

Radon in Drinking Water: A Focused Discussion with the Public



The National Radon Meeting
November 10, 2004

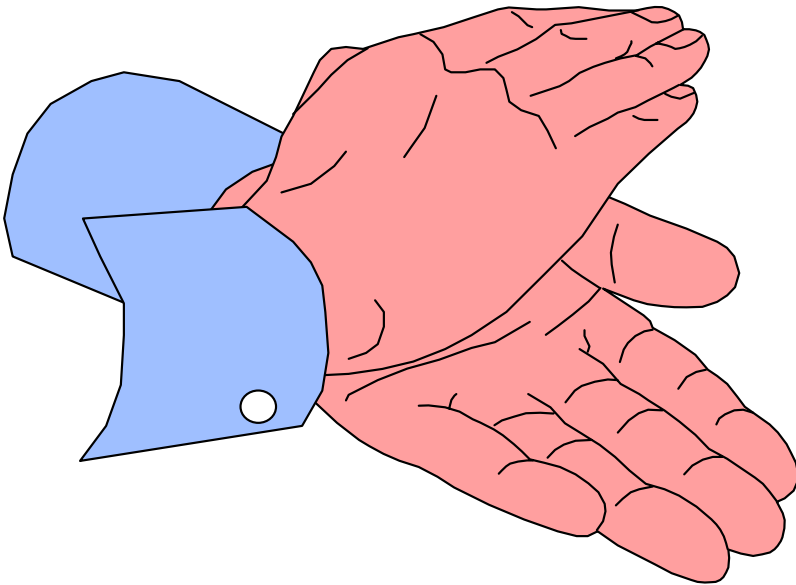
Patricia Gardner
NJ Department of Environmental Protection
Bureau of Environmental Radiation
(609) 984-5400
patricia.gardner@dep.state.nj.us

Disclaimer

- *“The results of this research are qualitative in nature and only representative of these respondents. Any inferences to broader populations must be viewed with caution.”*

Marketing Solutions Corporation

Acknowledgements



- Cathy Biel
- Jenny Goodman
- Branden Johnson
- Marketing Solutions Corporation

Problem

- There is no radon in water standard
- EPA proposed a risk trading standard in 1999 referred to as the Multimedia Mitigation Program (MMMP), but there has been no movement on finalizing the rule

