

# Public Health and Risk Communication for Brownfield Sites

Technical Assistance for Brownfields Program  
EPA Region 1

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**UCONN**  
HEALTH



# Risk Communication

## Welcome & Introduction

- ▶ Sara Wakai, PhD, Assistant Professor
  - UConn Health, Center for Population Health

## Acknowledgement - Technical Assistance of Brownfields Program

- ▶ Marisa Chrysochoou, PhD, Professor and Department Head
  - Civil and Environmental Engineering, UConn
  - Program Director, UConn Technical Assistance for Brownfields Program (TAB)  
Region 1 (New England States)
- ▶ Nefeli Bompoti, PhD, Assistant Research Professor
  - Civil and Environmental Engineering, UConn
  - Program Manager, UConn Technical Assistance for Brownfields Program (TAB)  
Region 1 (New England States)



# Presentation Objectives

- Definition of Risk Communication
- Seven Cardinal Rules of Risk Communication
- Case Study
- Examples and Resources



# Risk Communication Definition

“Risk communication is communication intended to supply audience members with the information they need to make informed, independent judgements about risks to health, safety, and the environment.”

Morgan MG., Fischhoff B., Bostrom A., Atman CJ. *Risk Communication: A Mental Models Approach*, 2002, Cambridge University Press.

Adopted by EPA in March 2021 as the definition of risk communication.



# Seven Cardinal Rules of Risk Communication

Dr. Vincent T. Covello and Dr. Frederick W. Allen (1988)  
US Environmental Protection Agency (US EPA)

- Adapted for current presentation

[https://archive.epa.gov/care/web/pdf/7\\_cardinal\\_rules.pdf](https://archive.epa.gov/care/web/pdf/7_cardinal_rules.pdf)

