

# Update on Canada's National Radon Program

## Health Canada

### CARST 2014 Conference

### May 5 2014 - Jeff Whyte and Kelley Bush



# NATIONAL RADON PROGRAM

## Highlights:

- **Federal Building Testing Program** – roughly 15K buildings tested
- **Cross Canada residential radon testing project** – 13.8K homes
  - ~ 7% of Canadians living above the Canadian guideline
- **2010 National Building Code** – rough-in for radon mitigation system
- **Residential Radon-Thoron survey** – 3.2K homes from CMAs - thoron contributes on average about 3% to radon dose.
- **Development** of Canadian National Radon Proficiency Program **C-NRPP**
- **Radon research** to support program, policy and public guidance
- **Radon mitigation standards** via CGSB (Cdn General Standards Board)
- Extensive **radon education and awareness programs** across the country



# NATIONAL RADON PROGRAM

## Development of National Radon Mitigation Standards

Agreement with the Canadian General Standards Board (CGSB) to develop two National Standards for Canada:

- Radon Control Options for **New Construction** in Low Rise Residential Buildings - CAN/CGSB149.11
- Radon Mitigation Options for **Existing** Low Rise Residential Buildings - CAN/CGSB149.12
- Successful Technical Committee meeting was held March 2014



*Canadian General  
Standards Board*





## C-NRPP UPDATE - PROGRESS

**Canadian National Radon Proficiency Program** – launched April 2012

**Statistics** : Since April 2012, there are now **155** measurement certifications, **77** mitigation certifications and **11** Analytical labs certified through the program.

**Training** : Roughly **10** trainers providing C-NRPP approved courses (classroom/distance based training module). Number of offerings have risen substantially to cover geographic areas of the country. Online exams and proctoring currently being researched.

**Protocols** : C-NRPP adheres to Health Canada measurement/mitigation protocols. EPA/ASTM documents are referenced for QA practices or as necessary in mitigation practices.



# C-NRPP—ROLE OF HEALTH CANADA

## Going Forward

- Assist C-NRPP with the competency assessment of radon measurement professionals with a QA/QC oversight
- Provide French language assistance for all public enquiries about the program
- Canadian certification program is not administered by Health Canada
- C-NRPP is the credentialing body, providing all program management services in accordance with their Program policies
- CARST is interested in taking over the administration of the program in the longer term