EPA's Proposed Rule

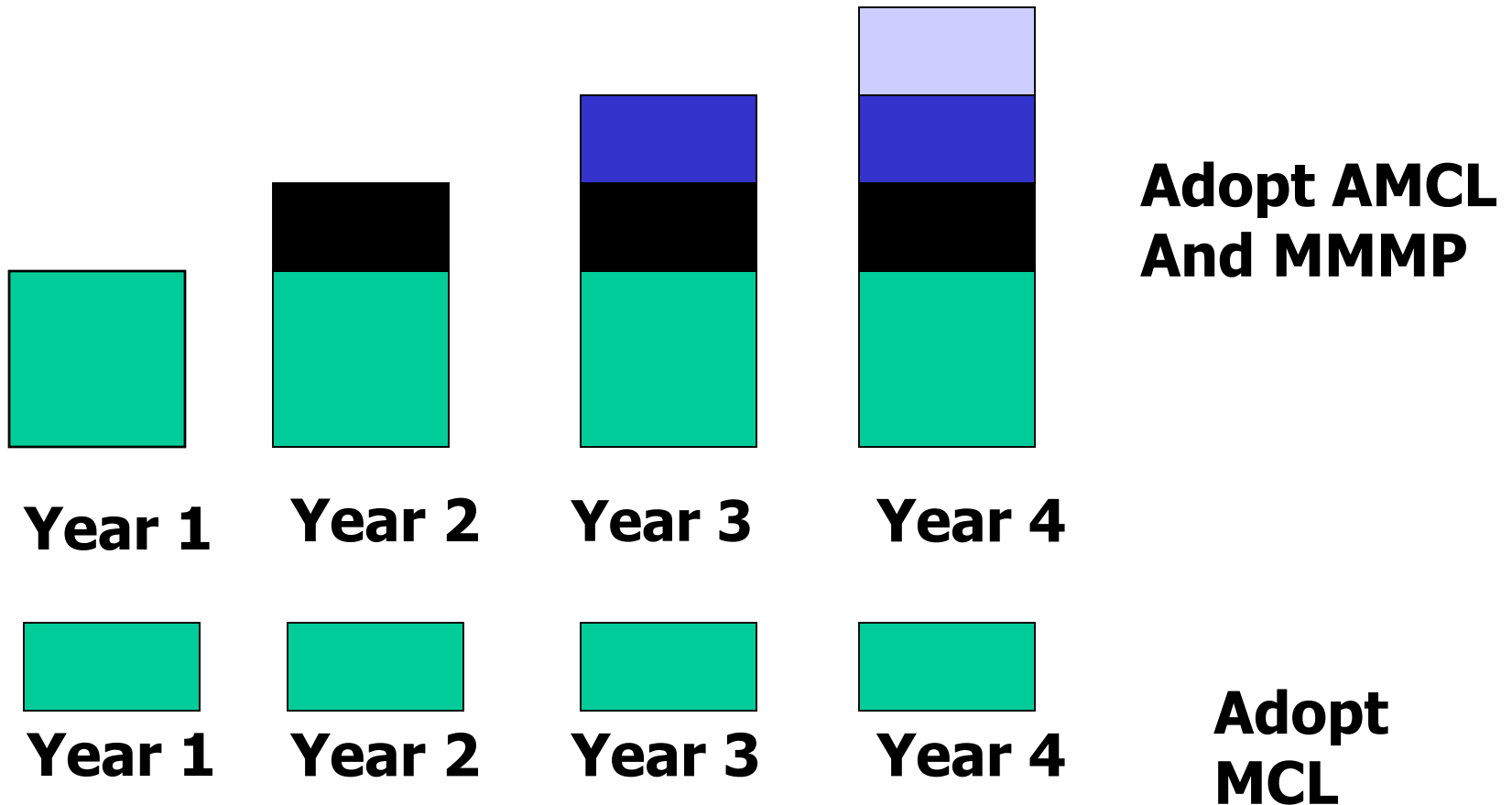
- Set a Maximum Contaminant Level (MCL) for radon in water at the 2 in 10,000 risk level (300 pCi/L)
- Set an Alternate MCL (AMCL) at the 3 in 1000 risk level (4,000 pCi/L)
 - If utility is over 4,000 pCi/L, must fix
 - If utility is between 300 and 4,000 pCi/L, don't have to fix water, but have to pay to enhance State radon in air program

Multimedia Mitigation Program (MMMP)

- Need letter from Governor to EPA that State is going to adopt AMCL and MMMP
- EPA monitors progress of radon in air program with a requirement that MMMP is expected to achieve equal or greater risk benefits than straight MCL
- Stakeholder buy-in of MMMP
 - put money into general radon in air program
 - still getting water in .2 to ~ 3 in 1000 risk range

MMMP: More bang for the buck.....

Risk Reduction Potential



New Jersey Buys in to MMMP

- Received funding from DW State Revolving Fund to start MMMP-related activities in anticipation of adoption
- Start Voluntary list of Radon in Water Mitigators
- Developed public information pieces with the assistance of the Division of Science, Research and Technology

Stakeholder input

- Hired a Marketing Firm to do focus groups
 - How do we explain this to the public?
 - The health of the many outweighs the health of the few
- Annual State Avoided cancer deaths
 - from 55 (with MCL) to 126 (with AMCL)
- Local Avoided cancer deaths are small, but some municipalities are higher with MCL than AMCL

Focus Groups

- Selected 5 municipalities that had radon in water levels between 300 and 4,000 pCi/L
- Hopewell, Hopatcong, Rockaway, Holland, and Mt. Olive
- Developed script for marketing firm and Handouts for participants
- Sessions videotaped, DEP personnel watched via close circuit TV

Recruitment Screener

- We were looking for
 - homeowners
 - 50% female & 50% male
 - specific water company customers
 - personal thoughts about own water quality