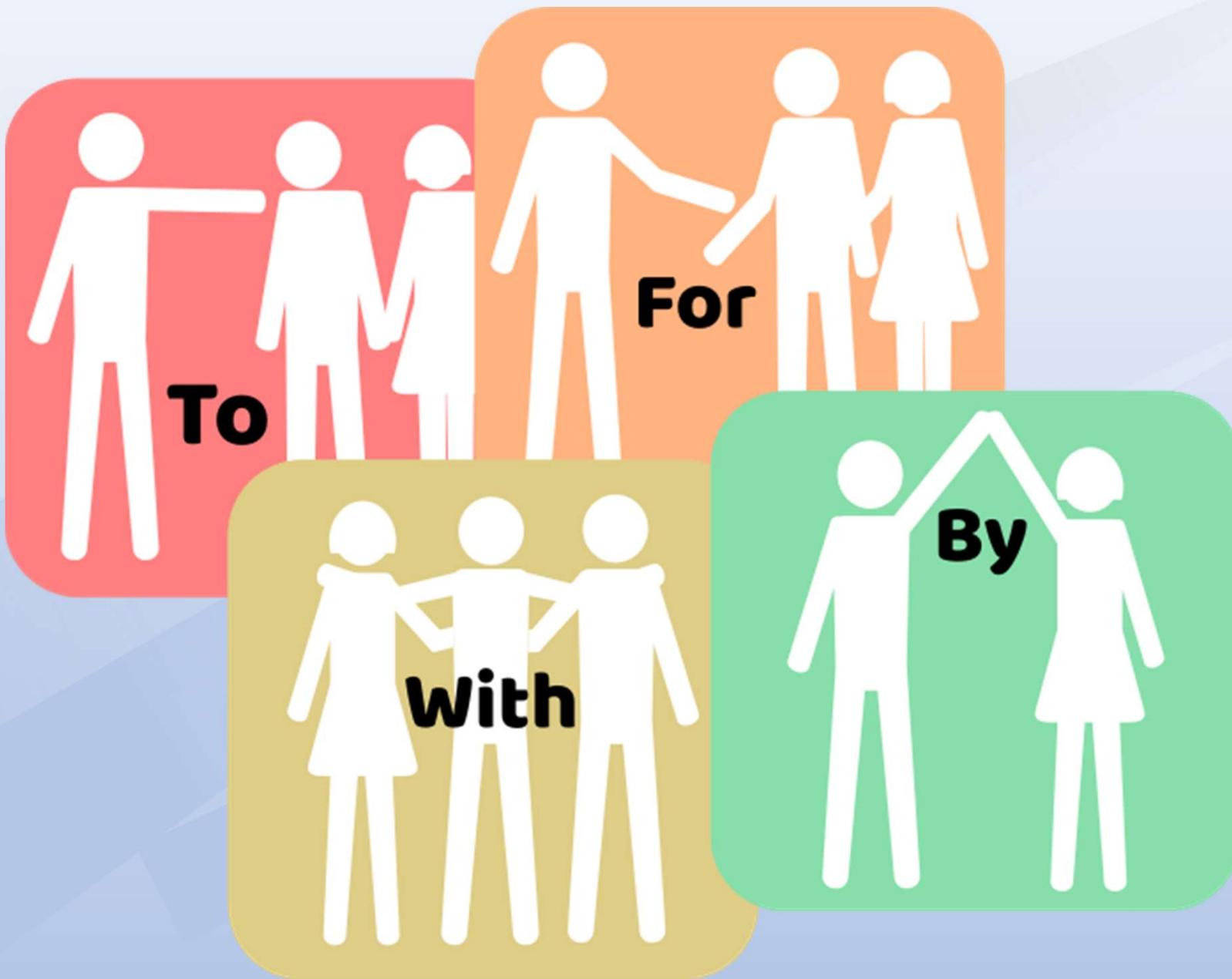


# Rule 1

## **Accept and Involve the Public as a Legitimate Partner**

- People and communities have a right to participate in decisions that affect their lives, their property, and the things they value.
- Involve the community early, before important decisions are made.





# Rule 2

## Plan Carefully and Evaluate Your Efforts

- Develop clear, explicit risk communication messages
- Pretest messages
- Train staff in communication skills



# Use Simple Messages

## Examples:

- Reduce, reuse, recycle
- Three tests before age three (for blood lead screening)
- Boil water advisory (BWA)
- Think Green
- Shop local
- Safety First

(Environmental Health Resources Self-Learning Module –Risk Communication, ATSDR)



# Rule 3

## Listen to the Public's Specific Concerns

- Learn what people:
  - Know
  - Think
  - Want to be done

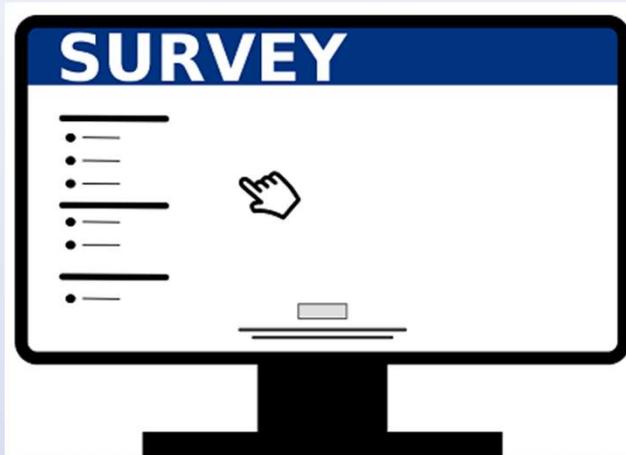


# Understand your Audience

- Demographics
  - ✓ Age - parents of young children, senior citizens
  - ✓ Cultural background, norms, values, language
  - ✓ Educational level
- Geographic location
  - ✓ Distance from brownfield site
- Additional stressors
  - ✓ Health issues
  - ✓ Financial burdens
  - ✓ Additive stressors



# Ways to Get to Know your Audience



Round Table Discussion

## Town Hall Meeting



Video Chat



# Listening Skills...some Dos and Don't's

## DO...

...become aware of your own listening habits

...share responsibility for the communication

...be physically attentive

...concentrate on what the speaker is saying

...try to get the total meaning, including feelings as well as information

...observe the non-verbal signals

...adopt an accepting attitude toward the speaker

...express empathetic understanding

...listen to yourself

...“close the loop” of listening by taking appropriate action. Actions speak louder than words.

