business/employee involvement could include a large number of people in the community. Encouraging businesses to distribute information to their employees and customers is an effective technique for community education.

Lumber Mill Fitness Center - The staff at the lumber mill fitness center, which is scheduled to remain open during the plant shutdown, is very interested in providing information and meeting facilities for the woodsmoke reduction effort.

Employment Packages - Information on the woodsmoke problem in Libby, proper wood burning, health effects, and the air quality regulations could be provided in new employee packages. The county should provide brochures regarding the woodsmoke reduction effort to major employers in the area for inclusion in the new employee packets.

Statement Mailings - Libby banks, credit unions, and power companies agreed to include woodsmoke reduction information provided by the county in their monthly statement mailings. The county should ensure that this method of distribution is implemented.

Small Business Development - Wood pellets are produced and distributed in Libby. Fire logs are produced nearby. Information regarding these fuel sources should be made available to the community and representatives of these companies could be asked to attend local meetings and provide information on their fuel products.

A storage shed is an item that may be required to ensure that wood remains dry. Other towns with woodsmoke problems have provided brochures describing how to make a storage shed quickly and easily. Public meetings, and radio, television, and newspaper interviews should discuss the economic benefits of designing and distributing premade storage sheds at a reasonable price.

Another opportunity for business development is woodstove installation. Due to the new air quality regulations and recommendation of this plan, many people may choose to buy new stoves and woodstove installations may greatly increase in number. A current woodstove installer in Libby has indicated that he would be willing to train individuals in proper woodstove installation. In addition, a national installation certification test is periodically offered in conjunction with the Wood Heating Alliance. This test is generally given at local community colleges and a minimum of five test takers is required. Local government should consider working with the local community college and Libby Job Service to provide training and certification to individuals interested in woodstove installation.

Government Programs/Leadership.

Air Quality Position - A full-time air quality specialist should be hired to assist the county in implementing the air quality program. This person would serve as a regulator, enforcer, and educator and would be responsible for implementing and maintaining the local air quality program.

This person could also serve as a liaison between neighborhood groups, schools, public speakers, volunteers, the media, and local businesses. The specialist should be educated (preferably with a science degree, yet with a strong interest in sociology or psychology), with 2 to 3 years experience in local public administration programs (preferably not limited to the Libby area).

Information Bank - All information obtained from sources around the country and in Montana, including brochures, local publications, briefings from public talks, and workshop products should be stored in Libby's Air Quality Information Bank. This bank will serve as an information source for any individuals, either in the Libby area or elsewhere across the nation, seeking woodsmoke reduction assistance. This information bank should be maintained by county clerical staff under the direction of the air quality specialist.

Phone Advisory Calls - The air quality specialist may make a certain number of advisory phone calls (perhaps four) every week to provide information on wood burning and obtain feedback from the community. These phone calls could be to private homes, businesses, service groups, or schools. Through the phone calls, the specialist may provide brief bits of information regarding woodsmoke reduction.

Also, if possible, it might be helpful to have groups of people (perhaps service groups or volunteers under the supervision of the air quality specialist) make phone calls to the APCD residents in a phone-a-thon format to provide information about financial options available (for additional funding details see accompanying paper, *An Integrated Community Approach to Reducing Residential Woodsmoke: Innovative Funding of Control Strategies* by Laurie Manderline and Randy Fox, in this *Transactions*) or to review proper wood-burning habits.

Events - As noted above under Community Education, local government and the county air quality specialist should schedule special events either separately or as part of seasonal events that could include woodstove fairs, public speakers, and an air quality exhibit booth. These activities should occur year round to encourage people to gather wood early, let it dry, and consider the health effects of woodsmoke.

Hotline - A ventilation hotline has already been established which residents may call to hear a report on the day's air quality. The county has also distributed stickers with the hotline number to all APCD residents. This service should continue.

It may prove helpful to provide educational information as well as air quality information on the hotline. For example, the message could say "Libby's air quality today is poor. So tomorrow's air will be better, please remember to always burn dry wood," or "Libby's air quality today is good. Help keep the air clean by volunteering to gather wood early for our senior citizens."

Examples Set by Officials and County Employees - In an effort to ensure that Libby residents cooperate with woodsmoke reduction measures, local officials and county employees should personally comply with the air quality regulations. Those who have changed their habits, energy source, or woodstove should encourage their neighbors and friends to comply with the regulations while the voluntary restrictions apply.

Moisture Meters - A moisture metering station has been established at the county offices. This station should be advertised on the hotline, in newspapers, on television, in mailings, and

on the radio. A moisture metering station should also be made available at local events. These stations should be staffed by the air quality specialist and volunteers. If the moisture meter station is not used, it should be moved to a different location with more traffic.

Health/Medical Involvement.

Health Brochures in Medical Offices - An informational brochure has been distributed to all APCD residents. This brochure contained some health effects information. However, the county health official, the local respiratory therapist, and other interested parties should be encouraged to produce a brochure strictly on the health effects of woodsmoke. These should be printed and distributed by the county to all APCD residents.

This brochure should also be placed in all medical offices in the Libby area, and other locations such as schools and the Lincoln County Library. Additional health brochures produced by EPA, the state of Montana, or possibly the National Institute of Health, should be obtained and placed in medical offices throughout the Libby area.

Health Symposium - Public speakers and workshops have been discussed at length in this plan. A health symposium or possibly health fair directed towards woodsmoke and its health effects should be scheduled on a yearly basis. The health symposium or fair could consist of respiratory tests, informational lectures and videos, and wood moisture testing. In fact, the health symposium could be tied into an area-wide better health effort. This may help area residents understand how breathing woodsmoke may relate to other syndromes and diseases. This symposium or fair should be organized by the local medical community with the help of the county air quality specialist.