## C-NRPP – DIFFERENT FROM U.S.

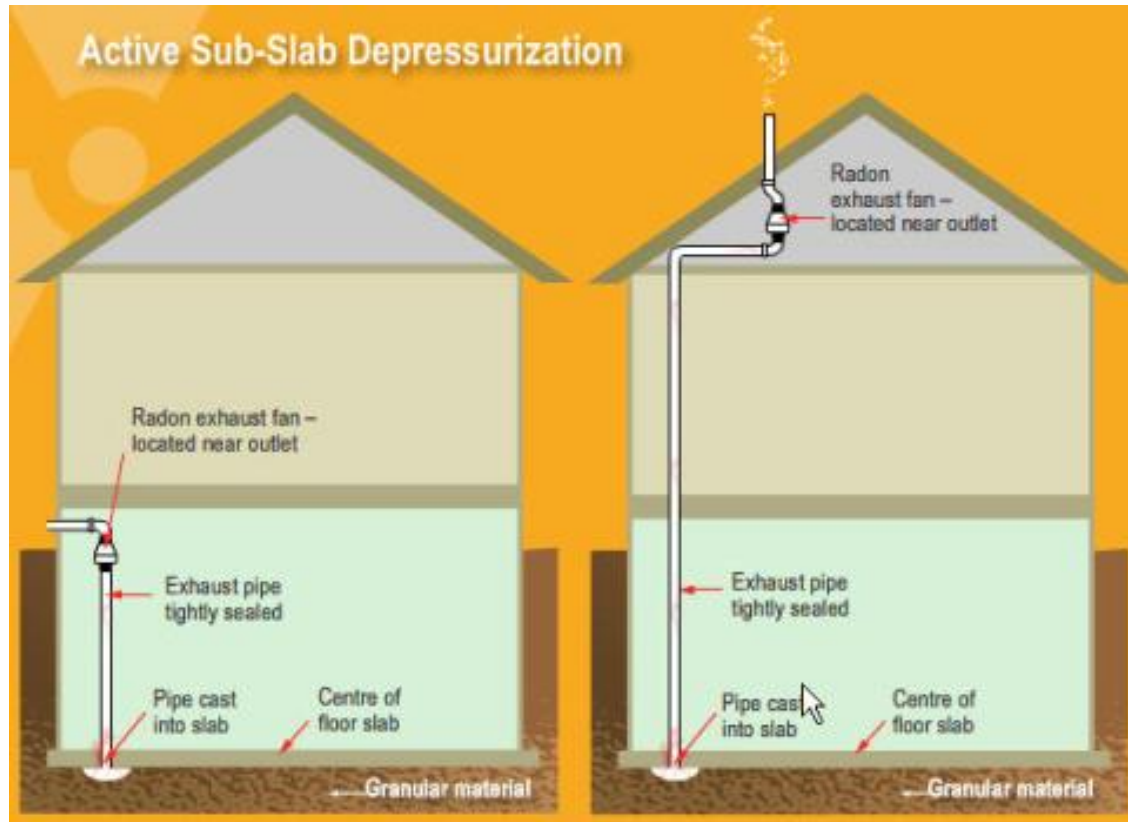
### Canada's program differs in:

- Metric Units : Bq/m<sup>3</sup> vs. pCi/L
- Long term testing recommended
- Quality assurance requirements – QA plans and quality control data submission
- Availability of Canadian Exams and certification documentation in both official languages in Canada
- Not tied to real estate transactions
- Mitigation Guidance: includes near-ground side-wall discharge and above roofline discharge for active sub-slab depressurization mitigation systems



# NATIONAL RADON PROGRAM

## Research to Help Decide Which Way to Vent?



# CURRENT RESEARCH

## Research to Help Decide Which Way to Vent?

- ASD Field study (REB 2013-0020) underway
- Roughly 50 homes with side-wall discharge in the Ottawa-Gatineau area
- Detectors are currently returning from field
- Analysis of the long-term detectors will be completed in the next month
- Real-time outdoor dispersion experiments will be conducted shortly
- Verify systems are functional and gather real-world statistics on percentage radon reductions achieved by the technique.





# CURRENT RESEARCH

## Research to Help Decide Which Way to Vent?

- ASD Field study (REB 2013-0020)
- Results from 18 homes so far
- Average radon reduction so far approx. 90%
- Highest radon reduction approx. 99%
- Remainder of long-term detector kits should arrive in the next 2-3 weeks
- Real-time CRM measurements near exhaust outlet to measure dissipation/dispersion to be conducted soon



# CURRENT RESEARCH

## Radon Emanation from Aggregate - Analysis in Progress

- Radon exhalation rates measured on 35 aggregate samples from across Canada
- Using worst-case scenario of 100% of emanating radon passing thru the slab for the highest sample, would contribute to 33 Bq/m<sup>3</sup> indoor radon concentration
- Most other samples would yield values far lower than this



# RADON RESEARCH GOING FORWARD

## Residential Mitigation Actions Follow-up Study

- Contact/recruit the participants from 2 large residential radon surveys who tested above the 200 Bq/m<sup>3</sup> guideline
- Ask questions regarding what mitigation actions were taken
- Ask questions regarding why mitigation actions not taken
- Offer free post-mitigation radon test to harvest statistics on radon reductions achieved by various mitigation strategies



