

# Moving from Results to Action for and Indoor Air Quality Pilot Project

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## A Community's Questions...

### Perchloroethylene (PERC)

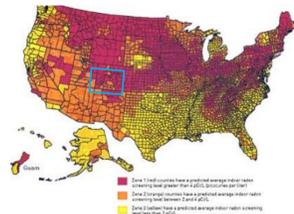
- Commonly used in dry cleaning & some household products
- Spills in other areas of Denver resulted in vapor intrusion of PERC requiring action
- Map: yellow indicates TNH2H neighborhoods →



"We have old dry cleaning facilities, could this be a problem in our neighborhood too?"

### Radon

- Naturally occurring, colorless, odorless
- 2<sup>nd</sup> leading cause of lung cancer in the US
- 44% of homes test above "Action level" in Denver County → added to study



## Background

- Taking Neighborhood Health to Heart (TNH2H) began as a community-based research project in 2006, working across five diverse neighborhoods in metro Denver.
- Mission:** "To provide a space and opportunity for people to share, support, grow, realize their visions for healthy neighborhoods, and find solutions to challenges...We embrace the following values that capture the spirit of our group and work: caring and commitment, collaboration, community, diversity and respect, empowerment, lending a hand, listening and learning, and participation."

(members of TNH2H)



## Methods

### Community Based Participatory Research

- TNH2H includes community members, and local research partners
- TNH2H CBPR Model Structure: Steering, Data Review and Dissemination (DRAD), and Food Committees<sup>b</sup>

### Perchloroethylene (PERC) Sampling

- Passive diffusion tubes (stainless steel filled sorbent tubes, analyzed according to EPA Method TO-17); Low-cost/pilot method: dosimeter tubes
- High-quality: \$100 ea.
- low-cost: \$8 ea.



### Radon Sampling

- ESML Short Term Kits (\$25 ea.)
- Includes temp and humidity corrections
- Certified by the National Radon Proficiency Program

### Project Planning

- Iterative process, researcher adapts design to incorporate community recommendations

### Fundraising

- TEX Successful Solutions Grant
- Crowdfunding (<http://experiment.com/iaq>)

### Hiring & Recruiting

- Paid coordinator to assist with sampling
- Participants (provided with thank you gift)

### Data Collection

- Sampling for radon and PERC in 15 homes

### Data Sharing

- Data and advice shared with participants
- Participatory analysis of de-identified data by TNH2H members

### Next Steps

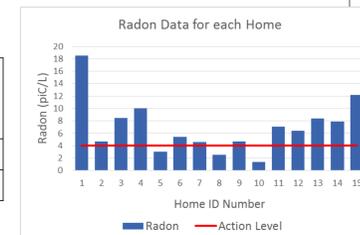
- Possible actions: broader dissemination of results, education and outreach to community, continued research

## Results

### Radon

- 12 of the 15 homes had radon levels above the EPA's recommended 'action level' (> 4 pCi/L).
- 5 of the 15 homes had levels more than *twice* the EPA's recommended 'action level' (> 8 pCi/L).
- Additionally, participants reported that they had never been warned to test for radon.
- Conclusion:** *More education and outreach is needed in this area to encourage radon testing and remediation.*

Study/Area	% of Homes Above 'action level'
Denver County*	44%
IAQ Pilot Project	80%



### Perchloroethylene

- No homes tested above or close to the CDPHE recommended 'action level', although two homes did test above typical background levels.
- Average: 1.58 ug/m<sup>3</sup>
- CDPHE Action Level: 43 ug/m<sup>3</sup>
- Curious about other VOCs, requested Total Indicated Compound Reports
- Some compounds of potential concern were found in more than 50% of homes (including toluene and benzene).
- Conclusion:** *TNH2H is interested in expanding VOC sampling beyond PERC to see what other VOCs residents may be exposed to.*

### Low-Cost Pilot Method Test

- None of the blanks reacted
- Wide variance between some pairs
- No apparent relationship between dosimeter tube response and PERC levels
- Using Total Indicated Compound Reports, we found correlations to the total amounts of the following VOC groups: arenes, carboxylic acids, esters, aryl halide.
- Conclusion:** *Dosimeter tubes may provide qualitative information regarding compound groups, but not reliable concentrations.*



## Action

The next steps described below include current and planned work (some of which are **funded/underway** and some of which we are seeking funding to complete).

### Radon Education and Outreach

- Large supply of radon kits (\$5 ea. in bulk)
- Community meetings for radon education and radon testing kit distribution
- Train Environmental Peer Advocates – community members with expertise in testing for radon and advising on remediation
- Pursue more resources for assistance with remediation
- \*SUCCESS: lobbied a Denver organization to include radon remediation in their Emergency Home Repair program, providing grants to low-income homes for repairs

### Continued VOC Sampling

- Expanded VOC testing will take place throughout the five TNH2H neighborhoods.
- This will include indoor and outdoor samples that will be quantified using a GC-MS – providing speciated data.
- The objective is to survey commonly found VOCs in the neighborhoods and homes, and use this data to inform actions to reduce any potentially harmful VOCs detected.

### Community Organization around Environmental Health Issues

- TNH2H is exploring the feasibility of convening community-driven councils in its footprint to investigate and respond to environmental issues using the IAQ pilot project as a model.

### Key Lessons in Moving from Results to Action

- A CBPR approach can successfully engage community residents in partnering with environmental scientists to investigate environmental conditions.
- Appropriate actions will depend on results and teams should be prepared to pursue multiple/different types of actions (from continued research, to advocacy, to education).
- Need to find ways to secure continued support from academia – relationship building between the University (not just the researcher or team) and the CBO
- Relationship building with other CBO's, projects, and local regulators can lead to collaborations and resources that support needed actions.