

PERC:

“Still toxic after all these years”

Contaminated Dry Cleaning Sites in NC

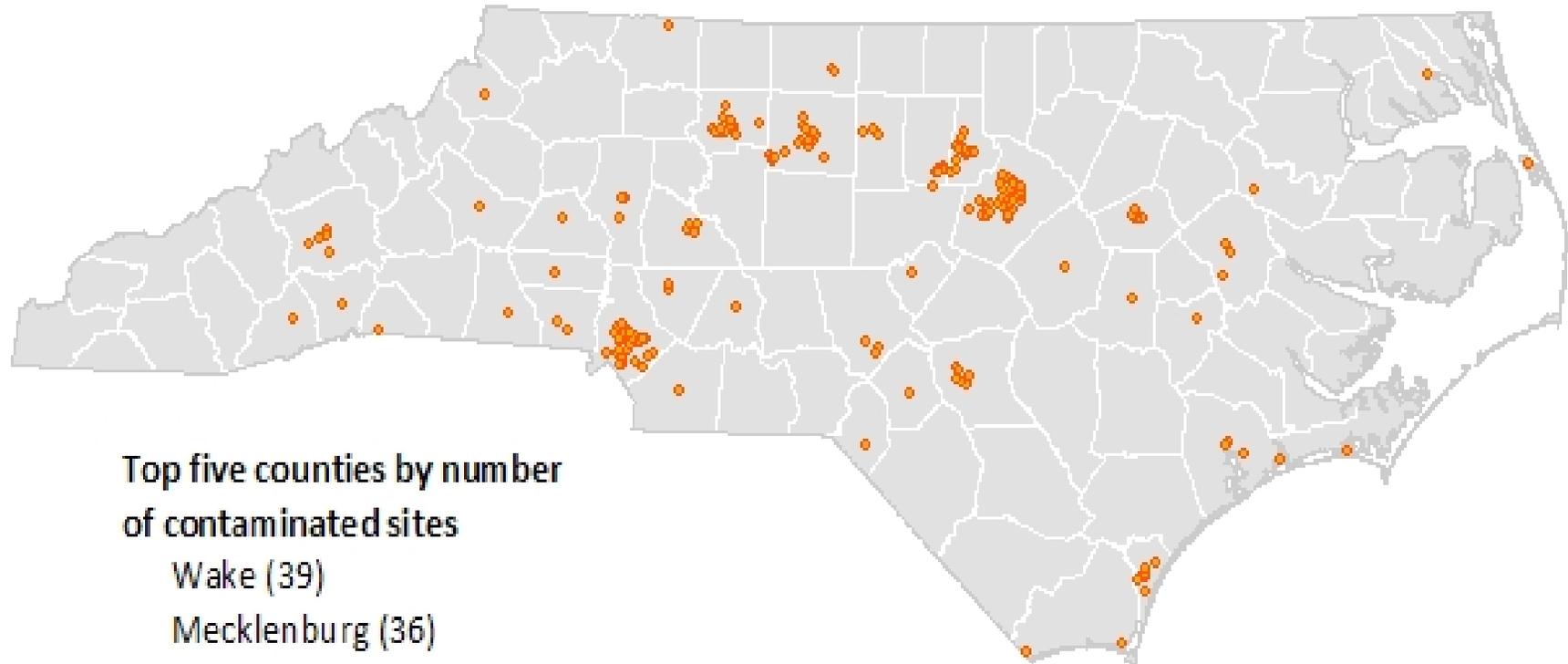


Blue Ridge Environmental Defense League
NC Healthy Communities
www.bredl.org

PERC: what is it?

- Introduced as a dry cleaning solvent in 1934; dry cleaning solvent of choice early 1960s
- Perchloroethylene, tetrachloroethylene, tetrachlorethylene, tetrachloroethene, PCE, PERC
- Colorless, nonflammable liquid, sweet odor
- Found in solvent soaps, metal de-greasers, aerosols, printing inks, adhesives, sealants, paint removers, lubricants, leather treatments, shoe polishes, typewriter correction fluid, spot removers
- Economical for dry cleaners: 1-55 gal. drum can clean 16,000 lbs of clothing
- 95,000 tons of PERC used annually by 35,000 cleaners throughout the United States and Canada
- Accounts for 80 to 85 percent of all dry cleaning solvents currently used in U.S.
- Estimated 2,000 active and abandoned contaminated dry cleaning sites in NC
- PERC continues to be used by over 400 drycleaners in NC
- Environmental and health toxicity known for 20+ years

Contaminated Dry Cleaning Sites in NC



Top five counties by number of contaminated sites

- Wake (39)
- Mecklenburg (36)
- Guilford (19)
- Durham (13)
- Forsyth (13)

Map represents 206 contaminated dry cleaning sites accepted into the Dry-Cleaning Solvent Clean Up Act (DSCA) program as of November, 2008, out of an estimated 1,500 contaminated dry cleaning sites across the state.