Give us **YOUR** opinion
about your water quality

Invitation: To Attend A Group Discussion



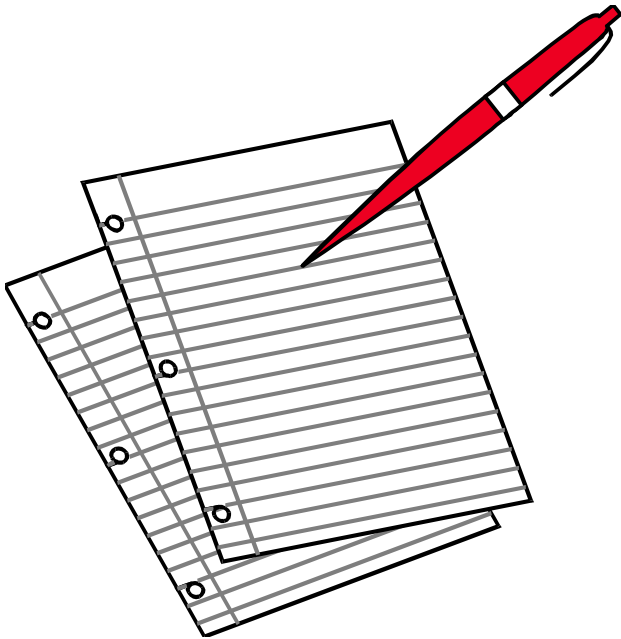
FOR YOUR PARTICIPATION, YOU
WILL RECEIVE **\$50**/HOUSEHOLD

The Group Discussion will take place on
Tuesday, April 27th: one session from 3-5pm and
another from 7-9pm at the **Hampton Inn** –
350 Morris Ave. in Denville

TO RESERVE YOUR PLACE, PLEASE CALL:
Marketing Solutions
1-800-326-3565

Reservations Are Required To Attend
(Only one session per household)

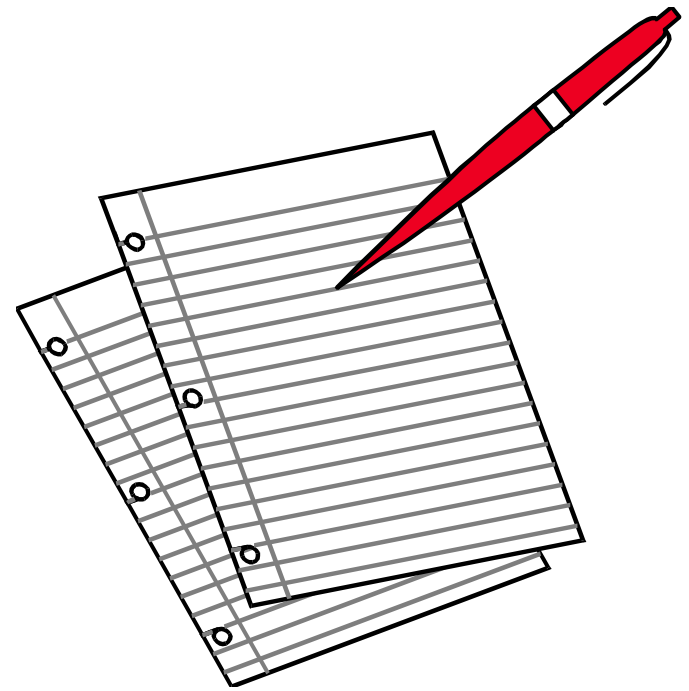
Initial Questionnaire



- Age
- Have you heard of radon?
- Rate your knowledge about radon
- Have you tested your home?
- Did you get levels above action level?
- Have you taken action to reduce radon levels in your home?

