

## Air Quality Pilot Study

In the summer of 2002 Alaska had over one million acres of woodlands burning. This was the worst and longest smoke advisory period since 1969. There were 15 days this summer that visibility in Fairbanks was severely reduced and Department of Environmental Conservation air quality advisory warnings were in effect. Due to a very mild and dry winter, the summer of 2003 is predicted to have even more fire hazard potential than 2002.

In August of 2002, William Reynolds, owner of Solutions to Healthy Breathing, conducted a pilot air quality assessment study. This study consisted of measuring particulates in various buildings in Fairbanks and comparing the results against a baseline of ambient outdoor particulate measurements. The EPA standards for allowable particulates with diameters of 2.5 microns is 65 micrograms/m<sup>3</sup> on a 24 hour average. PM-2.5 microns measuring devices were obtained from The University of Alaska. These air samplers were calibrated and read by Dr. Cathy Cahill, an Assistant Professor at The Geophysical Institute at UAF. Due to limited resources and measuring devices, the testing lasted only 5 days in August during the worst of the smoke incidents. Parameters and conditions observed were date/time, altitude, temperature, location from Fairbanks airport, precipitation, wind and reported visibility.

Buildings selected were:

- T 23 Older home with no active ventilation. or filtration system
- T 24 Older UAF office building with no air filtering
- T 25 Older home with an HRV system with carbon and particulate filters plus a forced air furnace with active charcoal filters installed
- T 26 Older home with no active ventilation & a small freestanding filter system
- T 27 New 5 star home with a Heat Recovery Ventilation System (HRV) without filtration,
- T 28 New home with an HRV system incorporating particulate and carbon filters in the system
- T 29 Newer home with no active ventilation or filtration system

Date	Samp #	Initial wt. microgm	Final wt. microgm	Difference microgm	Duration hours	Concentration Hourly microgm/m <sup>3</sup>	Fairbanks Baseline DEC Records microgm/m <sup>3</sup>	Interior Saturation
8/5/02	T23	44.812	45.5	0.688	3	166.2	233	0.713
8/6/02	T24	45.571	45.619	0.048	3	11.6	17.7	0.655
8/6/02	T25	44.764	45.02	0.256	4	46.4	373.7	0.124
8/7/02	T26	45.078	46.17	1.092	8	98.9	187.6	0.527
8/8/02	T27	44.06	44.62	0.56	6	67.6	119.3	0.567
8/8/02	T28	44.68	45.115	0.435	5	63	202	0.312
8/9/02	T29	44.454	46.412	0.958	14	49.6	98.9	0.502

The buildings that had both HRV and carbon filtration had markedly lower saturation of particulates. The building (T 25) with a carbon and particulate filtered HRV system plus an interior high volume recirculating air handler system with carbon filters had a

88% reduction in PM 2.5 particulates. The building (T 28) with an HRV system with carbon and particulate filters had a reduction of 69%. Both systems were designed and installed by Solutions.

The initial observations and results indicate a need for further home assessment and mitigation strategies. Solutions seeks to obtain funding for a 12 month study of Fairbanks homes to explore cost effective particulate arrestment and absorption devices. Indications of apparent abatement of airborne particulates as indicated in the sampling data show the need for additional sampling and assessments.

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