

Addressing Health Impacts of Environmental Exposures at the Community Level



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National Center for Environmental Health
Agency for Toxic Substances and Disease Registry



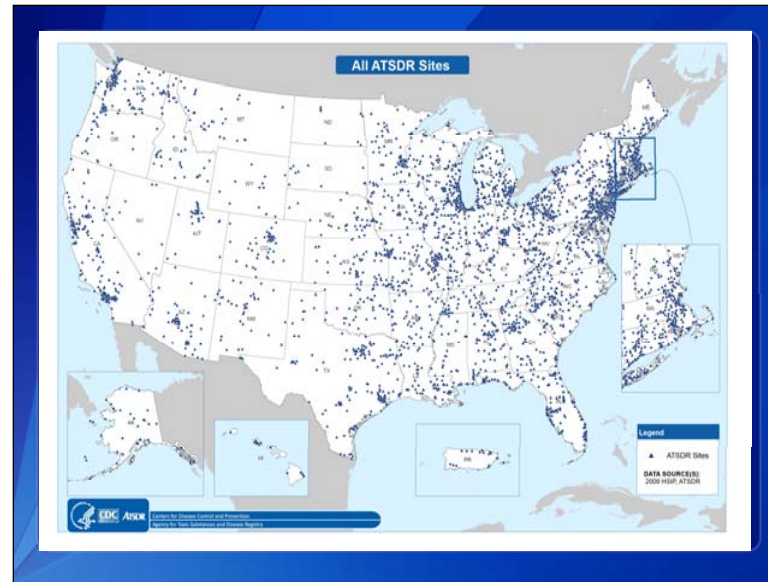
The Agency for Toxic Substances and Disease Registry (ATSDR)

ATSDR is a federal public health agency preventing harmful exposures and diseases related to toxic substance.





These sites are located throughout the U.S. Because of our unique structure, which includes field offices in all 10 regions of the U.S., we have direct access to the communities with which we engage.



All ATSDR sites-Picture of all the sites we have been engaged on the community level.

ATSDR Services

- Site Assessments
 - health assessments and consultations
 - exposure investigations
- Health Education
 - community outreach
 - health professional partnerships
- Expert Toxicological Advice, Toxicological Profiles
- Health Studies
- Emergency Response