True or False Questions

- Radon comes from microwave ovens
- Radon can cause headaches and sinus problems
- Radon is the 2nd leading cause of lung cancer
- New homes as well as older homes can have radon problems
- Opening windows is always a reliable way to reduce radon levels
- Radon can be a problem in homes that are built without basements



Actual Knowledge

	True	False	% Correct
Radon comes from microwave ovens	3	44	94
Radon can cause headaches and sinus problems	22	16	33
Radon is the second leading cause of lung cancer	25	22	53
New homes as well as older homes can have a radon problem	45	3	94
Opening windows is always a reliable way to reduce radon	24	24	50
Radon can be a problem in homes that are built without basements	33	15	69

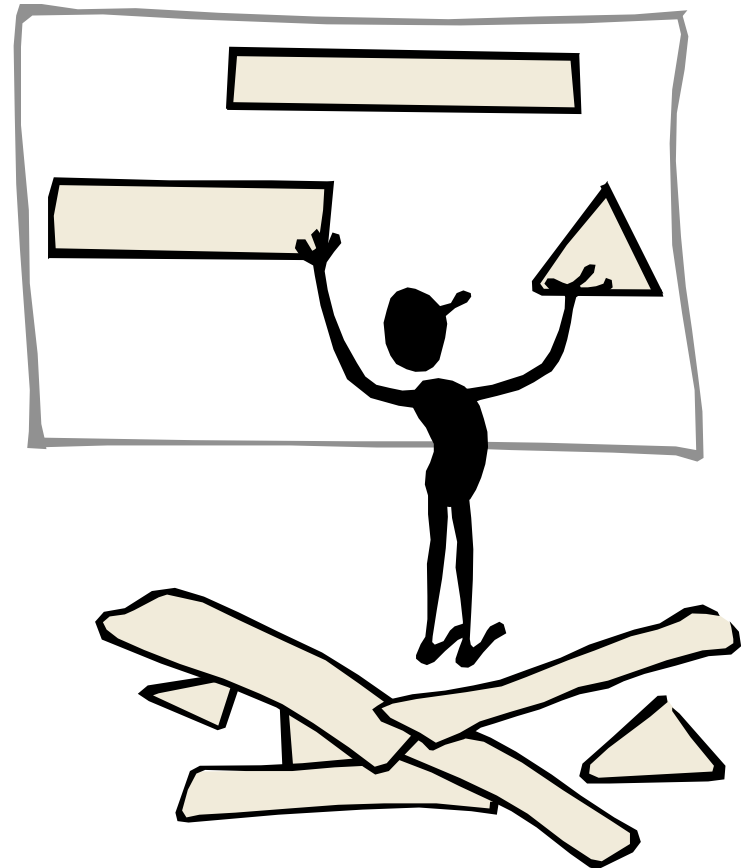
FOCUS GROUP DESCRIPTION

- 50 participants
- Men - 24 (48%)
- Women - 26 (52%)
- Age: range 27-81
 - mean=53.4 (s.d=13.5)
- 98% have heard of radon (DK=1, No answer=1)
- Self-rated knowledge: range=0-100 (mean=41 (s.d=27))



Focus Group Session

- Initial Questionnaire
- Introduction
- Background
- Decision Objectives
- Standard
- Policy Options
- Conclusion



Handout 1

Radon is an odorless, colorless, tasteless, radioactive gas that results from radioactive decay of certain substances in rock and soil.

Radon gas can filter up through the ground and pass through cracks in house foundations to get into indoor air (which is why its levels are usually higher in basements than in other parts of a home). Installing an effective radon ventilation system in existing homes, or building of a radon-proof foundation in new homes, lower radon levels in indoor air.