## DON'T...

...mistake not talking for listening

...fake listening

...interrupt needlessly

...pass judgement too quickly

...make arguing an “ego-trip” by thinking about what you want to say next rather than hearing what is being said

...ask too many questions

...ever tell the speaker, “I know exactly how you feel”

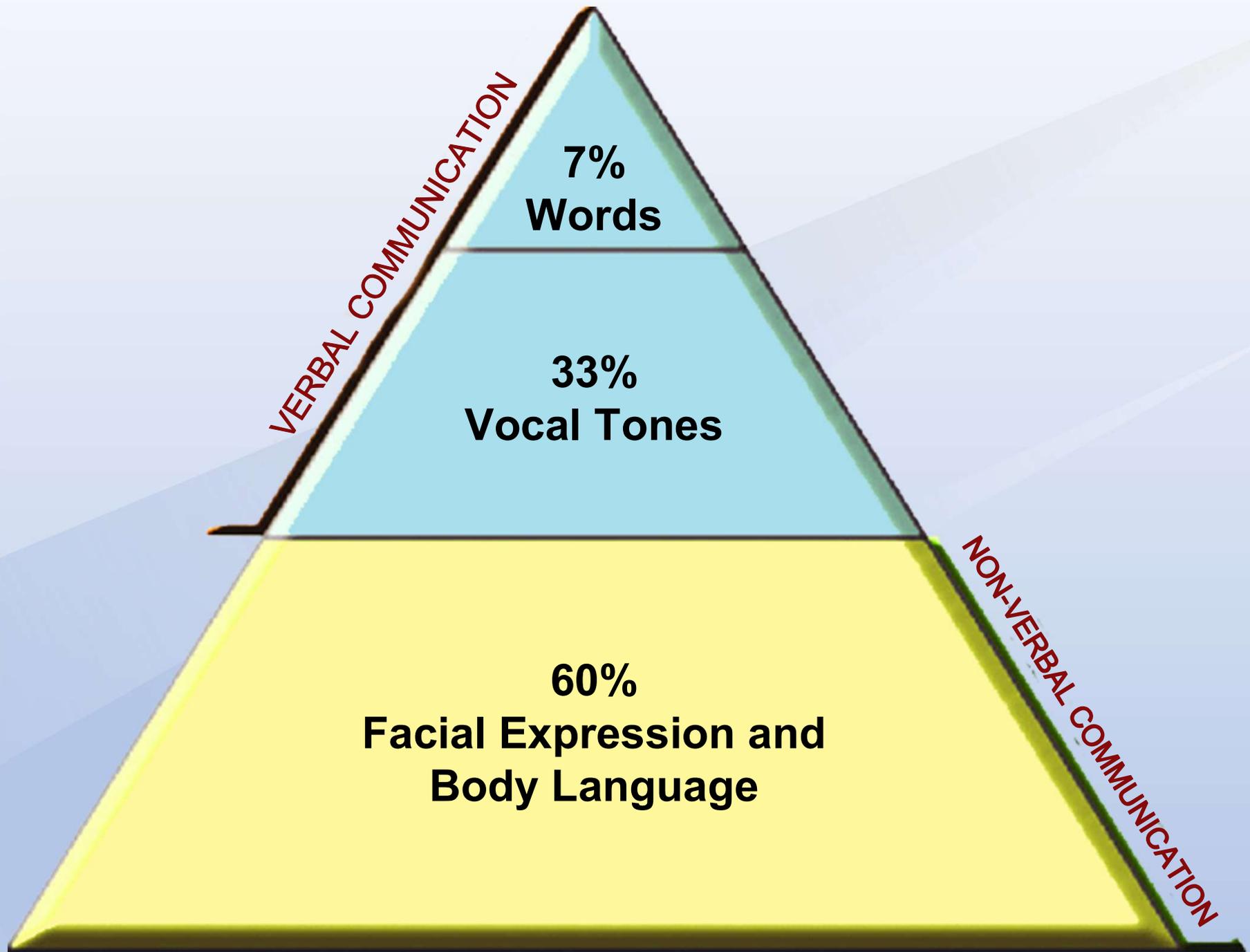
...over react to emotional words

...give advice unless it is requested

...use the appearance of listening as a way of hiding yourself by avoiding emotional involvement and real communication

EPA Source: “Some Dos and Don'ts of Listening”, from I Hear You, ©1986 Eastwood Atwater, Prentice Hall, Englewood Cliffs, NJ





# Risk Perception

Effective risk communication is based on an understanding that risk means different things to different people.