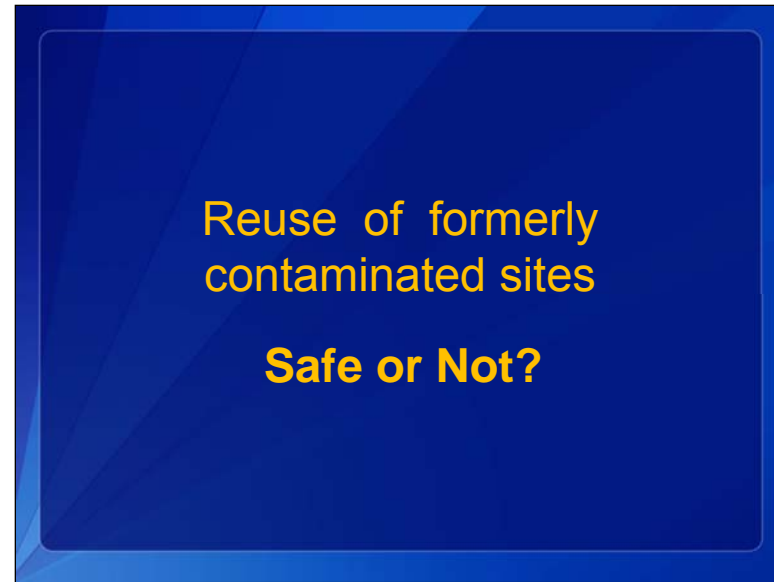


Photos from top to bottom

1. Treece KS – lead site. Top photo of chat pile and red circle is house located adjacent to chat pile.

2. Air testing with EPA in Alaska.

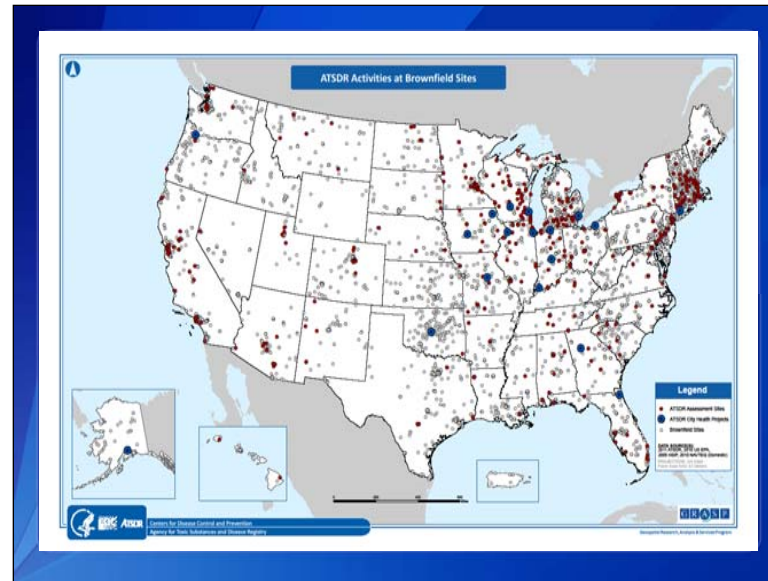
3. Talking to Eskimo about fish consumption.



Reuse of formerly
contaminated sites

Safe or Not?

One type of the sites we address are formerly contaminated sites. Sometimes, we are requested to engage in evaluation of the site before it is reused and other times are requested for assistance after exposures may have occurred. Approximately 500 sites, that ATSDR has been engaged in has involved the reuse of formerly contaminated sites. Our experience indicates that reuse of these sites can have negative and positive consequences. It requires that a careful look at the anticipated reuse and the impact of the residual contamination is necessary for success.



Slide of all the places we are engaged on formerly contaminated sites.

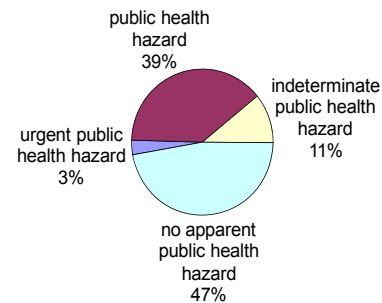
Legend

Red dot - ATSDR Assessment Sites

Blue dot- ATSDR Community Health Project (over 23 projects to date)

Gray dot - Brownfield Site

Health Conclusion Categories for Brownfield /Land Reuse Sites



When we assess health impact of sites, we designate categories of health threat from no apparent threat to those that potentially can cause adverse effects. Out of the 500 sites which were designated land reuse, approximately 40% of them posed a health hazard to individuals that came in contact with the residual contamination or physical hazards that remain on the properties. For one type of these sites, brownfields, which are sites which have real or perceived contamination, there are approximately 450,000 brownfield sites.

Most Common Recommendations

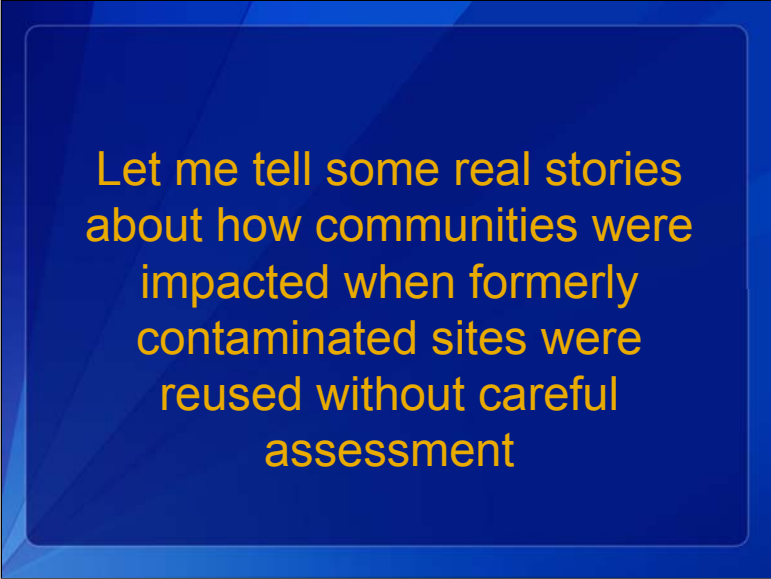
- Restrict access
- Remove physical hazards
- Conduct removal actions
- Impose deed restrictions
- Retain use of property to non-residential
- Re-evaluate proposed land use