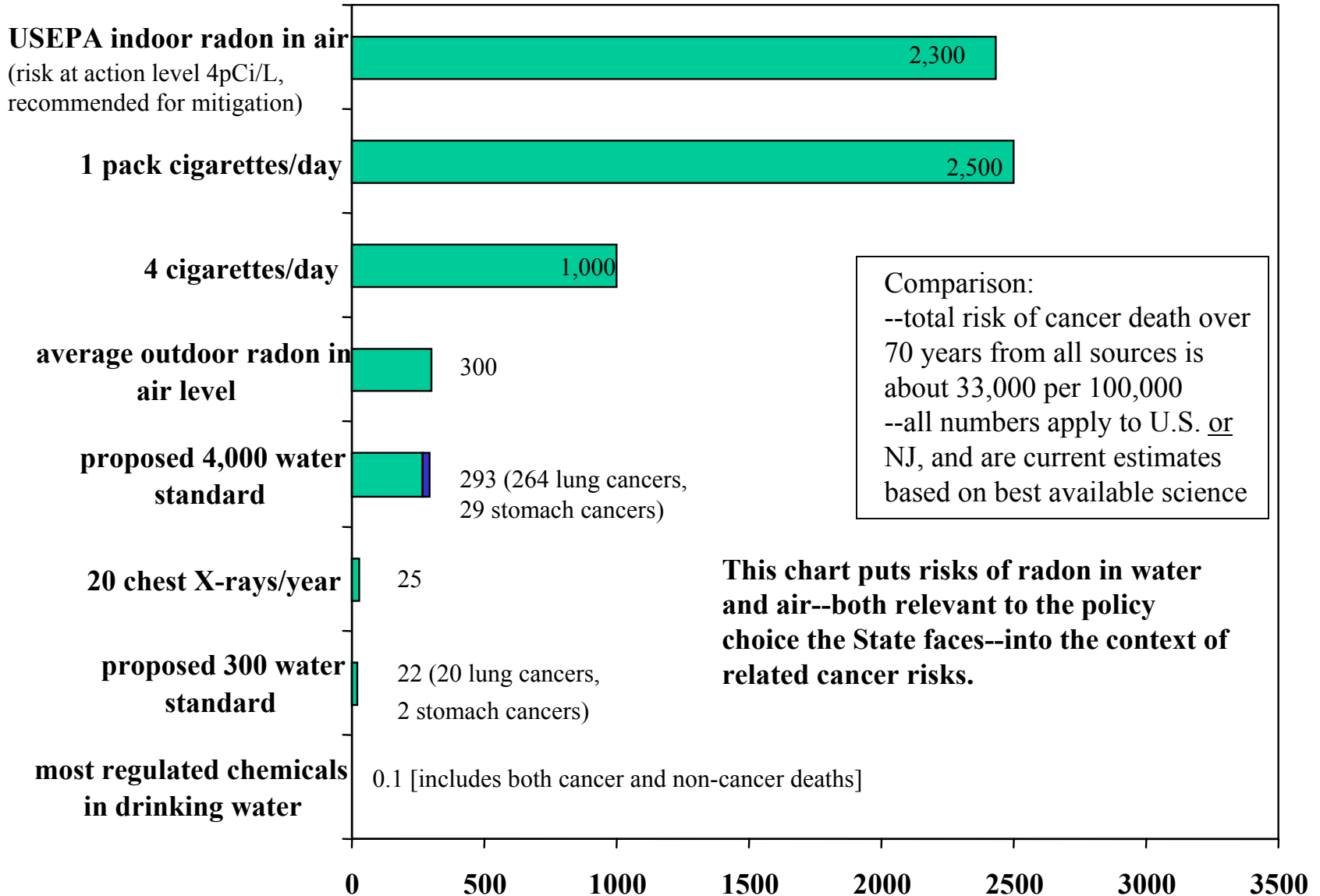
Radon is also picked up by groundwater passing through rocks and soil containing such radioactive substances; it enters water supplies when this water is pumped up a well. People can be exposed to radon in water in two ways: when it diffuses into the air from running water (as during a shower) and is breathed in, and by drinking the water. Most of the risk from radon in water is from breathing it, not from drinking it.

Breathing radon into the lungs, whether it filters into indoor air directly from the ground or diffuses out of water, might eventually lead to lung cancer. Radon accounts for about 12% of all lung cancer deaths, and is the second leading cause of such deaths; people who are smokers are almost 90% of the fatalities from radon. When people drink water that contains radon, they might get stomach cancer; this risk is not affected by people's smoking history.

[When instructed to do so, put a check in the appropriate box to indicate the importance of each consideration in making these choices.]