Health effects linked to PERC

Short-term exposure (low levels)

- Dizziness, sleepiness, irritated skin, eyes, nose, throat

Short-term exposure (high levels)

- Respiratory irritation, nausea, vomiting, headache, confusion, unconsciousness, death

Long-term Exposure

- Neurological effects, reproductive disorders, damage to central nervous system, memory loss, damage to liver and kidney, birth defects, heart defects, breast cancer, leukemia, cancers of the skin, colon, larynx, esophagus, bladder, intestines, pancreas, ovary, prostate and urogenital tract
- Chronic (long-term) toxicity to aquatic life
- Possible impacts on forests (chlorosis, necrosis, and premature needle loss seen in trees)

“Reasonably anticipated to be a carcinogen.”

- U.S. Dept of Health and Human Services

Classified as a “hazardous air pollutant.”

- US EPA

PERC's toxic by-products

- Toxic
 - Volatile
 - Persistent
 - Bioaccumulative
- Vinyl chloride
(carcinogen)
 - Phosgene
(lung irritant /hazardous gas)
 - Carbon tetrachloride
(liver toxin)
 - Trichloroacetic acid
(herbicide)
 - Dichloroacetic acid (DCA)
(harmful to aquatic organisms)
 - Dioxin
(carcinogen)
 - Chloral hydrate
(sedative/liver damage)
 - 2-chloroacetaldehyde
(severe irritant, liver cancer in mice)

How are people exposed to PERC?

■ Inhalation

Off-gassing of perc in dry cleaned clothing, showering with PERC-contaminated water
Movement of vapors through floors, walls of contaminated buildings
Handling by workers in dry cleaning establishments
Residents living in communities with dry cleaning establishments
Incineration of PERC residuals

■ Ingestion

Water – perc-contaminated drinking water supplies
Food - eating food contaminated with perc
Skin – irritant

■ Skin

Contact with PERC through handling, dry-cleaned clothing, environmental contamination

■ In utero

PERC passes through umbilical cord to fetus

■ Breast milk

Accumulates in fat tissue and released over time to blood

Health studies

- In the United States five studies of dry cleaning workers have found a significant increase in cancer of the breast, the kidneys and the cervix.
- Studies have found that chronic exposures to airborne PERC adversely affects neurobehavioral function in otherwise healthy individuals living near dry cleaning facilities.
- A study of newly dry-cleaned clothing in a residential closet found elevated PERC levels (0.5-2.9 m/3), levels that would require mitigation under the NC DSCA program.
- A recent Boston University School of Public Health study funded by the National Institute of Environmental Health Sciences found that babies born to women exposed during pregnancy to PERC in drinking water had a threefold increase in risk of birth defects.
- A recent study by the Food and Drug Administration in Washington measured levels of Perc (100 to more than 1,000 ppb) in butter bought from stores located next to dry cleaning establishments.

Who's responsible?

Dry Cleaning Solvent Clean Up Act (DSCA) program 1997

- State program created in 1997 to mitigate widespread contamination from contaminated dry cleaning sites
- Clean up fund established through sales tax revenues
- August 26, 2009, Senate Bill 700 extended sunset date of DSCA program to January 1, 2022
- Clean up fund balance: \$37.6 million (DSCA Oct. 2008 Annual Report)
- 226 sites certified under DSCA, 5 closed
- Mitigation not to exceed \$1 million per contaminated site
- Land use restrictions will be required for most sites
- Program under-funded, subject to budgetary shortfalls, revisions, and restrictions

Contaminated dry cleaning sites DSCA Program

- PERC contamination will be minimized, not eliminated
- Risk-based “clean up” – favored by dry cleaners. Costs less, sets lower limits for contaminants, groundwater compromised, public health compromised
- No compensation for affected residents re: health issues related to PERC exposure
- No compensation available to property owners with contaminated homes
- No incentives for dry cleaners to switch to cleaner, safer alternatives
- Contaminated dry cleaning sites will go unnoticed by majority of public due to lack of requirement to notify residents who live near such sites
- Residents who refuse to comply will continue to be exposed to PERC through contaminated drinking water wells
- Surface water and environment at risk because of non-compliance issues and lack of funding to mitigate contamination
- Dry cleaning businesses continue to use PERC resulting in further risks to public health and environment