TIMETABLE

Although all of the community education and involvement efforts discussed in this plan should take place throughout the 2-year voluntary compliance period, several activities should be implemented as early as possible (Figure 1). The informational brochure and hotline are two activities that have already been developed and implemented. Additional up front activities that would be effective include development and dissemination of a woodsmoke reduction logo, educational and informative billboards and road signs, statement mailings, health brochures, officials and county employees setting examples, and possibly phone advisory calls. It may also be effective to begin a regular air quality section in the local newspapers.

These efforts should be performed early in the compliance period to inform, encourage, and educate the residents. Additional activities over the 2-year period and potentially into the future will be important to keep awareness high. Workshops, held by local professionals, should provide information on weatherization, fuel conversion, new wood stoves, and available financing. Initially, a strong effort should be made to show the residents that the county is determined to achieve the air quality goals.

CONCLUSION

Libby, Montana offered a unique setting to develop a comprehensive plan for reducing woodsmoke. While a clear understanding of the relationship between air pollution and woodsmoke is important, appropriate strategies and community support are needed to effectively decrease residential woodsmoke emissions. A program designed to successfully reduce woodsmoke must provide residents with technical alternatives, funding options, and educational opportunities. This way the residents will be able to choose the appropriate combination of strategies and community activities to meet the needs of the individual and community.

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Table I. Wood heating devices in Libby.

Type of Wood Burning Device	Number in Libby ^a	Heating Efficiency ^b	Average Particulate Emissions (g/hr) ^b
Fireplaces	Very few in use	0 - 15%	40 to 60
Fireplace inserts	300	Up to 50 or 60%	5 to 50
Noncertified wood burning stoves	1,500	Up to 50%	Up to 50
EPA-certified wood burning stoves	125	50 to 80%	1 to 6
Pellet stoves	150	60 to 85%	1 to 2
Wood furnaces	100	Up to 85%	Varies greatly
Other miscellaneous wood-burning devices	Fewer than 50	Varies greatly	Varies greatly
Total Estimated Wood-burning Devices	2,200 to 2,300		

Source:

^aInterviews with Libby wood heating professionals

^bWood Heat, Montana Department of Natural Resources and Conservation, March 1985.

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	1991			1992		
	June	September	December	March	June	September
COMMUNITY EDUCATION ACTIVITIES						
Community implements primary education efforts such as developing a logo, erecting road signs, and distributing statement mailings about health effects and wood burning issues	[Timeline bar from June 1991 to September 1992]					
Community educates community leaders and they begin to set examples	[Timeline bar from June 1991 to September 1992]					
Local professionals hold educational workshops on weatherization, conversion, proper wood burning, new wood stoves, and financing options	[Timeline bar from June 1991 to September 1992]					
County disseminates information to the public through newspaper articles, television, radio, brochures, meetings, and employee packages. Volunteerism is encouraged	[Timeline bar from June 1991 to September 1992]					
County provides information at community events and fairs	X	X			X	X
Schools add wood smoke reduction curriculum and hold educational sessions	[Timeline bar from June 1991 to September 1992]					
FUNDING ACTIVITIES						
Financial institutions make Clean Air Loans available	[Timeline bar from June 1991 to September 1992]					
County initiates activities to set up a Clean Air Fund through a non-profit organization	[Timeline bar from June 1991 to September 1992]					
Clean Air Fund is established and seeks donations	[Timeline bar from June 1991 to September 1992]					
County or city of Libby applies for Community Development Block Grant			X			

● OCTOBER 1992 - REGULATORY DEADLINE FOR ACHIEVING 80 PERCENT PM10 REDUCTION GOAL

Figure 1. Libby woodsmoke reduction plan timetable for implementation.

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	1991			1992		
	June	September	December	March	June	September
WOOD SMOKE REDUCTION ACTIVITIES						
A. Weatherization						
Lincoln County conducts home weatherization audits	[Timeline bar from June 1991 to September 1992]					
Retailers offer sales incentives for weatherization materials	[Timeline bar from June 1991 to September 1992]					
Homeowner weatherizes home	[Timeline bar from June 1991 to September 1992]					
B. Using Alternative Fuels						
Retailers offer sales incentives for electric, propane, and oil heating devices	[Timeline bar from June 1991 to September 1992]					
Homeowners convert to alternative fuels	[Timeline bar from June 1991 to September 1992]					
C. Adopt Good Wood Burning Habits						
Retailers promote sales of fire logs	[Timeline bar from June 1991 to September 1992]					
Community develops distribution and bulk sales network for fire logs	[Timeline bar from June 1991 to September 1992]					
Homeowner cuts wood early and allows to dry out	X					
Community promotes and sells low-cost wood sheds to homeowners	[Timeline bar from June 1991 to September 1992]					
Homeowner practices good wood burning habits	[Timeline bar from June 1991 to September 1992]					
Homeowner regularly maintains stove and cleans chimney	[Timeline bar from June 1991 to September 1992]					
D. Replace Old Wood Stoves with New Stoves						
County and retailers coordinate new wood stove sales program	[Timeline bar from June 1991 to September 1992]					
Homeowners purchase new stoves that are professionally sized and installed	[Timeline bar from June 1991 to September 1992]					

● OCTOBER 1992 - REGULATORY DEADLINE FOR ACHIEVING 80 PERCENT PM10 REDUCTION GOAL

Figure 1 (continued). Libby woodsmoke reduction plan timetable for implementation.