

My name is Dr. Josephine Rakow. I am a physician and the Health Officer for the Borough of Camp Hill, Pennsylvania.

I appreciate the opportunity to report the negative health effects of disinfecting our potable drinking water using chloramine as the secondary disinfecting agent. This is the 21st century. Since the early 1900's there have been major changes in medicine, the automobile industry, electronic technologies and the water industry. These changes came about as a process of evolution and are recorded in decades of records. They comprise a paper trail of reasons why old techniques are discarded and better methods are discovered or invented and adopted. So it is with the disinfection of drinking water with chloramine. What was used 90 years ago has been replaced and adopted by many water companies world wide – ozone, ultra-violet radiation, granular activated carbon, micro-filtration, nano-filtration, and reverse osmosis.

Our investigations have shown the following:

- 1) Chloramine leaches lead from lead pipes, lead solder, and lead and brass fittings. An example of this can be seen in the 2001-04 Washington, DC “lead in drinking water crisis” where thousands of children were affected by the lead-contaminated drinking water following the implementation of chloramine disinfection of their drinking water.
- 2) Childhood lead poisoning is a major preventable environmental health problem. Elevated lead levels are associated with harmful health effects ranging from children's learning disabilities and behaviors, hearing problems, problems with every organ in the body including seizures, coma and death.
- 3) Chloramine is a less effective biocide and is about 2000 to 100,000 times less effective than free chlorine for the inactivation of E. Coli and rotoviruses respectively.
- 4) The bi-products of chloramination, namely n-nitrosodimethylamine (NDMA) are believed to be the most toxic and carcinogenic chemical compounds known to man.

Nitrates in drinking water at levels about 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome or methemoglobinemia and recurrent acute respiratory infections.

DEPARTMENT OF HEALTH

Edward G. Rendell, Governor
Calvin B. Johnson, M.D., M.P.H., Secretary of Health

DUTIES AND RESPONSIBILITIES OF LOCAL HEALTH PERSONNEL

Health officers and sanitary officers shall attend all stated and special meetings of the board of health, and at all times be ready and available for prompt performance of assigned duties. Duties shall be performed as are vested by State Laws and Regulations, and Municipal Codes and Ordinances. They shall perform public health activities, including inspections, and shall execute the orders of the board of health.

In addition to duties outline in the municipal codes, responsibilities shall include, but not be limited to, the administration of the following public health programs.

1. **ASSESSMENTS OF COMMUNITY HEALTH NEEDS.** Collect, review and interpret data to identify community health needs. Coordinate services to meet the identified health needs of the population in an effective and efficient manner.
2. **FOOD SERVICE.** Conduct a comprehensive food service program to include inspections, training and consultation for operators and personnel of food establishments to prevent food-borne illness.
3. **INVESTIGATION AND FOLLOW-UP OF PUBLIC HEALTH COMPLAINTS.** Respond to requests for services that have public health significance; provide consultation and take actions to eliminate nuisances found to be health hazards.
4. **COMMUNICABLE DISEASE INVESTIGATION AND REPORTING.** Serve as an entry point between the medical community and the public health system for reporting purposes, prevent disease transmission through timely, effective and efficient control measures, and participate in epidemiological investigations.
5. **HEALTH INFORMATION AND REFERRAL.** Provide information to the community to promote disease prevention and health promotion among the residents of the community, utilize community health services and resources appropriately, and participate in community health decision-making.

APPENDIX B

County Name	BLL in micrograms/deciliter:				Total (#) Screened
	<10	10+ to <15	15+ to <20	20+	
Philadelphia	33,064	3,550	11	1,012	37,637
Pike	110	4	3	1	118
Potter	178	1	1,418	1	1,598
Schuylkill	371	23	1	8	403
Snyder	74	5	21	0	100
Somerset	118	4	2	0	124
Sullivan	18	1	5	0	24
Susquehanna	74	4	2	0	80
Tioga	117	3	1	1	122
Union	189	23	7	2	221
Venango	211	9	7	4	231
Warren	155	11	11	5	182
Washington	54	3	3	5	65
Wayne	98	1	0	0	99
Westmoreland	638	26	15	19	698
Wyoming	91	5	3	0	99
York	1,262	173	131	80	1,646
Out-of-State	110	2	3	4	119
Error-Corrected	1,057	60	11	12	1,140
Total Children	62,055	5,458	2,469	1,794	71,776
% of total tested	86.5%	7.6%	3.4%	2.5%	100.0%