## Feasibility of On-Demand ASD Fans

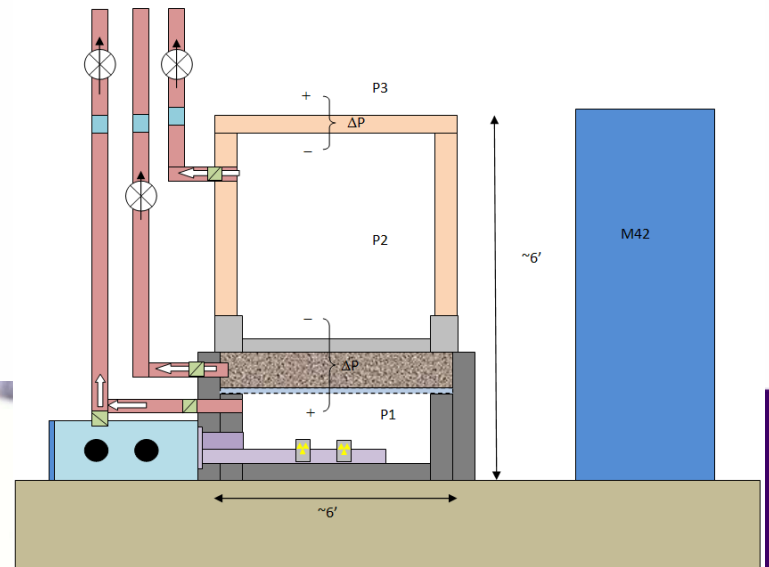
- Work with a builder to install a radon mitigation system which is linked to a CRM to see if fans can be run in an on-demand fashion (low speed continuously and full speed when required) rather than full speed 24/7



# RADON RESEARCH GOING FORWARD

## NRC Research

- Research on full vertical and side-wall passive stacks (CCHT)
- Downward migration of frost line with ASD (CCHT)
- Research on radon entry into building envelope (with NRC) using the Radon Infiltration Building Envelope Test System (RIBETS)
- Gable end roof discharge (CCHT likely)



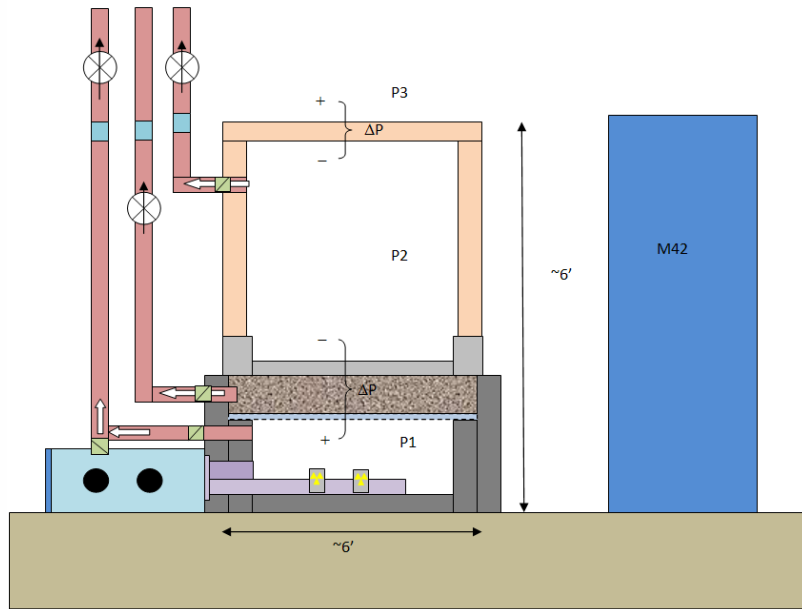
# NRC – INDOOR AIR RESEARCH LABORATORY (IARL)



# NRC - CANADIAN CENTRE FOR HOUSING TECHNOLOGY (CCHT)



# RIBETS





# RADON RESEARCH GOING FORWARD

## Refined Risk Estimates

- Combine data from the 2 recent residential radon surveys and lung cancer mortality data in an effort to obtain refined radon risk estimates
- Subset of the 1991–2009 Canadian census mortality follow-up study, a large cohort with 40,000 lung cancer cases in it
- Radon exposure at Health Region level and Forward Sortation Area level
- Individual lifetime exposure to radon will be estimated for each subject based on residential history and spatial radon distribution