➤ Objective:

- Calculated by scientists based on research and facts

➤ Subjective:

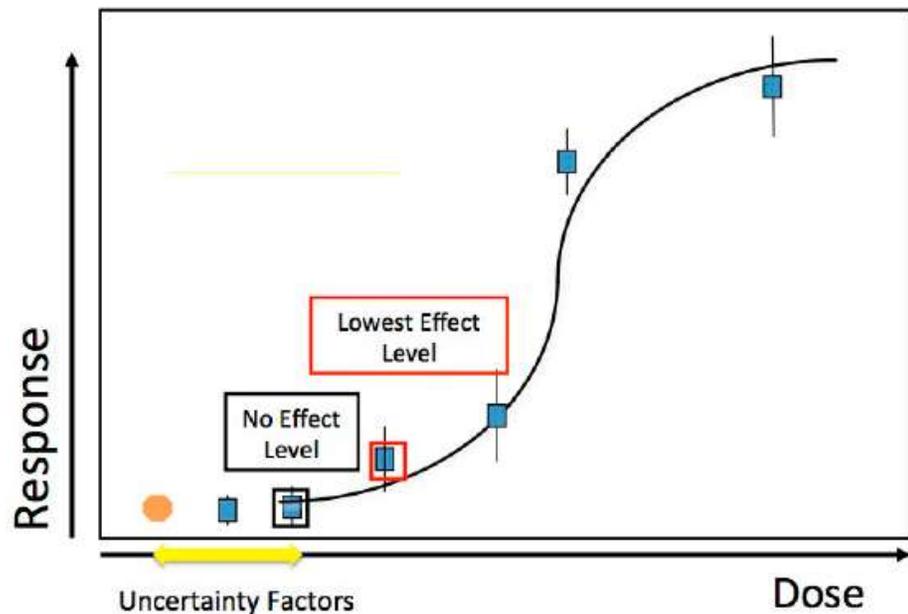
- Risk that the public perceives
  - ❖ May be increased or decreased by familiarity, dread, personal control



# Risk: Probability or Danger?

When professionals say “risk,” we’re thinking of “probability.”

When others hear “risk,” they may think “danger.”



Risk is understood at the individual level... will it hurt me or not?

Risk is measured at the population level ...percent of population impacted.

Source: Kaci Buhl, Associate Professor of Practice Assistant Director, National Pesticide Information Center  
Department of Environmental & Molecular Toxicology, Oregon State University



# Risk Perception

Reduces	Increases
In person's control	Out of person's control
Voluntary	Imposed
Beneficial	Not beneficial
Natural	Human-made
Affects only adults	Affects children
Familiar	Exotic
Trusted entity	Untrusted entity

Source: [https://pdf.usaid.gov/pdf\\_docs/PNADL657.pdf](https://pdf.usaid.gov/pdf_docs/PNADL657.pdf)