We did not want to hamper reuse of properties , but want make that reuse is safe. Our most common recommendations for these properties have included:

- Restrict Access
- Remove Physical Hazards
- Conduct Removal Actions
- Impose Deed Restrictions
- Retain Use of Property to Non-residential
- Re-evaluate Proposed Land Use

Recommendations have approximately 70% adoption rate. Most common reason for not adopted is alternative action taken.



Let me tell some real stories
about how communities were
impacted when formerly
contaminated sites were
reused without careful
assessment

It is important that health entities (ATSDR, state health, local health, tribal health) are involved in redevelopment of contaminated sites.

- Environmental assessments may not address a community's concern about the health risks of the residual contamination or institutional controls.
- Public health issues have been identified at contaminated sites that need to be addressed in redevelopment. If not addressed, there could be new exposures with redevelopment.
- Public health can be and are involved in planning healthy communities successfully and improving community health overall.
- Public health departments are seen as a credible source of information for communities

Grand Street Mercury Hoboken, NJ



•Potential sources of elemental mercury in residential settings include mercury switches, mercury containing devices (e.g., thermostats and thermometers), and mercury obtained from laboratories, dental offices, or other industrial sources. In January 1995, pools of elemental mercury were found in a five-story factory building that had been converted to residential use in Hoboken, New Jersey; the building previously had been used to manufacture mercury vapor lamps.

•Nine months later, elemental mercury drops were identified in fourth-floor residential units. The mercury was located on stoves and countertop surfaces.

•Analysis of the elemental mercury vapor on the fourth floor ranged from 7 ($\mu\text{g}/\text{m}^3$) to 26 $\mu\text{g}/\text{m}^3$. The following month, urine mercury levels in five residents of the two fourth-floor units ranged from 11 micrograms per liter ($\mu\text{g}/\text{L}$) to 65 $\mu\text{g}/\text{L}$ of urine (the normal range is 0-20 $\mu\text{g}/\text{L}$).

•Additional urine analysis identified 20 more individuals with urine elemental mercury levels greater than or equal to 20 $\mu\text{g}/\text{L}$. Eight of those residents had urine mercury concentrations above 56 $\mu\text{g}/\text{L}$.

•Shortly afterwards, residents were urged to relocate as soon as possible. The building was declared an imminent health hazard; on January 4, the city of Hoboken condemned the building.

Waterbury Clock Factory Waterbury, CT



- Radium-226 has a half life of 1,600 years. This radioactive compound, when combined with zinc sulfide, was used to manufacture luminous paint. The luminous paint was used from the early 1900s through the 1940s to paint number dials on clocks, watches and equipment used in aircraft navigation.
- In 1998, a University of Illinois researcher was investigating the distribution of radium dial painters throughout the country. During the investigation, the Connecticut Department of Environmental Protection was informed that a former radium dial painting facility was located in the city of Waterbury, Connecticut.
- The Waterbury Clock Company produced clocks from 1857 through 1944. Starting in 1880, inexpensive watches were also produced. The first use of radium dial painting started in 1919.
- After operations at the facility ceased (unknown date), the building complex was reused as a leather clothier, an apartment complex, and a human service center.
- A radiation survey of the building complex identified isolated areas with radioactive material emitting radiation at levels (as measured at waist level) that may pose a public health hazard to occupants of the buildings. The occupants of twelve apartments were relocated.

New Jersey Child Care Center

New Jersey - KiddieKollege child care center established in an old thermometer factory

- Thermometer factory had been shut down, purchased by a local realtor and then used as a child care center
- In July 2006, center was shut down and ATSDR became involved
- New Jersey changed state licensing regulations for child care centers



- Accurtherm Inc. made thermometers at the site. Operations were shut down in 1994.
- In 2001, the building was purchased by local realtor. The building was renovated and received licensing to be a day care facility.
- The KiddieKollege day care was put into the building in 2004. In July 2006, the daycare shut down when elevated mercury reading were discovered.
- CDC/ATSDR became involved and provided assistance to the NJ Department of Health with analysis of testing of the children and staff as well as medical record reviews.
- When the daycare was originally licensed, all of the licensing requirements were met which included looking for lead, asbestos and radon. This incident resulted in New Jersey changing the day care licensing regulations in the state.