What objectives should be considered in making choices about radon in drinking water?			
Objectives	Importance		
	Very	Somewhat	Not
HEALTH: how many lives might be saved if a particular policy is chosen?			
HEALTH: how many lives might be lost if a particular policy <u>is</u> chosen (for example, due to the way it reduces radon levels)?			
COST: how much will a policy cost the State budget (and thus taxpayers)?			
COST: how much will a policy cost water utility customers?			
FAIRNESS: how fair will the policy be to people in different situations (for example, house versus apartment dwellers; different locations; adults versus children)?			
TIMING: when would the policy happen? how long would it last?			
EFFECTIVENESS: how likely is the policy to work?			
EFFICIENCY: how much benefit would be gained for each dollar spent?			
UNCERTAINTY: how definite are the benefits and costs?			
RANKINGS:			
1.	Last Choice -		
2.			
3.			

Potential Cancer Deaths from Lifetime Exposure to Radon and Other Sources per 100,000 Exposed for 70 Years



- **Municipality A Tier 1**
- Current radon level in water: 1610 picoCuries per liter

- Current policy: No standard for radon in drinking water

- NJDEP's current Radon in Indoor Air Program
- an outreach program that operates a toll-free Information Line, develops and provides educational materials, speakers, and displays at conventions and community events.
- certification of radon testers and mitigators (examinations, inspections, and enforcement)
- required radon testing in every school and day care center in the state (mitigation not required)
- required radon-resistant foundations for new homes built in Tier 1 areas.
 - New Jersey classifies the state into Tier areas based on the percentage of indoor-air radon test results over 4 pCi/L, the EPA action level (because it deals with air, this action level is not the same as the 4,000 standard for water). Tier 1 (with 24% of states population) has 25% or more homes with levels above 4 pCi/L, Tier 2 areas (with 44% of states population) have 5-24 % of homes over 4 pCi/L and Tier 3 areas (with 32% of the states population) have less than 5% of homes above 4 pCi/L. Tier 1 areas on average have the most radon risk in the state; Hopatcong is in a Tier 1 area.
- management of the Elevated Radon Awareness Program- through a grant from the US EPA, work with local Tier 1 communities to provide free testing to area residents

- **Policy 1:** All drinking water utilities meet a standard of 300 picoCuries per liter. NJDEP continues its current
- indoor air radon program. Policy 1 deals with water risks only, which at a 300 standard incur 22 potential cancer deaths per 100,000 people exposed for 70 years.

• **Policy 2:** All drinking water utilities meet a standard of 4,000 picoCuries per liter. Utilities and their customers will save money because they won't have to pay for extra treatment to meet the 300 standard. Under Policy 2, utilities with radon-in-water levels between 300 and 4,000 pay part of the money saved into a State fund, independent of the utilities, to pay for expansion of the indoor air radon program. This expanded program would include:

- required radon-resistant foundations for new homes built in Tier 2 areas
- help to pay for fixing radon problems in schools, preschools, and day care centers
- help to pay for testing of public buildings like libraries
- expand outreach program in Tier 1 and Tier 2 areas
- expand Elevated Radon Awareness Program to Tier 2 areas

- Policy 2 deals with risks of radon in air (3,000 per 100,000 potential cancer deaths at USEPA action level) and with water risks above 4,000 (29 potential deaths from drinking; 264 deaths from breathing radon from showers and faucets would be dealt with by the air program).
- Note: Costs for drinking water will go up to reduce radon risks regardless of which policy is selected. Getting utilities to meet the 300 standard and pay for extra indoor-air effort would require even more money, and the state Board of Public Utilities (which regulates how much utilities are allowed to charge customers) might not approve having water customers pay for air mitigation without the tradeoff. The state government's budget problems do not allow for expanding the current radon-in-air program without utility funds under Policy 2.

Statewide annual impacts:

	Current Policy	MCL at 300 pCi/L	Multimedia Mitigation Program
Avoided cancer deaths per year ¹	140	55	126
Cost	\$1.2 million	\$1.2 million, plus millions to remove radon from water (cost of Policy 1 for specific utilities is 8-100 times cost of Policy 2)	\$2.2 million (general fund to which utilities contribute the extra \$1 million)
Fairness	Indoor air program focuses on Tier 1- (24% of population)	Indoor air program unchanged. Utility areas with more than 300 pCi/L radon in water will have risks reduced;	Indoor air program applies to 68% of state's population (Tier 1 <u>and</u> 2) . Avoids 129% more deaths than straight MCL.

