

**From:** [John Francisty](#)  
**To:** [Dec Air Comment](#)  
**Cc:** [John Crouch](#); [jeg@hpba.org](mailto:jeg@hpba.org)  
**Subject:** Comments on proposed Air Plan for Fairbanks  
**Date:** Thursday, July 25, 2019 3:29:58 PM  
**Attachments:** [ADEC response.pdf](#)

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Dear Ms. Heil,

Please find attached a letter with our comments regarding the State Air Quality Control Plan, Vol. II: III.D.7.7, Control Strategies, Public Notice Draft, May 10, 2019

Regards,  
John Francisty  
Pacific Energy

July 24, 2019

Ms. Cindy Heil  
Division of Air Quality, ADEC,  
555 Cordova St, Anchorage AK  
99501

Re: State Air Quality Control Plan, Vol. II: III.D.7.7, Control Strategies, Public Notice Draft,  
May 10, 2019

Dear Ms. Heil,

Pacific Energy has been manufacturing solid fuel burning appliances for the North American market since 1978. Our focus is to only produce catalytic-free wood burning stoves that meet and exceed US EPA regulations. As of today, most of our product line is already certified to the upcoming US EPA 2020 "Step 2" 2 gm/hr emission limit. And as a member of Hearth, Patio and Barbeque Association (HPBA), we try to stay informed and active in all North American regulations and requirements. We recently learned that Alaska Department of Environmental Conservation (ADEC) has set out an Air Quality Control Plan to lower emission from a variety of sources, including wood burning appliances.

We applaud ADEC on their endeavor and support the initiatives set out in the aforementioned document except for one; stating that non-catalytic stoves have more uncontrolled emissions than a catalytic stove and using an instrument to test stoves that is not suited for this purpose. We are very concerned that the relatively short lifespan of a catalytic combustor and the significance of proper consumer operation to achieve test level performance in catalytic equipped stoves has not been taken into consideration. Catalytic stoves are not automatically cleaner nor do they have less uncontrolled emissions than a non-catalytic stove.

Catalytic combustors will degrade over time and can degrade even faster if not operated very specifically. Most catalytic combustor manufactures state that a combustor element must be replaced within 3 to 6 years, adding a large expenditure for the homeowner. In southern parts of the US, where wood stoves are used for around 3 months out of the year, a seasonal cost to replace a catalytic combustor is approximately \$40 compared to some of the northern states, like Minnesota (or Alaska) where stoves are used for 8+ months per year, the lifespan is around 2 years at a seasonal cost of \$99 to the homeowner. See excerpt below from website <https://www.woodstovecombustors.com/when-to-replace/>.

**Seasonal Cost of using a six-inch round catalyst (shipping including)**

Temperature Zone	Location Example	Annual Months Burned	Lifespan (Years)	Cost Per Season (Ceramic)	Cost Per Season (Steel)
3	Northern Minnesota	8.5	2	\$78	\$99
4	Adirondacks, New York	8	2+	\$74	\$88
5	Northern Indiana	7	2.5	\$62	\$78
6	Kentucky, S. Penn	6	3	\$56	\$70
7	S. Virginia, Arkansas	4	4	\$39	\$49
8	S. Ga., Coastal Wash.	3.5	5	\$31	\$40

Keeping in mind, as the catalyst deteriorates over time so does its ability to control emissions from the appliance. And if the catalytic combustor is not replaced once the catalyst has burnt out, it becomes totally ineffective and the stove emission rate will dramatically increase.

A study commissioned by the US EPA in 1998 confirms our comments.

The following is an excerpts from the:

***Residential Wood Combustion Technology Review Volume 1. Technical Report  
Dec 1998, prepared by Omni environmental, for the Environmental Protection Agency***

*“The two most common degradation effects seen in catalytic stoves are damage to the catalyst bypass and the deterioration of the catalyst itself either through physical breaking, peeling or plugging or through the loss of catalytic activity. Under normal use the emissions of particles from most catalytic wood stoves will increase, in some cases reaching conventional stove levels within five years of use due to the loss of catalytic activity”*

*“...under extended high temperature use a catalyst could fail very rapidly. Once a catalyst fails, the emissions for some models would be close to those from a conventional uncertified stove...”*

This means the emissions could reach up to 100 grams per hour.

**Conclusions**

*“The significant deterioration of catalytic activity often seen in catalytic wood stoves in a three-to-five-year time frame and the identification of viable approaches to ensure catalyst inspection/replacement continues to be an unaddressed problem”*

<https://nepis.epa.gov/>

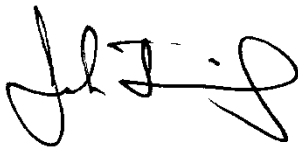
Most if not all catalytic stoves have a bypass device to allow the smoke and particulates from the fire to bypass, or go around, the catalytic combustor increasing emissions many times. The stoves own operating instructions stipulate to leave the bypass device open during lighting of the stove and to leave it open for an undetermined length of time to assure the fire is established and the combustor has time to reach proper operating temperature. During this time, the stoves emission rate is very high. It also states "**NEVER OPEN THE LOADING DOOR WITHOUT OPENING THE BYPASS DOOR**". Every time the stove door is opened to reload wood and/or to stoke the fire, the by-pass devise must be also opened to prevent smoke spilling into the living space. This allows the smoke to go around the combustor and out of the chimney, creating yet another uncontrolled emissions condition. And if the bypass device is accidently left open for extended periods of time, the stove will continue to discharge high levels emissions, way above certified levels.

Segregating out non-catalytic stoves based on measurements made by a device not designed for this type of application is not sound science. The Tapered Element Oscillating Microbalance (TEOM) device has not been properly vetted and tested to verify its ability to measure emissions from a wood stove. As far as we know, none of the US EPA certified labs have such a device, nor are they familiar with it to use in testing.

The TEOM instrument has poor sensitivity to semi-volatile particles due to the temperature and humidity conditions used. The instrument indiscriminately measures mass collected on the filter, and falsely assess any collected water droplets as aerosol mass. Wood fuel combustion, especially non-catalytic combustion creates varying amounts of moisture through its burn cycle, adversely affecting the TEOM readings. Also, as the TEOM instruments operate by measuring the change in frequency of a vibrating element, vibrations from external sources can interfere with the measurement, creating unreliable results. The device was never meant to measure emissions from a wood burning stove.

For these reason, we request ADEC re-consider its position on catalytic stoves and their belief that they have fewer uncontrolled emission periods and not use a device to measure emissions from a stove that is unreliable and has not been verified for its accuracy in this type of testing scenario.

Sincerely,



John Francisty  
Special Projects