Pennsylvania Child Care Center

Pennsylvania - Child care center adjacent to dry cleaning establishment

- Indoor air samples revealed that levels for PERC were a potential health hazard for the children
- Dry Cleaner changed chemical usage
- City passed ordinance enhancing public health protection for buildings co-located with dry cleaning operations



•At the request of the Philadelphia Department of Health, ATSDR assisted with an investigation of a child care center that was adjacent to a dry cleaning business in a strip mall.

•Limited indoor air sampling of the child care center revealed that levels of tetrachloroethylene (PERC) were a potential public health hazard to the sensitive population of the child care center.

•Recommendations were made to inform parents and workers of the findings, conduct more sampling, locate the source of contamination into the child care center and eliminate the exposure.

•The Philadelphia Department of Health instructed the dry cleaners to control their emissions and they changed the cleaning agents that they were using.

•Additionally, the City of Philadelphia passed an ordinance to enhance the protection of public health for establishments collocated with dry cleaning operations that included increased monitoring and corrective actions

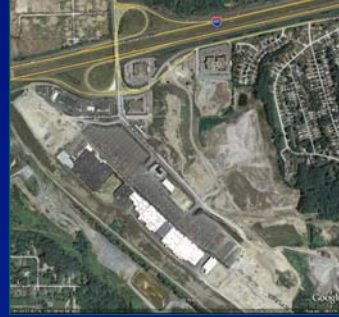
CityView Center (Garfield Heights, Ohio)



- CityView Center, Garfield Heights, Ohio
- 60 acre complex of retail chain stores and restaurants built over the closed Matousek and R&B Development Landfills
- Within 3 years of opening, Ohio EPA filed a complaint of injunctive relief for improper engineering of the cap, leachate management, and landfill gas management.

CityView Center

- Explosive levels of methane
- High levels of VOCs
- Urgent public health hazard
- Active gas extraction system



CityView Center, Garfield Heights, OH:

- Methane detected at 0-100% of the lower explosive limit (LEL) throughout the site
- Explosive levels of methane and high levels of VOCs detected in the walls of an on-site office building
- ATSDR determined that the site posed an urgent public health hazard, which was communicated in a letter from the ATSDR Director to the Director of Ohio EPA requesting immediate action to eliminate the existing health threat.
- The Ohio EPA ordered that an active gas extraction system be installed at the landfill, which began operating Spring, 2010.

Current Site-Mount Clemens Landfill

(Mt. Clemens, MI)



- Unregulated Landfill
- Elderly and low-income housing complexes
- Methane in subsurface soil
- Explosive methane levels detected
- Urgent public health hazard

Mount Clemens is a small city (~17,000) located in southeast Michigan in Macomb County.

•In the late 1970s-early 1980s, elderly and low-income housing complexes were built over and adjacent to an unregulated municipal landfill that had operated between 1940-1965. The two housing high-rises were constructed on and adjacent to landfill waste cells. The two complexes (Park Place Tower and Clinton Place Tower) are home to approximately 750 people.

•Methane in subsurface soil was first detected near the housing complexes in 1985.

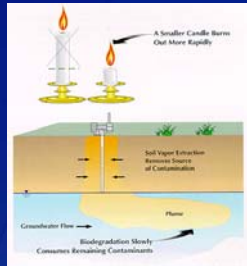
•Many methane samples collected on site to date have been within the explosive range (5-15% methane by volume), with levels up to 54% methane

•HUD was concerned that methane concentrations could pose a threat to residents living over and near the landfill and asked ATSDR to review available data and issue a health opinion.

• Given the frequency of detects in the months before ATSDR's review of existing data above the lower explosive limit, ATSDR classified site conditions as an "urgent public health hazard".