Perc's heavy toll on NC

- Estimated 2,000 contaminated dry cleaning sites in NC
- Contaminated dry cleaning sites discovered in 42 counties
- High potential for public exposure to toxic chemicals
- Contaminated drinking water wells, community water supplies
- Residences, businesses connected to city water supplies
- 17 sites have impacted creeks, rivers and streams with perc contamination above NC DWQ 2B surface water standards
- Toxic PERC vapors have contaminated land, buildings, businesses, residences, people
- Residents exposed to PERC through vapors seeping through floors/walls
- Mitigation of PERC more difficult than oil spill cleanup
- Average cost of “clean up” for each contaminated dry cleaning site: \$330,000

Durham: PERC contamination

13 known contaminated dry cleaning sites

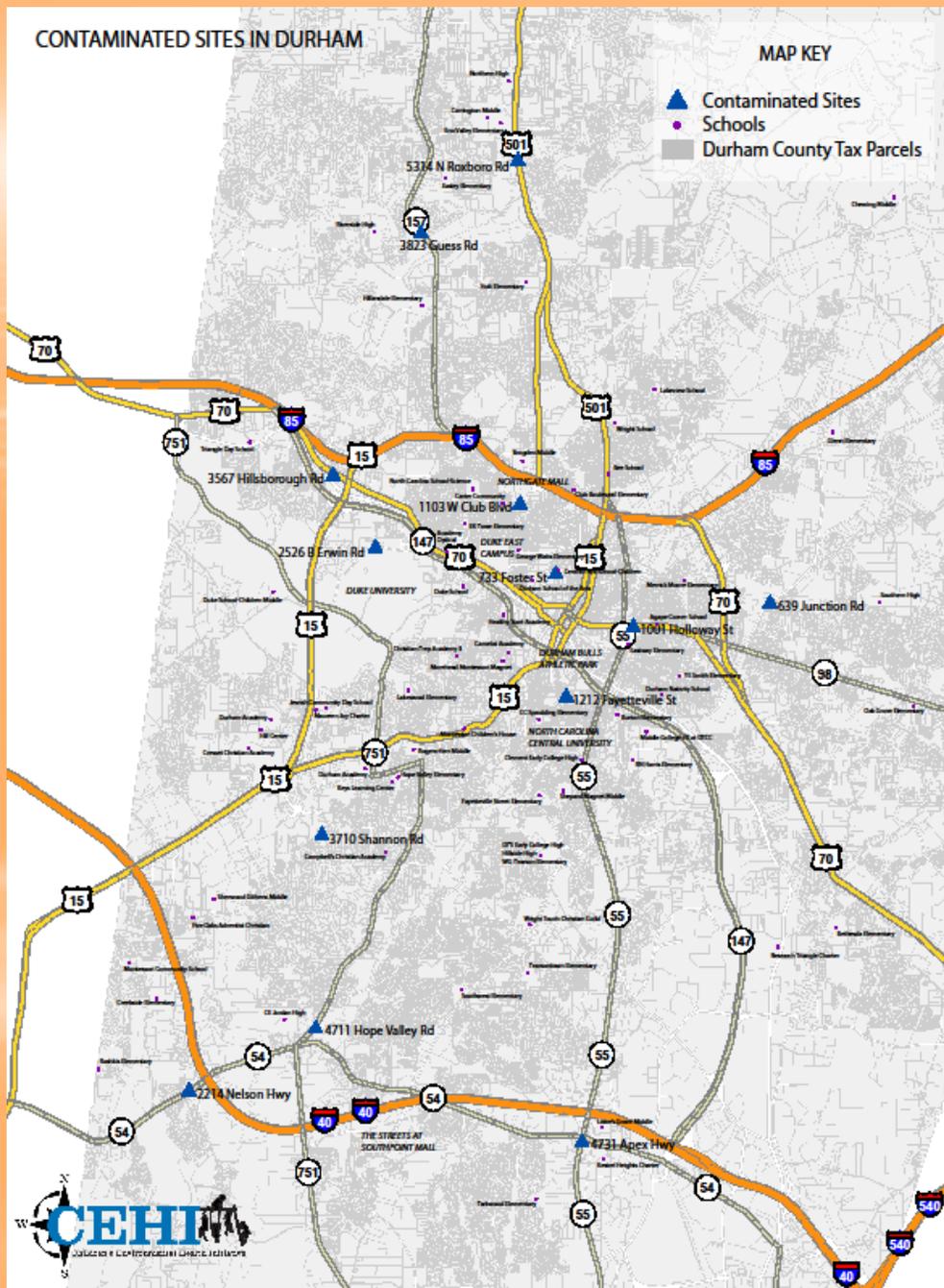
Groundwater at 12 sites impacted above NC DWQ 2L groundwater standard of 0.0007 ppm

