

Environmental Quality Board  
Rachel Carson State Office Building, 16th Floor  
400 Market Street  
Harrisburg, PA 17101-2301

Summary page

Environmental Quality Board:

I am writing to make known that I definitely see a need for this proposed rulemaking becoming law. DEP needs to step up and protect the environment, with the NESCAUM report there is ample information to follow through with this rule. DEP should follow the NESCAUM recommendation of 5 feet above the roof line for the chimney height and not 2 feet as proposed by Pa DEP rulemaking. Also there should be no burning in the summer. Let people enjoy their backyards. My whole family has had adverse reactions, illnesses from wood smoke, please help.

The statement that only a few people are complaining about wood smoke, but there are reasons. Some people don't understand the negative health effects of wood smoke. Others worry about losing property value if it is public knowledge that people will become ill if they would purchase the property. Even retaliation from the offender, as they will increase the smoke coming from that property.

Some advice is to just close your windows and stay indoors. This sounds at first to be a reasonable way to mitigate the health affects of the wood smoke. But all houses have negative air pressure, warm air leaks out of small cracks at window, doors, wall receptacles, etc... A recent study shows that wood smoke pollution indoors can be almost as high as the pollution levels outdoors, even in homes that do not burn wood. #1 In fact the minimum recommended air exchanges for good health is .35 air exchanges per hour and not less than 15 cubic feet per minute per person. #2 To put a number to this a 2000 square foot home with 8 foot ceilings require 5600 cubic feet of outside air minimally. And remember this is every hour, for 24 hours 134,400 cubic feet of air exchange. And if the house is not new construction it will have air exchanges 3 to 6 times this amount. Wood and wood ash are known to be sources that bring mold and fungus into the home. Combustion does not kill mold spores, it spreads them.#3 This causes property damage and lung problems. Wood smoke particles are submicroscopic; this allows them to get past the lungs natural defenses. The particles get deep into the lung and stay there. Some will even go straight into the blood stream as they will pass right through the lungs into the blood vessels.#4 There are many chemicals released in wood smoke including arsenic, lead, CO etc.

David and Joyce Backes

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#1 <http://www.ecy.wa.gov/pubs/91br023.pdf>

#2 These standards are set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).

#3 "Interstitial Lung Disease and Domestic Wood Burning": Ramage, Roggli, bell and Piantadosi, AM REV RESPIR DIS 1988; 137:1229-1232

#4 Prof. P.K. Hopke, Dept. of Chemistry, Clarkson University, Potsdam, NY "Measurement of the Hygroscopicity of the Indoor Aerosol". Aug. 1996, Center for Indoor Air Research.

Comments on proposed rulemaking (25PA. Code CHS 121 and 123) Outdoor Wood-Fired Boilers (39 Pa.B. 6068) (Saturday, October 17, 2009)

Return name: David L. Flick, 132 Rich Road, Somerset, PA 15501 (814) 445-3061

Email: [dsfsanyo@pennswoods.net](mailto:dsfsanyo@pennswoods.net)

This proposal should be revised to serve the best interests of the residents of Pennsylvania. Elected representatives do not reach state government through a unanimous vote, but, nonetheless, have a moral obligation to serve the best interests of all the people. I believe regulation of OWBs should have been by local governments after evaluation of problems on a case by case. This is especially true of existing units.

Portions of this proposal will have a major negative financial impact on many current OWB owners. Specifically, the requirement to have the stack height extend at least 2 feet above the peak of the highest residence located within 500 feet of the OWB. In many cases this requirement will vary from extremely expensive to nearly impossible. It accomplishes nothing where units are already installed in prevailing downwind air currents without complaints from neighbors. This height requirement does not exclude the residence of the OWB owner. An increased stack height might be needed where there are well established grounds for nuisance complaints by neighbors, but should not be a hardship rubber-stamped on the very large percentage of owners, who using common sense with concern for their neighbors installed their OWBs downwind. This regulation should not apply to outside propane burners as it is a very clean fuel.

The stack height requirement will not lessen total PM. In fact it is likely to cause increased resistance to airflow, inefficient combustion, and more total pollutants. The high stack height combined with the requirement for permanent attachment of the stack will make many flues nearly impossible to clean resulting in greater risk of fires and increased pollution. There are risks that fires in tower high stacks may cause them to topple over igniting nearby homes. There are all major risks of falls from elevated heights as owners attempt to erect very high stacks.