¹ Avoided cancer deaths per year = potential deaths estimated to be prevented by a specific policy. Policy 2 avoids more deaths despite a less strict water standard as it reduces the much larger risk of indoor air radon (see Handout 3).

Local annual impacts:

	Current Policy	MCL at 300 pCi/L	MMMP
Avoided cancer deaths per year	0 [risk from radon in water equal to risk reduction from current radon in air program]	0.13 or 7.7 years to avoid one death	0.12 or 8.3 years to avoid one death
Cost	No additional cost beyond minimum current water bill	Water utility bill - \$6.72 extra per quarter ; utility total \$77,000*	Water utility bill - \$0.35 extra per quarter ; utility total \$4,000
Fairness	Not applicable	Everyone using this water gets the same small reduction in cancer risk	Same number of cancer deaths avoided Statewide and locally with MMMP vs. MCL. However, fewer households get lower risk unless they test and mitigate. Extra funds will be spent where the most deaths will be avoided Statewide.

*This is the U.S. Environmental Protection Agency's estimate of cost. The utilities contend USEPA severely underestimated the costs.

First Impressions

- Risk numbers scary
- Information confusing
- Many did not like risk comparison with cigarette smoking
- Pie chart would be better
- Were surprised to hear that there is no MCL for radon in water

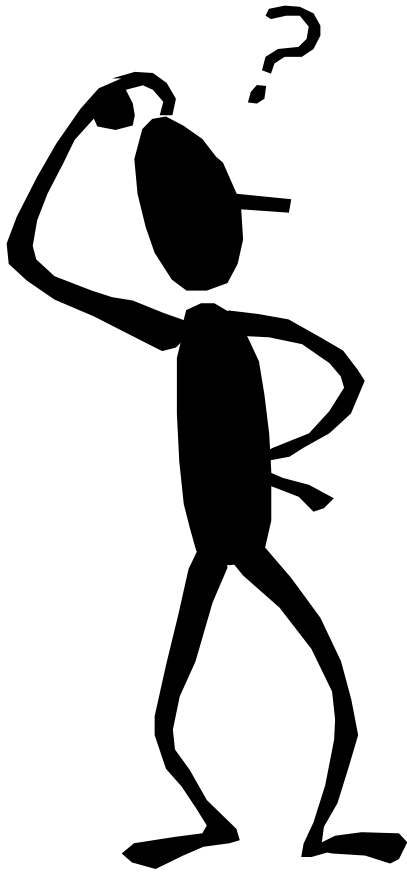


First Impressions



- Didn't like the term picoCurie
- Asked about private wells
- Wanted more definitive cost information
- Sources of radon
- Delete X-ray Comparison
- It makes you think

More First Impressions.....



- It's a woman thing.
- I can't take it on face value.
- Who ever wrote this is full of baloney.
- Do you want Dunkin Donuts when you can have Krispy Kreme?
- I have no basis for making a rationale decision.
- This is insane, bizarre
- I just figured out I live in the wrong area.
- What ever happened to Whitman?

Early Results

- Hopewell
 - No to MMMP
 - because local lives saved were lower than Statewide
- Hopatcong, Rockaway, Mt. Olive & Holland
 - unanimous - YES to MMMP

Conclusions

- Initial confusion turned to a basic understanding
- The concept of MMMP was not dismissed
- Ideas need further discussion & revision
 - format of information
 - use of graphics
 - areas of skepticism
 - misunderstood and desired information

Where do we go from here?

- Washington D.C. - Get EPA to promulgate MCL for radon
- Consider next phase in NJ's use of focus groups to assist w/ formulation of MMMP policy
- Use information to rework radon in air outreach materials



Questions?



Contact information:

Pat Gardner

patricia.gardner@dep.
state.nj.us

(609) 984-5400