

Wood Buffalo Environmental Association
Human Exposure Monitoring Program
— Program Boundaries —



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**WOOD BUFFALO
ENVIRONMENTAL ASSOCIATION
HUMAN EXPOSURE
MONITORING PROGRAM
(WBEA—HEMP)**



**2006 MONITORING YEAR
SUMMARY REPORT**

**FORT McMURRAY FIRST
NATIONS GREGOIRE LAKE/
ANZAC**

APRIL 2008



The organizations listed below are recognized for their continued support and assistance of the ongoing monitoring program. It should be acknowledged that representatives for some of these organizations have changed over time and that the contributions of these individuals were valued and appreciated.

Wood Buffalo Environmental Association – Human Exposure Monitoring Committee (WBEA-HEMC)

Science Advisory Team of Alberta Health & Wellness

WBEA HEMC and the Science Team would like to thank the efforts of the project co-ordinator and field staff that were instrumental in the deployment of the 2006 Human Exposure Monitoring Program (HEMP).

Finally, the Science Team and WBEA HEMC would also like to gratefully acknowledge the contributions made by the volunteers from the communities of Fort McMurray First Nation Gregoire Lake and Anzac whose participation in this program was critical to its success.

Disclaimer: The organizations represented on the Human Exposure Monitoring Program Steering Committee are recognized for their contributions and support of the WBEA Human Exposure Monitoring Program. Although the program is directed by a multi-stakeholder consultation process, this scientific report may not reflect the views of these organizations. Any inquiries regarding the methods utilized in compiling and analyzing information and samples collected from the participants should be directed towards the Surveillance and Environmental Health Branch, Alberta Health and Wellness.

LESSONS LEARNED

Indoor sources of air contaminants are the biggest influence to personal exposure.

As we spend most of our time in our homes, we have to reduce indoor sources of air contaminants

What can I do?

- ◆ **Ask** people to not smoke in your home or vehicle.
- ◆ **Change** your furnace filters often to remove dust.
- ◆ **Do not** use air fresheners or scented cleaning products.
- ◆ **Turn on** fans in cooking hoods to remove grease particles from cooking oils.
- ◆ **Turn on** fans in washrooms to remove steam.
- ◆ **Buy** solid wood furniture. Pressed wood contains many types of VOCs.
- ◆ **Do not** run vehicles in garage or near the entrance to your home.
- ◆ **Make** sure your furnace is in good working condition.
- ◆ **Participate** in the monitoring program when it returns to your community.





VOLATILE ORGANIC COMPOUNDS

Volatile organic compounds (VOCs) are a variety of chemicals which contain carbon. Examples of the 13 VOCs tested are:

Benzene Toluene Ethylbenzene Xylene Octane

Outdoor

- ◆ Vehicle exhaust
- ◆ Industrial activities
- ◆ Gasoline & fuels

Indoor

- ◆ Cleaning products
- ◆ Paints & glues
- ◆ Carpets & furnishings
- ◆ Tobacco smoke
- ◆ Air fresheners
- ◆ Pressed wood products
- ◆ Wallpaper

Health effects from VOC exposure:

- ◆ Watery eyes and nose irritation
- ◆ Nausea
- ◆ Wheezing and coughing

Personal exposure to VOCs is determined by indoor sources.

- ◆ Three VOCs have ambient guidelines—benzene, ethylbenzene and toluene. None of the monitors exceeded these guideline levels.

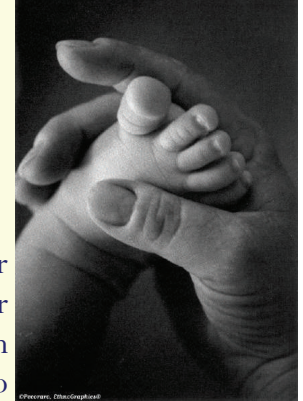
PURPOSE OF HEMP

What does HEMP mean?

Human Exposure Monitoring Program

Why human monitoring?

A lot of monitoring is done in our world. But it is rare that we monitor ourselves. HEMP is a program which monitors people and their exposure to contaminants in the air.



Why are we doing this?

We want to better understand:

- ◆ What pollutants we are being exposed to
- ◆ How we are exposed to them
- ◆ How can we reduce or remove our exposure
- ◆ What health effects we may experience if we are exposed.

When was this started?