Existing OWB owners installed these units in good faith in compliance with regulations at the time of installation. Passing a regulation which will require many preexisting units to be removed from service will cause an extreme financial hardship on the owners. Some have in excess of \$10,000 invested. I have about \$16,000 in my OWB installation and it saves me about \$2,500 annually. There have been no complaints regarding my furnace. This is like passing a new residential building code and requiring all existing homeowners to tear down their residences and rebuild to the new standard. Many of the poorest rural families have installed these units to help them survive our harsh winters and avoid financial collapse. All existing owners who can not meet the new standard should be reimbursed for their loss. Now many will be forced to buy oil pumped from the soil of countries run by dictators. I thought these furnaces helped lower our dependence on such foreign sources. If this regulation does not permit burning of coal, then it will result in the removal of thousands of additional trees from our ecosystem and may cause job losses in the mining industry.

Much of this proposal is unreasonable. I respectfully ask that you reconsider.

1010

RECEIVED

DEC 18 2009

J. Dennis and Kathy S. Grube  
7506 Mason Dixon Highway  
Meyersdale, PA 15552  
814-634-5118  
December 12, 2009  
Re: Proposed OWB regulations

ENVIRONMENTAL QUALITY BOARD

Environmental Quality Board  
P. O. Box 8477,  
Harrisburg, PA 17105-8477

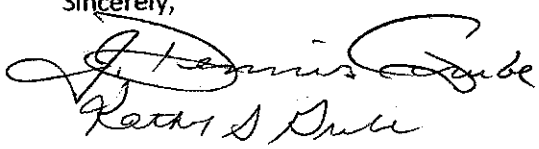
Dear Environmental Quality Board,

Please allow us the opportunity to abbreviate the accompanying three page letter of experience and findings with respect to our outdoor multifuel boiler. Our boiler was manufactured in Pennsylvania with grates to burn wood and coal. We have heated our house for over 25 years with these two products, some acquired from downed trees in our 10 acre woodlot and some purchased from hardworking miners and loggers in PA. To declare this outside boiler illegal (it doesn't fit proposed setback and stack height limits) will result in our having to move our solid fuel heat back indoors, resulting in more dirt in the house, more emissions closer to our one neighbor, and less safety for our family. Blanket rulemaking, as proposed, cannot work in our widely diverse countryside. Let us make the following brief points, expanded upon in our enclosed letter.

- 1) PA residents are still at work to manufacture and provide fuel for our boiler; no overseas oil heat needed.
- 2) No matter what approval, UL or other, outdoor heaters are SAFER than any indoor wood and coal fired appliances. Our insurance agent and local fire departments concur.
- 3) Setbacks and chimney heights are exorbitant and discriminatory. Many folks burn wood and coal from inside their homes with no setback limits and chimney height restrictions. Our house chimney is only 20' from our neighbor's house...our outdoor boiler is over 90' away and downwind. Another upwind neighbor is 400' away, upwind, and uphill...We would need in excess of a 50' chimney to comply, while moving the heat back indoors would use the existing 18' tall chimney.
- 4) Smoke is more of a function of wind direction, barometric pressure, and thermal inversions. During colder months all of the above minimize smoking; we only ever had one complaint from our nearest neighbor when the boiler was used during the summer for domestic hot water. We quit using it from May through September and have had no complaints.
- 5) Energy use and efficiency is never forgotten when WE are responsible to supply our own heat. A twelve month gas budget does not call energy savings to mind more than putting wood or coal on our fire everyday. Self sufficiency is to be commended in this age of entitlements; we would challenge the EQB to find anyone using an outdoor boiler who accepts any taxpayer funded energy assistance. Please be thankful for saved energy dollars which can be spent on other PA. products in these dire economic times.
- 6) Our current outdoor boiler provides heat for a small machine shop in addition to our home; we provide the winter heat included in the monthly rental. If this small business owner is forced to install his own oil heat, he has said he will close up shop; He won't be able to afford the heat. Job loss will include one fulltime and one part-time worker. We are always searching for more efficiency; when new more efficient solid fuel boilers become available, we will update as we have with vehicles that have aged.

Thank you for your consideration. Please read the full details of our view and experience thoroughly. We believe that requiring a new efficiency standard moving forward is appropriate. We also believe that any property setbacks and chimney restrictions should be handled on a local permitting basis. Winter in our hills cannot be imagined from either end of this wildly varied state. Please reconsider this proposal, so harmful to many PA residents.