# RADON RESEARCH GOING FORWARD

## Burden of Lung Cancer

- Population Attributable Risk in provinces for which there is sufficient population & cancer mortality data (i.e. : Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia)
- Provincial residential exposure distributions derived from 2009-2011 Cross-Canada Survey of Radon Concentrations in Homes (CCRS REB 2009-0011), the population and mortality (all causes and lung cancer) for Canadian provinces in years 2006-2009, and smoking prevalence in 2009 from Statistics Canada
- Allow computation of distribution of lung cancer deaths due to exposure to radon, and number of lives saved by mitigating homes with radon levels above the guideline of 200Bq/m<sup>3</sup> down to various levels



# NORM GUIDELINE UPDATES

- Canadian Guidelines for the Management of Naturally Occurring Radioactive Materials (NORM) set out principles and procedures for the detection, classification, handling and material management of NORM in Canada, and also include guidance for compliance with federal transportation regulations.
  - **Developed by NORM Working Group, a working group of the Federal Provincial Territorial Radiation Protection Committee**
- The basic principle of the Guidelines is that persons exposed to NORM should be subject to the same radiation exposure standards that apply to persons exposed to CNSC-regulated radioactive materials.
- Jurisdiction over use and radiation exposure to NORM rests with each Canadian province and territory.



# NORM GUIDELINE UPDATES

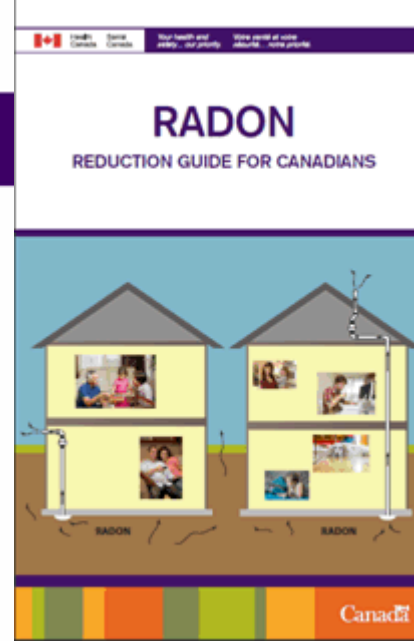
- Section 4.2.2 The Investigation **Derived Working Limit (DWL)** for radon was updated from 150 Bq/m<sup>3</sup> to 200 Bq/m<sup>3</sup>.
- Section 4.2.3 The DWLs for **NORM Management** for Radon were updated from 150 Bq/m<sup>3</sup> - 800 Bq/m<sup>3</sup> to **200 Bq/m<sup>3</sup>** - 800 Bq/m<sup>3</sup>.
  - **Steps to reduce this exposure should be taken and include: introduction of public and incidentally exposed worker access controls; changes in work practices; and reducing the radon concentration levels to below **200 Bq/m<sup>3</sup>**.**
- Section 4.2.4 - The DWL for **Radiation Protection Management** for Radon remains at 800 Bq/m<sup>3</sup> but guidance was updated
  - **The Radiation Protection Management requires the initiation of a dose monitoring program. Where possible, the program should include steps to reduce the radon concentration levels to below **200 Bq/m<sup>3</sup>**.**





# 2013 NEW Radon Outreach

- Launch of first annual Radon Action Month November 2013
- Launch of PSA health promotion campaign with Dr. Roberta Bondar
- Launch of a radon accredited on-line continuing medical education (CME) course for health care professionals
- Launch of a 3 Point Home Safety Checklist campaign and recruitment of radon leaders / champions in the childcare sector
- New RADON Reduction Guide for Canadians



# 2013 On-Going Radon Outreach

... **RADON** ...