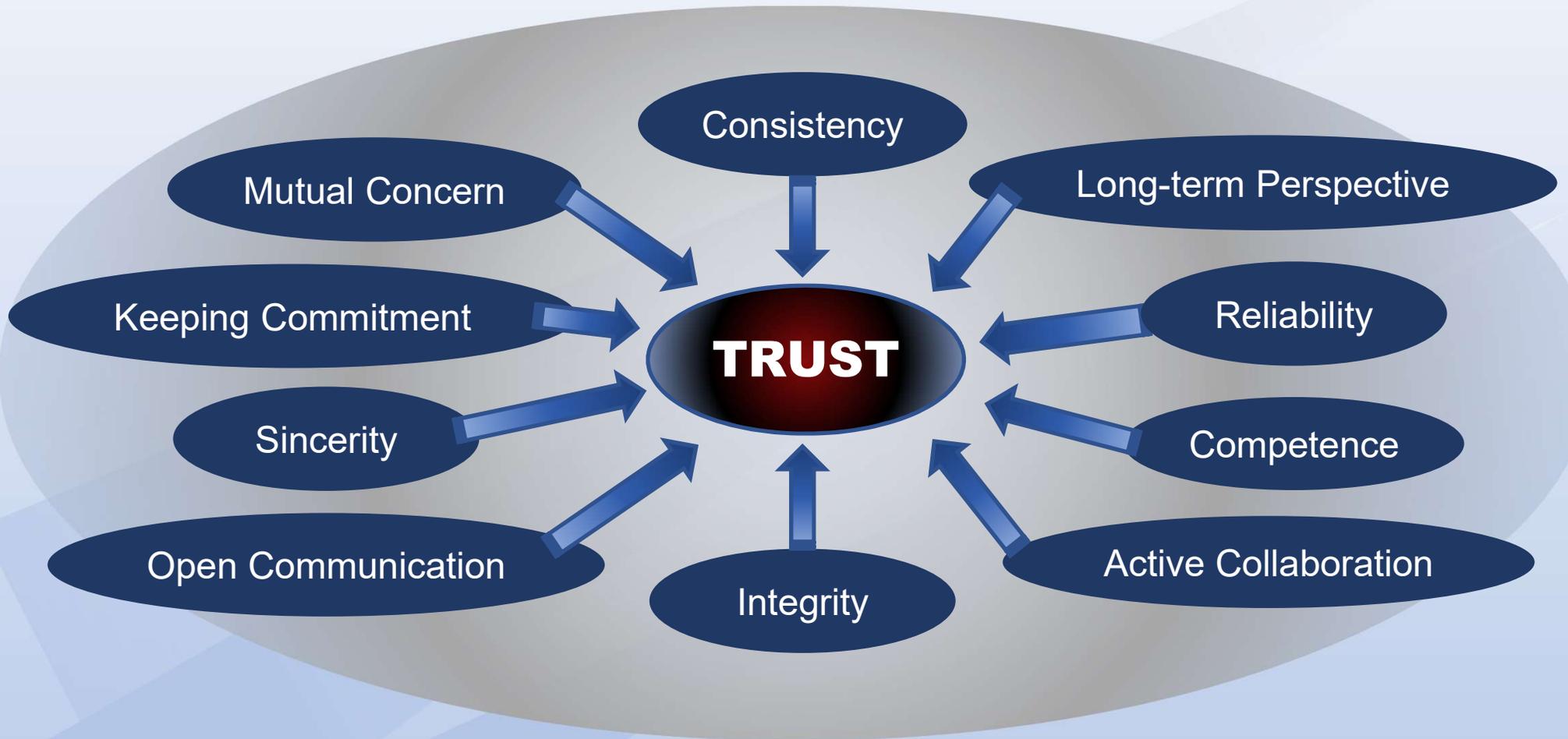
# Rule 4

## Be Honest, Frank, and Open

- Introduce yourself and share your credentials.
- Don't ask or expect to be trusted by the public.
- If you don't know the answer to a question, say so. Offer to find out the answer.
- Share risk information as soon as possible.



# Trust Diagram



<https://nepis.epa.gov/Exe/ZyPDF.cgi/9101O1DI.PDF?Dockey=9101O1DI.PDF>



# Rule 5

## Work With Other Credible Sources

- Determine who is best able to answer questions about risk by working with others.
- Develop partnerships, when applicable, with members of the community, organizations or governmental agencies.
- Issue joint communications with other trustworthy experts, such as university scientists, trusted local officials, Local Health Departments, citizen advisory groups, community leaders, clergy or medical professionals.



# Brownfields Success Story: Ferrous Site, Lawrence, MA, April 2020



*Courtesy of the City of Lawrence, Mass.*



# Rule 6

## Meet the Needs of the Media

The media are prime transmitters of information on risks to the public.

- Prepare a limited number of factual key messages tailored to the needs of each type of media.
- Try to anticipate their questions.
- Be open with and accessible to the media.
- Say only what you are willing to have repeated.



# Rule 7

## Speak Clearly and with Compassion

- Use simple language.
- Avoid technical terms or jargon.
- Be sensitive to local norms, such as speech and dress.
- Promise only what you can do, and do what you promise.