Sincerely,



J. Dennis and Kathy S. Grube

My next door neighbor installed an OWB approximately 30 feet from my house in October 2005. Since that time my family has had to deal with high levels of smoke pollution on my property. The unit is generally operated from the end of October until the middle of April. To mitigate the wood smoke that seeps in, I have taken a number of steps to make my house more air-tight. The ground-level windows in my basement have to be covered with plastic and taped. I have added weather stripping and caulking material to every window and door to make them as tight as possible. I found that a negative draft created in the exhaust flue of the gas water heater was drawing dirty air into my basement. To counteract this I have mounted a fan on the outside of the flue to prevent the draft from forming. We have bought air cleaners for every floor of the house. I have used spray insulation to seal the interior basement walls where they meet the exterior sheathing, as I found some of the seams were drafty and allowed bad air in. My house was built in 1999 and I didn't consider it drafty prior to the OWB installation.

Despite my efforts the smoky odor persists as it is impossible to make a stick-frame house 100% airtight. I have an infant child and I am concerned about the effects on her health. As for me and my wife, we cannot enjoy the use of our own yard, as very often our clothing reeks of smoke after spending any amount of time outdoors. In 2007 I suffered an asthma-like attack brought on, almost certainly, from inhaling smoke particles while I was doing a chore in my yard. I went to the ER and needed an inhaler for weeks afterward.

In 2006 my borough passed an ordinance banning future OWB's, but grandfathered existing units and added a stack requirement. In my case the stack height was set at 20 feet. This does little to mitigate the effects of the smoke, since the same amount of material is ejected, just at a higher elevation. The proposed rulemaking will be effective in preventing new OWB's from being installed in locations where they will be likely to affect neighbors, but people like me who live next to existing units aren't being adequately protected. My neighbor's stack is guyed to the OWB enclosure itself. Adding another 10-15 feet will result in a structure that has the potential to fall into my house if it collapses. My neighbor's first 20-foot stack collapsed, fortunately without landing on my property. It is obvious that the Board recognizes the danger of the particulate emissions that OWBs emit. I ask that the Board consider extending the setback requirement to all OWB installations, whether current or future units. Barring that, I would ask that the DEP be given the power to examine existing OWB installations on a case-by-case basis and determine if continued operation poses a public health risk.

One argument that OWB proponents make is that they mitigate the high cost of conventional fuel sources like natural gas, propane, and electricity. My neighbor told me that his unit was \$7000 plus an additional \$1000 in installation costs. He also has to purchase the wood that is burnt, which greatly extends the time it takes for the OWB to pay for itself. I urge the board to reconsider the affordability argument in light of the high cost of these units. I have seen advertisements for these units that offer financing to prospective owners, which would yet again extend the payback period when taking finance charges into account. If one can afford to purchase or finance a wood boiler then the financial wherewithal exists to invest in a cleaner heating source.

Matthew Kiner Lewisberry, PA

CHARLES MCPHEDRAN  
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**Summary of Comments by Citizens for Pennsylvania's Future (PennFuture),  
Clean Air Council, PennEnvironment, Sierra Club--Pennsylvania Chapter, and  
American Lung Association in Pennsylvania  
on Outdoor Wood-Fired Boiler Proposed Rule**

Our groups support regulation of outdoor wood-fired boilers (OWBs) by the Department of Environmental Protection (Department). Pollution from OWBs poses significant risks due to high emissions of fine particles and other pollutants. A single OWB can cause fine particle levels exceeding national health standards at a distance of 50 to 150 feet. Fine particles are associated with heart disease, lung disease, and premature death. Part of all of twenty-two Pennsylvania counties already do not meet national health standards for fine particles.

OWBs also cause nuisance (quality of life) effects for neighbors. Across the state, neighbors find they cannot remain in their yards because of smoke and fumes, and even sometimes have watery eyes, sore throats, and burning lungs inside their homes. These neighbors of OWBs need immediate relief.

County and municipal governments are on the front lines of the OWB problem, and we hope they will play a strong role in responding to nuisance air pollution from OWBs. However, few have ordinances targeted at OWBs, enforcement is uneven, and the Department has special expertise in air pollution matters. We urge the Environmental Quality Board (Board) to adopt a statewide rule for enforcement by the Department. This rule should also preserve existing legal remedies for neighbors.