Your **Family** May Be **At Risk**  
 Votre **famille** pourrait être à **risque**



Radon is a naturally occurring gas in the ground that can get into your home undetected. You can't see it, smell it or taste it.  
 Le radon est un gaz d'origine naturelle provenant du sol qui peut entrer chez vous à votre insu. Vous ne pouvez pas le voir, le sentir ou le goûter.

Long-term exposure to radon may cause lung cancer.  
 L'exposition à long terme au radon peut causer un cancer du poumon.

The only way to know is to test, it's easy and inexpensive.  
 La seule façon de savoir est d'effectuer un test, c'est simple et peu coûteux.

Protect your family's health - get informed.  
 Protégez la santé de votre famille - informez-vous.

[www.healthcanada.gc.ca/radon](http://www.healthcanada.gc.ca/radon)  
[www.santecanada.gc.ca/radon](http://www.santecanada.gc.ca/radon)

- Radon outreach through Canada Post's SmartMoves program to 600,000 + homeowners annually
- Distribution of Radon: Another Reason to Quit fact sheet - 200-300 pads of factsheets sent out to doctors office each month across Canada
- Pro-active radon outreach campaign in the fall / winter
- Events and conferences: Health Canada attendance at home shows, health care, real estate and home builders events across the country promoting radon testing and reduction, building codes and the Canadian National Radon Proficiency Program




**RADON**

A simple test can **save** your **family**  
 Un simple test peut **sauver** votre **famille**

You can't see it, smell it or taste it.  
 Vous ne pouvez pas le voir, ni le sentir, ni le goûter.

It can cause lung cancer.  
 Il peut causer le cancer du poumon.

Testing is the only way to know.  
 Faire un test est la seule façon de savoir.

It's easy to fix the problem.  
 Il est facile de réduire la concentration de radon.

[www.healthcanada.gc.ca/radon](http://www.healthcanada.gc.ca/radon)  
[radon@hc-sc.gc.ca](mailto:radon@hc-sc.gc.ca)  
[www.santecanada.gc.ca/radon](http://www.santecanada.gc.ca/radon)

# Radon Outreach Activities 2008-2014

## Activity Quantities\*

	<b>Outreach events</b>	<b>Brochures</b>	<b>Public Inquiries</b>	<b>Web - page views</b>
<b>2008/09</b>	32	0	212	15000
<b>2009/10</b>	73	166000	471	23000
<b>2010/11</b>	71	183000	759	34000
<b>2011/12</b>	89	401000	712	50000
<b>2012/13</b>	96	900000	1022	102000
<b>2013/14</b>	113	1038000	790	122,000

## Percentage Change

	<b>Outreach events</b>	<b>Brochures</b>	<b>Public Inquiries</b>	<b>Web - page views</b>
<b>2008/09</b>	na	na	na	na
<b>2009/10</b>	128.13%	na	122.17%	53.33%
<b>2010/11</b>	-2.74%	10.24%	61.15%	47.83%
<b>2011/12</b>	25.35%	119.13%	-6.19%	47.06%
<b>2012/13</b>	7.87%	124.44%	43.54%	104.00%
<b>2013/14</b>	15.04%	13.29%	-29.37%	16.39%

# 2014 and Beyond

- Continue to do outreach activities that are working
  - Smartmoves
  - Physician Hotline distribution
  - Radon Action Month
  - Targeted outreach to ‘at risk’ populations – smokers, young families, regions know to have elevated radon levels etc..
- Engage and encourage stakeholders to ‘get involved’ with Radon at a more grassroots level
  - Provinces / municipalities /health authorities
  - Health Professionals – doctors, nurses, respirologists ...
  - Industry – building / construction, real estate





# 2014 and Beyond

- Promote key tools and resources
  - Accredited continuing medical education course
  - CARST
  - C-NRPP
  - Radon Reduction Guide
  - Take Action on Radon
  - Standards (when they are completed)
- Work with stakeholder partners to find creative ways to get Canadians to reduce radon (mitigate) and make radon reduction more accessible to all!

