NEW JERSEY’S PRIVATE WELL TESTING ACT: GEOGRAPHIC SUMMARY AND RECENT COMMUNITY INTERVENTION ACTIVITIES

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New Hampshire Arsenic Consortium
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Concord, NH
The unfortunate exposure paradigm for nearly 45 million Americans on private domestic water supply

Arsenic exposure reduction in the U.S. requires individual private well owners to take a series of protective actions

Barriers
Socioeconomic
Psychological
Situational/Logistical

Contaminated Private Well
Test Well
No Action
Mitigation Action
Exposed
Exposed
Exposed
Effective
Ineffective
Protected

Lamont-Doherty Earth Observatory
Columbia University | Earth Institute
A survey of neighbors of wells with high arsenic

230 private wells tested
30% of households previously tested for arsenic
Among the 70% who have not tested for arsenic:
  • 80% didn’t know arsenic was a problem in their area
  • 11% kept forgetting/never got around to it
  • 7% had never heard of arsenic before
  • 5% testing is too expensive
So what to do...?

• Test, Test, Test!
Private Wells in New Jersey

- NJ Population: 8.9 million (2015 est.)
  - 13% of the population (1,150,000 people) have private wells for their drinking water supply.
- An estimated 400,000 private (domestic) wells in New Jersey.
- No federal regulations cover private wells.
- Before 2002: state regulations applied only to newly-constructed wells.
• Became effective 9/16/2002.

• Real estate with wells. Untreated well water must be tested during real estate transactions for up to 35 parameters (county-dependent).

• Testing done by private, state-certified labs. Cost paid by seller or buyer (currently $450-600).

• Results provided to client and submitted electronically to the NJDEP.

• No action required if a parameter limit is “exceeded” (a right-to-know law).
What does New Jersey’s PWTA Measure?

**PRIMARY STANDARDS**
- Total Coliform (if positive, fecal or E. coli)
- 26 Volatile Organic Chemicals
- Inorganics
  - Arsenic (12 northern counties)
  - Mercury (9 southern counties)
  - Nitrates
  - Lead
- Radiological
  - Gross Alpha (12 southern and central counties)

**SECONDARY STANDARDS**
- Iron, Manganese & pH
Uncorrected Well Locations

Several People, Several Years To Correct Well Location Information
Regional Data Analyses

• As part of the PWTA any analysis must protect confidentiality of the homeowner

• Data were summarized by:
  – Municipality and County
  – a 2 mile x 2 mile grid
    • It was desired to evaluate data at a non-political boundary level.
    • A minimum sample size of 10 wells per grid was deemed acceptable for analysis.
    • A 2x2 mile grid provided for the retention of 98% of all wells sampled for statewide parameters.
    • In other words, 2.0% of wells were in grids with less than 10 wells.
Most Frequently Sampled:

<table>
<thead>
<tr>
<th>County</th>
<th>Wells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sussex</td>
<td>8,810</td>
</tr>
<tr>
<td>Hunterdon</td>
<td>8,456</td>
</tr>
<tr>
<td>Morris</td>
<td>7,923</td>
</tr>
<tr>
<td>Burlington</td>
<td>7,528</td>
</tr>
<tr>
<td>Gloucester</td>
<td>5,690</td>
</tr>
<tr>
<td>Ocean</td>
<td>5,598</td>
</tr>
<tr>
<td>Cape May</td>
<td>5,015</td>
</tr>
<tr>
<td>Atlantic</td>
<td>4,995</td>
</tr>
<tr>
<td>Cumberland</td>
<td>4,938</td>
</tr>
<tr>
<td>Somerset</td>
<td>4,796</td>
</tr>
<tr>
<td>Monmouth</td>
<td>4,613</td>
</tr>
<tr>
<td>Warren</td>
<td>4,187</td>
</tr>
<tr>
<td>Passaic</td>
<td>3,586</td>
</tr>
<tr>
<td>Salem</td>
<td>2,879</td>
</tr>
<tr>
<td>Mercer</td>
<td>2,413</td>
</tr>
<tr>
<td>Bergen</td>
<td>2,195</td>
</tr>
<tr>
<td>Camden</td>
<td>2,185</td>
</tr>
<tr>
<td>Middlesex</td>
<td>757</td>
</tr>
<tr>
<td>Essex</td>
<td>139</td>
</tr>
<tr>
<td>Union</td>
<td>60</td>
</tr>
<tr>
<td>Hudson</td>
<td>4</td>
</tr>
</tbody>
</table>