There is ample precedent for Pennsylvania to take action. Other states have responded to OWB pollution with regulations containing similar elements to those proposed here, including setbacks, stack heights, fuel restrictions, prohibitions on the sale of pre-Phase 2 boilers, and notices to OWB purchasers.

An effective rule in Pennsylvania must include a combination of these items, plus several additional elements. Neighbors want to be outside in their yards and have windows open in their homes during the summer, when heating needs from OWBs are also reduced. Therefore, we support the seasonal prohibition on OWB operation between May 1 and September 30. Also, we need an effective way to reduce emissions from older, dirtier OWBs already operating in Pennsylvania. A buyback program could help remove some of these units. Finally, the Department must respond effectively to citizen complaints regarding OWBs, including by enforcement action when appropriate.

We urge the Board to take aggressive action that will protect the public health and prevent nuisances.

EQB SUMMARY WOOD FIRED BOILERS

The Sierra Club, Pennsylvania Chapter supports the regulation controlling emissions from new outdoor wood fired boilers in Pennsylvania that is proposed in 39 Pa. B.6068, with additions; 40,000 uncontrolled OWBs are predicted in PA by 2010, with obvious implications for continued or even increases in PM nonattainment in Pennsylvania;

Many Complaints include smoke, odors, the burning of prohibited fuels, garbage, tires, electronics and hazardous waste such as foam and other plastics; a cyclic operating process creating an on/off burn cycle plus incomplete combustion of the wood fuel can release carcinogenic benzene, formaldehyde, dioxin, and polycyclic aromatic hydrocarbons in addition to PM 2.5;

uncontrolled OWB PM2.5 emissions are equivalent to 205 oil burning furnaces and 8000 natural gas furnaces. The smallest OWB on the market has the potential to emit one and one half tons of PM2.5 each year;

state regulatory action involving OWBs would ensure increased protection of human health from PM 2.5, smoke and toxic pollutant exposures, mediate acute episodes of locally drastically reduced visibility, reduce the pollution load, alleviate the need for a patchwork of local municipal controls across Pennsylvania, alleviate the local cost of developing and enforcing municipal ordinances, and reduce the certainty that some PA counties will trigger new PM 2.5 nonattainment in the near future, due to uncontrolled or under-controlled OWB emissions.

The Sierra Club suggests that Pennsylvania's regulation should include provisions to phase-in controls on existing units, provide seasonal protection from OWB emissions by prohibiting units from being used between April 1 - October 31 in Pennsylvania PM 2.5 nonattainment areas and in any population center that is a village, town, borough or city;

the regulation should prohibit OWB owner/operators along the state boundaries from burning within 500 feet of the boundary line of a residence, nursing home, hospital, day care center or school in another state;

In Pennsylvania, do the same; protect those residing in nursing homes and hospitals, and those attending schools and day care centers;

PADEP should fund an education program for existing OWB owner/operators to explain the hazards of uncontrolled emissions, and the benefits of controlling OWB emissions;

spell out within the definition of clean wood that there is no contamination allowed by any toxin listed by the federal government within the Clean Air Act, Clean Water Act, RCRA or Superfund, or any other applicable federal or Pennsylvania state law, such as the PA Air Pollution Control Act;

In conclusion, PADEP's analyses of costs associated with compliance show a very reasonable and affordable solution to the growing OWB problem.

[1] NESCAUM. Northeast States for Coordinated Land Use Management. 2009. *Outdoor Wood Boiler Fact Sheet*.

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Nancy F. Parks  
Chair, Clean Air Committee, Chapter At-Large delegate,  
Council of Club Leaders Delegate, Bernheim Committee  
Chapter Reserve Funds Committee

1878

**Tate, Michele**

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**From:** Kevin Stewart [kstewart@lunginfo.org]

**Sent:** Friday, February 12, 2010 4:17 PM

**To:** EP, RegComments

**Subject:** One-page Summary of Comments of ALAPA to EQB on OWB Proposed Rulemaking

Please review the attached one-page Summary of Comments.