•ATSDR Director sent a letter to Director of the Michigan Dept. of Natural Resources and Environmental stating this conclusion and recommendation to address the issue of landfill gas migration below the buildings

Mount Clemens Landfill



Example of Passive Venting System



Example of Active Venting System

Since this is a municipal-owned landfill, the City of Mt. Clemens is responsible for remediating this problem. They are experiencing significant financial problems and have asked for USEPA assistance in maintaining the temporary ventilation system to reduce the methane levels below the buildings, while a long term remedy is being designed and implemented.

- A recent pilot study determined that converting the existing passive venting system to an active system was effective in a significant, but temporary, reduction in landfill gas levels below the building foundation
- The City of Mt. Clemens is working with USEPA and the state to identify a permanent remedy to eliminate the hazardous landfill gas problem for these housing complexes.

Vapor Intrusion: Hartford, IL



Vapor intrusion from buried pipelines impacted residences and soils:

- 40 million gallons of gasoline, diesel and unrefined products released from buried pipelines and from the surrounding refineries over a 40+ year period
- Since 1973, 49 documented releases (primarily gasoline) totaling approximately 325,000 gallons
- 1978-2002 – A total of 2 million gallons collected from product recovery wells and vapor recovery system
- Odor complaints began in 1966
- Illinois EPA has documented about 363 reported odor complaints through September 2004.
- Complaints more frequent after rain events and when the river is up

Vapor Intrusion: Hartford, IL June 2003 Health Assessment Conclusions

- The intrusion situation of May 2002 posed a public health hazard
- The vapor reduction measures in Hartford are not effective for all residents
- Division of Epidemiologic Studies did not find evidence in the State Cancer Registry of increased rates of leukemia in Hartford



Vapor Intrusion: Hartford, IL September 2005 Health Consultation

Health Consultation

QUARTERLY INDOOR AIR SAMPLING OF HARTFORD RESIDENCES

HARTFORD, MARISSON COUNTY, ILLINOIS

SEPTEMBER 5, 2005

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

- Long-term exposure to benzene and 1,3-butadiene in some homes in Hartford poses a public health hazard based on estimated increased cancer risk.
- Conditions still exist in Hartford where acute, high-level vapor intrusions may occur again, as they did in May 2002.



“Success stories” showing redevelopment to achieve a variety of health-related goals: preventing exposure to residual contamination, improving recreation/greenspace; improving access to quality, affordable housing; improving access to health care, improving community policing, and other services; improving access to education; revitalization of tribal lands; and new jobs and economic development to benefit the community. Each case study tells a story of how community health was successfully integrated into brownfields redevelopment and land reuse, highlighting key elements such as leadership, financing and other resources tapped, stakeholder involvement, actions taken, measures of success, and lessons learned.

Photos for redeveloped sites:

New residence at former Kenosha Brass site, WI

Community members cleaning Five Mile Creek, AL

Community members gardening in Cleveland, OH

Leading Change for Healthy Communities and Successful Land Reuse

Brass Site, Kenosha WI

The City engaged the community in redevelopment plans

Goals:

- Improved housing stock around the site
- Mixed use development with housing on the site
- New full service grocery store – closest grocery store was 15 blocks away
- Need for a middle school in the area



The Brass Site was a 29-acre urban brownfield, once home to the American Brass Company. The site had operated as a brass and copper foundry for over 100 years and employed as many as 3000 locals. The land was contaminated and areas near the site were known as the worst parts of town, littered with bars and with the heaviest crime activity. The factory ceased operation in 2000 and was vacant until the city began redevelopment in 2002.

Brass Site, Kenosha, WI



Outcomes:

- Crime calls decreased by 50%
- Property values increased overall by about 50%
- Ownership vs. rent increased
- Grocery store on site enables people access to full range of foods
- New school opened on site
- No gentrification occurred

Clearwater, FL

- Community involvement improved public health
- An Environmental Justice action agenda drove the redevelopment planning process



Redevelopment agenda was set, in a large part, by community residents. Public health was a priority from the beginning.