Total Number of Children in PA <16 (Source: 2000 Census)

Total 2,588,014

2.8% (children screened as a % of all children in PA <16)

Number of Children in PA (2001) Source: EpiQMS, DOH, Bureau of Health Statistics

Age	Number of Children
00-04	733,496
05-09	796,775
10-14	855,160
Total	2,387,431

Source: P.A.L.L. Database

Period: January 2002 - December 2002

BIBLIOGRAPHY
(copies of cited works are available on request)

- “Chloroamine's Effect on Lead in Drinking Water,” *ES & T News* Vol 40, Number10: pp 3129-3130
- “Screening Young Children for Lead Poisoning: Guidelines for State and Local Public Health Officials,” *Centers for Disease Control*, November 1997.
- “Failing Our Children: Lead in U.S. School Drinking Water,” *New Solutions* Vol 20(1): pp 25-47.
- “Experiment confirms chloramine's effect on lead in drinking water,” *ES & T Online News* April 2006.
- “Exposure on Tap – Drinking Water as an Overlooked Source of Lead,” *Environmental Health Perspectives* Vol 118, Number 2
- “Out of Plumb: When Water Treatment Causes Lead Contamination,” *Environmental Health Perspectives* Volume 117, Number 12
- “Guidelines for Drinking Water Quality,” *The World Health Organization*, Vol 2, 1966.
- “Strategies for Minimizing Nitrosamine Formation During Disinfection,” AWWA, 2008.
- “Pinhole Leaks in Copper Plumbing,” *Task Force Study – Final Report*, Maryland Department of Housing and Community Development
- “Treatment Alternatives for Compliance with Stage 2D/DBPR: An Economic Update,” *Journal AWWA* Vol 102:3
- “Recurrent Acute Respiratory Tract Infections in Areas with High Nitrate Concentrations in Drinking Water,” *Environmental Health Perspectives*, April 1, 2009.
- “Accelerated Chloramine Decay and Microbial Growth by Nitrification in Premise Plumbing,” *Journal AWWA* Vol 101:11
- “Lead Leaching and Faucet Corrosion in PVC Home Plumbing,” *Science Daily*, June 7, 2008
<http://www.sciencedaily.com/releases/2008/06/080602091241.htm>
- “Blood Lead Levels in Residents of Home with Elevated Lead in Tap Water – District of Columbia, 2004,” *MMWR Weekly* April 2, 2004/ 53(12);268-270.
- “Elevated Blood Lead in Young Children Due to Lead-Contaminated Drinking Water: Washington, DC, 2001-2004,” *Environmental Science & Technology*, Accepted January 16, 2009.

“Water Analysis: Emerging Contaminants and Current Issues,” *Analytical Chemistry*, Vol 81, No. 12, pp.4645-4677.

“Occurrence, genotoxicity, and carcinogenicity of regulated and emerging disinfection by-products in drinking water: A review and a roadmap for research,” available online at www.sciencedirect.com available online 12 September 2007.

“Changes in Blood Lead Levels Associated with Use of Chloramines in Water Treatment Systems,” *Environmental Health Perspectives* Vol 115, No. 2: pp 221-225

“The Relationship Between Early Childhood Blood Levels and Performance on End-of-Grade Tests,” *Environmental Health Perspectives* Vol 115, No. 8

“Even Low Lead Exposure Linked to ADHD,” *ScienceDaily*, Retrieved from <http://www.sciencedaily.com/releases/2007/07/2007071203204513.htm>

“School-age Lead Exposures May Do More Harm than Earlier Exposures,” *Science News* June 6, 2009: p 13

“Even Very Low Levels of Lead Cause Brain Damage in Children,” *ScienceDaily*. Retrieved from <http://www.sciencedaily.com/releases/2007/11/200711071120111526.htm>

“Childhood Lead Poisoning Program: Pennsylvania Childhood Lead Poisoning Elimination Plan 2010,” Pennsylvania Department of Health