- **Former BB&T:** Top priority site. Highest perc levels in groundwater recorded (70,000 ppb). Church congregation exposed to PERC vapors seeping through floors/walls that posed an “imminent risk” for up to two years while site being assessed. Air inside homes adjacent to PERC plume contaminated “higher than acceptable levels.” Remediation will be extremely difficult, cost of preferred remediation exceeds DSCA limit (\$2.3 million).
- **Weavers Cleaners:** Grossly contaminated similar to BB&T site. Soil vapor extraction system installed and reduced to unrestricted levels. Indoor air in 2-3 homes adjacent to site may be impacted by PERC vapors.
- **W.P Ballard:** Highest amounts of soil contamination, PERC by-products detected in 2 private wells below standards, monitoring mitigation costs \$1 million.
- **Plants Unlimited:** Ellerbe Creek and Goose Creek impacted above NC DWQ 2B surface water standards of 0.8 ppb. PERC detected at high levels in one residence, one business drinking water/water supply wells, connected to city water
- **Triangle Square Cleaners:** Day care center potentially at risk due to high flowing water discovered 70 ft. beneath surface carrying high concentrations from PERC (DNAPL)
- **Model Laundry/Church of Ephesus:** Impacts to Goose Creek above NC DWQ 2B surface water quality standards (possible overlap w/ Honeywell contamination) and possible vapor intrusion issues.
- **American Dry Cleaners:** Possible danger to “ecological receptors” - animals, plants, etc.

CONTAMINATED SITES IN DURHAM

MAP KEY

- ▲ Contaminated Sites
- Schools
- Durham County Tax Parcels



Camp LeJeune, NC

- Estimated 500,000 citizens and soldiers exposed to PERC contaminated drinking water from off-base dry-cleaner, ABC One Hour Cleaner
- Drinking water wells discovered contaminated with volatile organic compounds (VOCs) that included trichloroethylene, benzene, PERC
- One well primarily contaminated with high levels of PERC (215 ppb)
- 484 people diagnosed with cancer, other illnesses with 19 documented cases of male breast cancer – numbers growing
- 1,600 people filed claims seeking \$34 billion in damages
- ATSDR conducting a study of children born to mothers exposed to VOC-contaminated drinking water during 1968-1985 to examine cases of spina bifida, anencephaly (absence of all or a major part of the brain), cleft lip, cleft palate, childhood leukemia, childhood non-Hodgkin's lymphoma
- ABC One Hour Cleaner finalized as a National Priority Site in March 1989 and does not qualify for the DSCA program.

“The worst public drinking-water contamination in the nation's history.”

What other states are doing

- 1994: Dade County, FL, sues dry cleaners for contamination of 556 private water wells.
- 2000: City of Lodi, CA, filed suit in federal court against several dry cleaning businesses for contaminating water supply wells with PERC.
- 2006: City of Modesto, CA, sues dry cleaners for contaminating water wells, properties
- 2007: CA first state to pass legislation to phase-out PERC; expected to be completed 2023.
- CA Air Resources Board provides a \$10,000 grant to cleaners using PERC to switch to cleaner alternative.
- CA requires drycleaners to display a sign warning that PERC is a “probable human carcinogen.”
- NJ and other counties (Washoe, NV) considering bans on PERC.
- 2006: New dry cleaning machines installed in residential buildings are not allowed to use PERC (EPA, 40 CFR Part 63, National Perchloroethylene Air Emission Standards for Dry Cleaning Facilities).

What can you do?

- Buy clothing that doesn't require dry cleaning
- Patronize cleaners that use wet cleaning processes
- Advocate that your city or county provides information to the public re: risks of dry cleaning solvents
- Become involved in county or statewide programs to phase-out PERC with incentives for using cleaner, safer alternatives

For more information contact:

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*Healthy communities and a healthy environment
are achievable with fundamental shifts in
attitudes and practices. We welcome you to
join us in these efforts!*

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