Municipality County Wells Sampled:

- West Milford Twp Passaic 2,316
- Franklin Twp Gloucester 1,938
- Vernon Twp Sussex 1,808
- Lower Twp Cape May 1,780
- Jackson Twp Ocean 1,741
- Raritan Twp Hunterdon 1,466
- Hopewell Twp Mercer 1,443
- Middle Twp Cape May 1,417
- Hopatcong Boro Sussex 1,289
Percent of Tested Wells that Exceed Specific MCLs in NJ

Naturally Occurring Arsenic and Radionuclides

Related to Human Activities
**Arsenic Exceedances**
Overall 8.9% of wells exceeded the NJ MCL and 3.0% exceed the Federal MCL

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Valley and Ridge</td>
<td>2.0%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Highlands</td>
<td>1.1%</td>
<td>0.5%</td>
</tr>
<tr>
<td><strong>Piedmont</strong></td>
<td><strong>17.1%</strong></td>
<td><strong>5.7%</strong></td>
</tr>
<tr>
<td>Coastal Plain</td>
<td>1.0%</td>
<td>0.6%</td>
</tr>
</tbody>
</table>

*Current through March 2014*
Arsenic – Percentage of wells exceeding 5 μg/L

Less than 10 Wells Sampled

Percentage of Exceedences of 5 μg/L

0%

>0 - 15%

>15 - 30%

>30 - 45%

>45 - 60%

>60 - 72.1%

n = 35,507 wells
Arsenic – Percentage of wells exceeding 10 ug/L
PWTA Data Display

Interactive set of web maps – website launched November 2015

http://arcg.is/1CPkHyC

Maps summarized by county, municipality, and 2 x 2 mile grids

Presents the number and percent of tested wells that exceed an MCL
NJ Private Well Testing Act Data Summary (Sep. 2002 to Apr. 2014)

Click a tab for more information then click a location on the map for data.

Click on a grid for PWTA data.

PWTA data are summarized within 2 mile x 2 mile grids to show the percent of wells that exceeded a maximum contaminant level (MCL) for each parameter and the number of wells sampled. Data is not reported in grids where less than 10 wells were sampled.

Areas not covered by a grid are areas where no wells were tested as part of the PWTA.

Please visit the PWTA webpage for additional information.
NJ Arsenic Awareness Website
http://njarsenic.superfund.ciesin.columbia.edu
or tinyurl.com/arsenichelp

- Videos on testing and treatment
- Health risk FAQs
- Testing options – list of labs
- Treatment guidance, FAQs, companies
Private Well Testing and Outreach Efforts
1. Convene professionals from all areas of the private well community;

2. Identify emerging and priority issues and develop innovative solutions;

3. Encourage partnerships and collaborations to ensure promotion and implementation of evidence-based program activities.
Private Well Testing and Outreach Events

FREE Water Testing for Arsenic and Boron
Fill your water bottle and return it by Thursday, May 26th

Dear Alexandria Township Resident:

Recent studies have shown that over 24% of the private wells in our Township have elevated levels of arsenic.

- Arsenic is naturally occurring in our local bedrock aquifers.
- Arsenic is known to cause cancer, increase the risk of many diseases, and may affect children’s IQ.
- Wells with arsenic may also have unregulated naturally occurring boron above USEPA health advisory levels.