**Kevin M. Stewart**

Director of Environmental Health

American Lung Association

*Serving the communities of Delaware, New Jersey, Pennsylvania and West Virginia*

*"Fighting for Air"*

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**American Lung Association in Pennsylvania**  
**Summary of Comments before the Environmental Quality Board Regarding Provisions for the**  
**Control of Emissions from the Operation of Outdoor Wood-Fired Boilers**  
**February 12, 2010**

The American Lung Association in Pennsylvania (ALAPA) strongly supports the proposed rulemaking and respectfully advocates that the Board adopt the regulation proposed by the Department.

The American Lung Association regards with great concern the burgeoning use of outdoor wood-fired boilers (OWBs) and finds, supported by the literature and by accounts of affected persons, that

- these units produce emissions that are either poorly controlled or essentially uncontrolled;
- the production of emissions occurs at a rate that far exceeds those from other common major household sources, usually by an order of magnitude or two;
- the kinds of emissions from such units are among those that are most hazardous to health, and include acid gases, fine particle pollution, air toxics and carcinogens;
- the use of such units produces air pollution that is causally associated with days of increased symptoms and restricted activity, increased absenteeism, increased medication use and physician visits, asthma attacks, hospital admissions, emergency department visits, and premature death.
- the use of such units frequently results in loss of enjoyment of life and property for exposed persons;
- the siting, design, installation, operation, and fuels of such units each contribute to create locally high levels of air pollution, both for the users themselves and for nearby residents
- the more that OWBs are permitted to proliferate unchecked, the more we can expect to see increased air pollution levels, not only for affected localities, but also for the region as a whole.

In short, the Department cannot afford *not* to institute responsible regulations to control the emissions from OWBs. The only issues remaining are what regulations would be both effective and fair.

- The proposed rulemaking before the Board is substantially in keeping with language proposed by the NESCAUM in its *Model Regulation for Outdoor Hydronic Heaters*, and of the same tenor as – and in some respects, weaker than – that being considered by or already adopted by several other states.
- Municipalities have simply not adequately controlled this source of air pollution, and do not appear likely to do so. In a survey conducted over the past year of 831 municipalities in 22 randomly selected counties in Pennsylvania, fewer than 10% (only 70 municipalities) could be affirmatively identified as having in place an ordinance *of any kind* governing outdoor wood-fired boilers.
- ALAPA supports the Department's requirement that new OWBs meet the United States EPA's Phase 2 emissions standard of 0.32 pound PM per million Btu heat output. ALAPA would also support an orderly phase-in to help owners of older equipment transition to less polluting alternatives.
- ALAPA supports the Department's suggested seasonal restriction on OWB use between the dates of May 1 and September 30.
- ALAPA strongly supports an effective rule governing stack height.
- As for any concerns about issues such as the workability of the rule in steep topography, or its applicability to siting in non-residential areas, or its potential for adverse effects on the economic security of some individuals, ALAPA would support focused steps to deal with specific concerns, and the establishment of programs as may be necessary to assist disadvantaged or indigent populations to deal with economic hardship that adoption of this regulation may pose. However, under no circumstances would ALAPA accept that the need to deal with these difficulties would justify the abandonment of strong controls of OWBs and their emissions.

One person's privilege to engage in legal activity does not give that person the right to affect adversely the health of another. In other words, one person's choice to employ an OWB does not give that person a right to pollute a neighbor's air. Simply, a person's right to clean air, as guaranteed by Pennsylvania's Constitution, must be upheld.



# HAWKEN ENERGY



December 15, 2009

RECEIVED

Environmental Quality Board  
PO Box 8477  
Harrisburg, PA 17105-8477

DEC 18 2009

ENVIRONMENTAL QUALITY BOARD

Re: COVER LETTER SUMMARY ONLY

Dear Board:

The following one-page summary only comments are being provided in response to Proposed Rulemaking on Outdoor Wood-Fired Boilers dated Saturday, October 17, 2009. In summary, we strongly urge the board to NOT adopt the proposed rulemaking for the following reasons:

1. The Proposal was prepared using grossly flawed data.
2. The Proposal will severely damage the economy of the Commonwealth of Pennsylvania by killing jobs, and by increasing heating costs for many businesses and homeowners by over 400 percent.
3. The Proposal will expose the board and the Commonwealth to a potentially enormous legal liability associated with deaths and injuries resulting from carbon monoxide poisoning and house fires.
4. The Proposal will dramatically increase the emissions of greenhouse gasses.
5. The Commonwealth consists of largely rural areas where outdoor wood-fired boilers (OWBs) do not impact anyone. Broad regulation of OWBs throughout the entire Commonwealth would be overly burdensome to citizens in most areas of the Commonwealth. Therefore, any necessary regulation should be established at the local municipal level in densely populated areas only.