Clearwater, FL



Results:

- An abandoned gas station was redeveloped into a community health center
- A polluted creek was restored
- Blighted properties were redeveloped into new police and fire stations
- Access to recreation and open space was increased
- New jobs were created
- Access to affordable housing was provided

Five Mile Creek, Jefferson County, AL



- The creek, nicknamed “Creosote Creek”, is in reality 45 miles long and had a history of contamination from iron and steel manufacturing, coal mining, and coke production
- This blighted watershed is now recreational area, used for hiking, biking, running, horseback riding, canoeing/kayaking, throughout all seasons of the year.
- Strong community partnerships and the vision of the local fire chief led to greenways and an improved ecosystem and environment

Highland Park, Milwaukee, WI

- A run-down public housing project was redeveloped into affordable housing for seniors and disabled
- Amenities include a green roof, stormwater swales, cork and dyed concrete floors, indoor trees, and reuse of many materials, such as the floor of a former gym



East Cleveland, Cuyahoga County, OH

- Lack of access to nutritious food sources
- Limited number of safe and well maintained green spaces
- Lead poisoning
- Polluted watershed
- Vacant/abandoned properties
- Poor housing
- High crime rates
- Very little community knowledge about environmental health hazards



East Cleveland, Cuyahoga County, OH

- Environmental justice community
- 93 % African-American population
- In 2000, 31% of residents had not received a high school diploma
- Almost 90% of homes contain lead
- Heart disease rates are higher than the total for the county and nation
- In 2007, there were 1247 vacant properties, a shrinking city
- Only 2 square miles are dedicated for parks and green spaces.

ATSDR funded two community health projects, one at the city level, then another expanding the program to the county level, to address these issues.

Making a Difference Cuyahoga County Board of Health

Community Involvement

ATSDR Action Model

- Nutrition
- Physical activity
- Land and environment
- Safety



Community Gardens, Farmers' Markets

Youth Environmental Justice Education

Watershed Education

County-level Site Inventory Tool

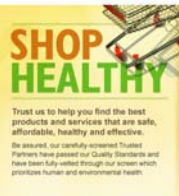


The Cuyahoga County Board of Health (CCBH) through a community health grant by ATSDR expanded on existing redevelopment and revitalization activities in East Cleveland focused on the priority areas outlined below. The East Cleveland - Action Model provided the framework for maintaining a collaborative, outcome driven process for monitoring health and social impacts in the community as the project moves into its next phase of implementation.

- Nutrition - increase food access through community gardens and improved access to the local farmers market
- Physical activity - increase access to play spaces through the creation of playgrounds and green spaces
- Land and environment - establish a coordinated system for the assessment of public health risk and monitoring of health impacts related to brownfield site assessment and redevelopment projects; adapt the ATSDR site assessment tool as a county-level site inventory tool which facilitates the integration of public health and allows data sharing among multiple county level partners; enhance and expand community and school-based youth environmental education; enhance watershed-based community education, advocacy and planning to support the establishment of a watershed action plan; increase health and land use education, community outreach and engagement.
- Safety - decrease vandalism, delinquency and crime through redevelopment activities

Is Green Chemistry Safer?

**Be Skeptical of
'Greenwashing' Claims**



The Best Green Cleaners What is this

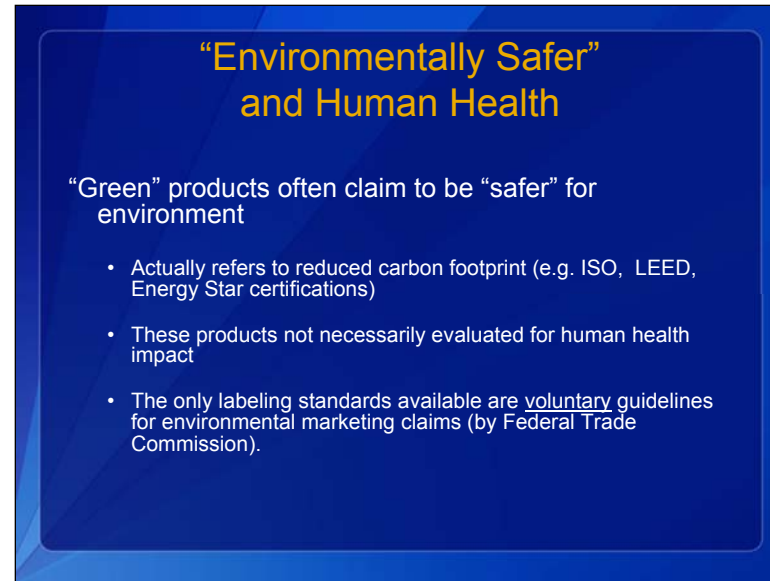
You care about the environment, but you also want clean laundry, shiny dishes, and a spotless kitchen. The GHRI's Home Appliances & Cleaning Products department put 23 green cleaners — nine laundry detergents, seven hand dishwashing liquids, and seven all-purpose cleaners — through rigorous tests, and found five winners, all of which get their cleaning power from plant-based ingredients.