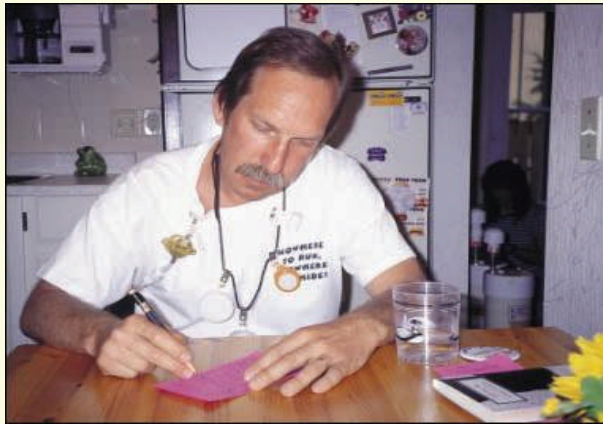
- ◆ 2005—completed in Fort Chipewyan and Fort McMurray
- ◆ 2006—Fort MacKay and Fort McMurray First Nations Gregoire Lake/Anzac
- ◆ 2007—Fort McMurray



WHAT DID WE DO?

A participant would:

- Wear personal air monitors to sample the air in their breathing zone for 24 hours per day for 7 consecutive days.
- Have air monitoring stations set up inside and outside their homes.
- Answer questions about their health, diet and other life-style factors.



- A map showing the program area is located at the end of this report -

PARTICULATE MATTER (PM_{2.5})

Due to equipment failure, this portion of the program was not completed for these participants.



OZONE (O₃)

Ozone is gas produced by or from:

Outdoor

- ◆ Naturally produced in the atmosphere
- ◆ Industrial activity

Indoor

- ◆ Arcing of electric motors
- ◆ Improperly working air cleaners
- ◆ Smoking

Health effects from O₃ exposure:

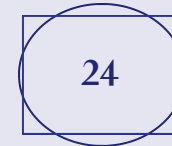
- ◆ Cough
- ◆ Chest discomfort
- ◆ Nose and throat irritation

All monitors detected O₃ below current guidelines.

- ◆ Personal and indoor monitors detected ozone at very low levels.
- ◆ Highest levels of O₃ were detected outdoors.
- ◆ Important to understand that O₃ can be destroyed easily by other air pollutants. Therefore, outdoor levels are not good indicators of personal exposure.
- ◆ For these participants, exposure to O₃ appears to be related to indoor levels or sources.

ABOUT THE PARTICIPANTS

How many participants did this program have?



What did we learn about them?

- ◆ More women enrolled in the program than men
- ◆ Many were over 40 years of age
- ◆ Employed in a variety of jobs
- ◆ Exposed to second hand smoke for 3 hours per day
- ◆ Lived in this community for over 5 years
- ◆ Spent 80% of their time indoors at home

Why do we collect this information?

- ◆ To understand how people are exposed to air contaminants





NITROGEN DIOXIDE (NO₂)

NO₂ is a gas produced by or from:

Outdoor	Indoor
<ul style="list-style-type: none">◆ Vehicles◆ Power Plants◆ Oil and gas plants◆ Forest Fires	<ul style="list-style-type: none">◆ Gas appliances◆ Unvented combustion appliances◆ Smoking

Health effects from NO₂ exposure:

- ◆ Lung irritation
- ◆ Eyes, nose and throat irritation
- ◆ High levels of respiratory illness

All monitors detected NO₂ lower than existing air quality guidelines.

- ◆ Personal levels are very similar to indoor and outdoor levels.
- ◆ Personal exposure appears to be related to both indoor and outdoor sources.

SULFUR DIOXIDE (SO₂)

SO₂ is a gas produced by or from:

Outdoor	Indoor
<ul style="list-style-type: none">• Diesel vehicles• Gas plants• Pulp and paper mills• Power plants• Boilers	<ul style="list-style-type: none">◆ Off gassing from fabrics and furnishings◆ Damaged building materials

Health effects from SO₂ exposure:

- ◆ Lung irritation
- ◆ Reduced lung function
- ◆ Nose and throat irritation

All monitors detected SO₂ below existing air quality guidelines.

- ◆ All monitors detected levels which were very low.
- ◆ Outdoor monitors detected levels above personal or indoor monitors.
- ◆ Personal exposure appears to be related to levels in a person's home.