Please see my detailed letter for further data.

Sincerely,

Warren W. Walborn  
President & CEO

**www.HawkenEnergy.com**

1064 Industrial Park Drive • P.O. Box 351 • Shelby, MI 49455  
Toll Free: (888) Log-Burn • Local: (231) 861-8200 • Fax: (231) 861-0111

**Summary of Comments for Proposed Rule Making 25 Pa. Code Chapters 121 and 123 for Outdoor Wood-Fired Boilers**

- 1) There is a dichotomy between the actual legal foundation for this proposed regulation and the proposed regulation. The APCA limits the Department's authority to regulate household heating sources. Specifically, Section 6.1 of the APCA, 35 P.S. 4006.1, states that no written approval (plan approval or permit) shall be necessary for any such source, equipment or device used solely for the supplying of heat or hot water to one structure intended as a one-family or two-family dwelling. **Yet, the proposed rulemaking sites this same act, specifically section 5(a)(1) of the APCA (35 P.S. 4005(a)(1) for its legal foundation and statutory authority.**
- 2) Further legal precedent can be found in ACT 537 enacted in 1966, which basically provides forty-five years of precedent indicating the need to keep the Department out of people's back yards and allowing local governments to oversee proper planning of issues such as this that cannot be efficiently governed by a blanket six page proposed rule. DEP should regulate industry not individuals.
- 3) The Department's proposed regulation leaves no out for some OWB owners. Some families will have to increase their stack height up to eighty-five feet (which is not structural feasible or within local ordinances). The regulation will force OWB to abandon their OWB at a cost of nearly \$15,000.00 and then spend an additional \$10,000.00 for a new heating unit.
- 4) Stack tests in the NESCAUM report do not meet PA standards. PA DEP requires that stack test meet an isokinetic rate between 90% and 110%. Meaning, stack test Nos. 1, 3, 5, 6, 8, 9, and 10 do not qualify as representative data. Tests runs performed during the idle burn are invalid due to erroneous flow measurement rates. **Only five out of seventeen test runs would provide appropriate data and that's only after a cursory review. Meaning 71% of the stack test data is not valid and the five tests that might be valid yielded the five lowest emission rates!**
- 5) The NESCAUM report doesn't indicate the exact location of the unit in question (if the picture on the front cover is any indication the unit is located on a valley floor (railroad tracks in the background)), the height of the stack (very short height) and the OWB smoked continuously all day. In other words, that is the worst case scenario. The Department can't justly compare these results to my OWB or any other OWB. My OWB has a stack height of thirty-four feet, completely shuts down in idle mode (doesn't smoke when not being called on for heat) and my OWB disperses its effluent nearly from the top of a mountain where mixing with the air is rapid. The NESCAUM report also compiles the ambient PM2.5 particulate data from a valley floor where it's not hard to realize that this can quickly become a problem. It's beyond unjust to compare all OWB's utilizing this report.
- 6) The Department should comment on why actual control devices have not been proposed to be put on the OWBs. A fan in series with a mini cyclone along the stack would allow for a large capture of particulate matter (PM). The cyclone can be cleaned with the daily routine and the PM capture could be used in my garden to capture the benefits from potash, calcium carbonate and phosphate residue located in the PM. We can come up with better ideas than having to raise my stack to a height of eighty-five feet.
- 7) We learn that one amasses documents to support the thesis he/she is attempting to prove or disprove. The Department and the Air Quality Technical Advisory Committee (AQTAC) seem to start with the premise that ALL OWB's are detrimental to our society and proceeded to collect data to prove their point, while overlooking any information which did not support their cause. Many of the studies that I found showed older models that were crudely made and did not burn wood efficiently. Thirty years ago, I could find outdoor furnaces that created plumes of smoke. Times have changed and manufacturers have taken major strides in making their products "cleaner burning". I'm asking that we observe directly or study pictures of all types of chimneys—indoor, outdoor, fireplaces, etc. without seeing what type of stove it is connected to. Today, an unbiased observer would have a great deal of difficulty determining whether a chimney was from an OWB, an inside stove, or a fireplace. **Science is not partisan, but it sure seems so in this case especially when you take comment number four into account.**