Are Green Cleaning Products Really Safe?

Governor Rell Signs Bill Requiring Green Cleaning Products in Public Schools

As discussed by yesterday's plenary speaker, John Warner, when we utilize green chemistry design, less hazardous chemicals or processes are substituted for the existing approaches. The benefits are numerous; overall green chemistry is better for the environment and better for human health. However, caution should be taken when products or processes are marketed as "environmentally safe" or "green."

According to U.S. Environmental Protection Agency regulations, disinfectant products cannot make green claims because they contain registered pesticides. Some certified-green cleaning products can be used at higher strengths to disinfect. When used in this more concentrated form, green certification standards no longer apply to these products.



**“Environmentally Safer”
and Human Health**

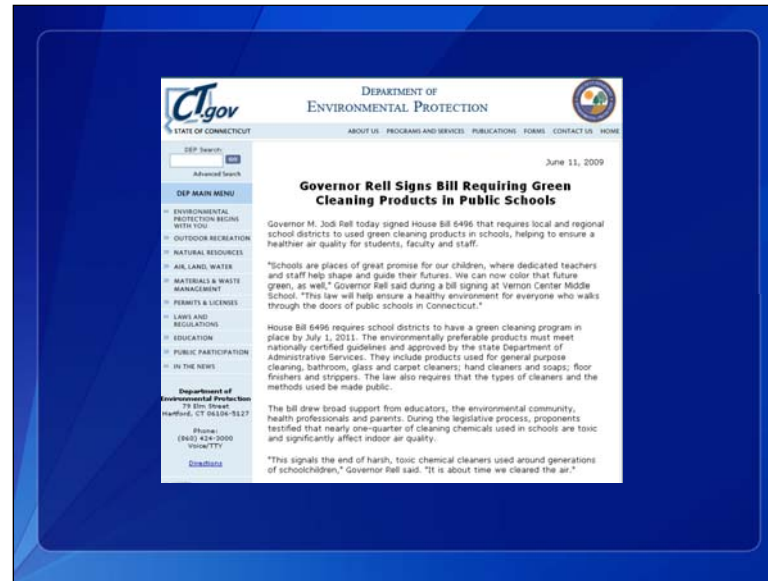
“Green” products often claim to be “safer” for environment

- Actually refers to reduced carbon footprint (e.g. ISO, LEED, Energy Star certifications)
- These products not necessarily evaluated for human health impact
- The only labeling standards available are voluntary guidelines for environmental marketing claims (by Federal Trade Commission).

Be Skeptical of 'Greenwashing' Claims

Many cleaners make extravagant claims of being environmentally-friendly, but often this marketing simply doesn't stand up to scrutiny. No regulations exist to require that manufacturers be honest with consumers.

Simple Green's label advertises "non-toxic" and "biodegradable", as its green attributes. Its principal cleaning ingredient, 2-butoxyethanol, is a possible human carcinogen (<http://www.epa.gov/iris/subst/0500.htm>), and is specifically prohibited in green cleaning supplies certified by Green Seal™ and EcoLogo™ .



News release: **Connecticut** Governor M. Jodi Rell has signed legislation that [requires local and regional school districts to use green cleaning products in schools](#). This will help to ensure a healthier air quality for students, faculty and staff.

School districts must have a green cleaning program in place by July 1, 2011. The environmentally preferable products must meet nationally certified guidelines and be approved by the state Department of Administrative Services. They include products used for general-purpose cleaning; bathroom, glass and carpet cleaners; hand cleaners and soaps; floor finishers and strippers.

In Conclusion: Safer or Not?

- Evaluate the evidence
- For formerly used sites, know former property uses and evaluate the risk associated with the residual contaminants
- For green products, have sound scientific evidence and evaluation to assure product safety

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