FREE water testing for arsenic and boron is being offered to interested residents by Alexandria Township and the NJ Geological and Water Survey with support from a Centers for Disease Control grant. Your water test results will be strictly confidential, and a water test report will be emailed or mailed to you by the end of June. If arsenic or boron is found in your well water above levels of concern, you will also receive information about water treatment.

If you have any questions please contact:
- Alexandria Township Clerk, Michelle Rabinowitz at 505-568-3203 Ext. 210
- Jay Arancio, Alexandria Township Environmental Commission at jmarancio@gmail.com
- Dr. Steve Spadaro of the NJ Geological and Water Survey at steve.spadaro@dep.nj.gov

Please fold and attach the below form to your water bottle with a rubber band and return by Thursday May 26th.

Please circle one: 
- Yes
- No
- Not Sure

Help us understand the benefits of this type of program by answering the following questions:

1. Have you tested this well for arsenic in the past? ________________________________
   - Yes
   - No
   - Not Sure

   If YES:
   a. Did your well water exceed the drinking water standard for arsenic? ______
   b. Did you install a system to treat for arsenic? ______
   c. Why did you test for arsenic? Check all that apply:
      - Sold/Purchased Home
      - Neighbor Found High Levels
      - School Testing Event in 2016
      - Community Well Test Event
      - Other: ________________________________

2. Was today’s sample collected at the Kitchen Sink? ______
   - Yes
   - No
   - If no, where was it collected?

3. Do you have any of the following water treatment systems installed in your home? Check all that apply:
   - Water Softener
   - Neutralizer
   - Iron Removal
   - Chlorinator
   - Reverse Osmosis
   - Arsenic Removal
   - Carbon
   - Iodine
   - Arsenic Exchange
   - Ultra Violet Light
Testing from Alexandria and Kingwood Townships

Percent of wells exceeding an MCL*

<table>
<thead>
<tr>
<th></th>
<th>Alexandria</th>
<th>Kingwood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arsenic</td>
<td>24%</td>
<td>43%</td>
</tr>
<tr>
<td>Iron</td>
<td>23%</td>
<td>23%</td>
</tr>
<tr>
<td>Manganese</td>
<td>8%</td>
<td>29%</td>
</tr>
<tr>
<td>Radioactivity</td>
<td>1%</td>
<td>9%</td>
</tr>
<tr>
<td>Chemical Contam.</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

*PWTA Tests 2002-2014
Exceedance Rate
Overall: 24%

Arsenic (µg/L)
- 0 – 5.0
- 5.1 - 151
Alexandria and Kingwood Townships Arsenic Well Testing Results
385 wells tested through this program

- 50 Homes had Arsenic Treatment
- 11 (22%) Failed at the Kitchen Sink
- 93 Wells (24%) Exceeded the Drinking Water Standard
Hunterdon Medical Center Outreach

- Collaboration largely driven by Columbia University
- Grand rounds Hunterdon Healthcare System
- First pilot clinic in February, 4 additional clinics added June
- Healthcare provider interest
- Addition of postcard to encourage bottle returns
Contact Information

Nicholas A. Procopio, Ph.D., GISP
nick.procopio@dep.nj.gov

or:

• PWTA websites:
  http://www.nj.gov/dep/dsr/pwta
  http://arcg.is/1CPkHyC

• PWTA NJDEP:
  – Kristin Hansen (general calls)
  – Sandra Goodrow, Rob Newby (database maintenance and analysis)
  – Debra Waller (laboratory/method issues)
  – Rich Gunoskey (database/software issues)
  – Steve Spayd (treatment advice)

• Health Effects Information:
  – NJDOH: Jessie Gleason, Rebecca Greeley (Environ & Occup Health Surveil Program)
  – NJDEP: Gloria Post, Alan Stern (Division of Science, Research, & Env Health)

(firstname.lastname@dep/doh.nj.gov)