# Plain Writing Act of 2010

An act to enhance citizen access to government information and services by stating that government documents issued to the public must be written clearly so that users can:

- ✓ Find what they need
- ✓ Understand what they find
- ✓ Use what they find to meet their needs

**Plain language helps build trust.**

<https://www.plainlanguage.gov/guidelines/>



# Simplified Terminology Examples

**Disease:** sickness (more common); illness (less common);

**Plain Language Sentence:** Checking your body for cancer, even if you don't have symptoms, helps find sicknesses early when treatment often works best.

**Dose:** amount, number of times;

**Plain Language Sentence:** Some children 6 months through 8 years of age need the flu shot or nasal spray two times if they: \* Are getting vaccinated for the first time \* Have been vaccinated before

**Facilitate:** make a process easier, help, guide;

**Plain Language Sentences:** Mediators, or neutrals, help create a solution that everyone is willing to accept. People who lead groups not in the same physical place have different tools and skills to help the group do its work.

**Toxic, toxigenic:** poisonous

**Plain Language Sentence:** Some molds can create poisons, which can make you sick, but the molds themselves aren't poisonous.

**Surveillance:** collecting or gathering of information;

**Plain Language Sentence:** We gather information from places where people work so we can improve worker safety and health.

- <https://www.plainlanguage.gov/>
- <https://tools.cdc.gov/ewapi/termsearch.html>



# Risk Communication

## Creating a Message Map

### Case Study



# Steps to Creating a Message Map

Step 1. Identify stakeholders

Step 2. Identify anticipated stakeholder questions and concerns

Step 3. Identify frequent concerns

Step 4. Develop key messages

Step 5. Develop supporting information

Step 6. Conduct testing

Step 7. Overarching Message Map

Step 8. Delivery

<https://nepis.epa.gov/Exe/ZyPDF.cgi/60000IOS.PDF?Dockey=60000IOS.PDF> (page 24)



# Message Map Template

## Stakeholder question or concern:

Key Message 1 9 words on average	Key Message 2 9 words on average	Key Message 3 9 words on average
Supporting message 1a	Supporting message 2a	Supporting message 3a
Supporting message 1b	Supporting message 2b	Supporting message 3b
Supporting message 1c	Supporting message 2c	Supporting message 3c
Supporting message 1d	Supporting message 2d	Supporting message 3d

Message map source: Covello, 2007



# Environmental Health Resources Self Learning Module

## Risk Communication



Agency for Toxic Substances  
and Disease Registry  
Division of Community  
Health Investigations

[https://www.atsdr.cdc.gov/sites/brownfields/pdfs/risk\\_communications-508.pdf](https://www.atsdr.cdc.gov/sites/brownfields/pdfs/risk_communications-508.pdf)

CSZ7095-A



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# Case Study: My School Daycare East Hampton, CT



*Kenny Foscue, a Health Educator with the Connecticut State Department of Public Health shares this case study as an example of risk communication activities he routinely performs.*

[https://www.atsdr.cdc.gov/sites/brownfields/pdfs/risk\\_communications-508.pdf](https://www.atsdr.cdc.gov/sites/brownfields/pdfs/risk_communications-508.pdf)



# Day Care Center Message Map

## 1. Key Message

Connecticut Department of Public Health has worked with the owner and operator to ensure arsenic in the soil will be covered with wood chips to prevent exposures

## 2. Key Message

Children attending the daycare will not have direct contact with the residual arsenic contamination in the soil

## 3. Key Message

Children were not likely exposed as the daycare center has been open less than a year and during winter children were not using the playground

## 4. Key Message

The lack of contact with the soil means children will not be exposed to the arsenic in the soil

### Supporting information 1.1

Limited soil removal will take place in areas with highest arsenic levels

### Supporting information 2.1

The playground has a layer of woodchips covering the soil

### Supporting information 3.1

A child would need to play directly in the soil on a daily basis for several years to be harmed by arsenic

### Supporting information 4.1

### Supporting information 1.2

Cleanup plan will likely include placing additional layers across the entire playground

### Supporting information 2.2

Owner plans to add additional layers of covering such as heavy landscaping fabric, crushed limestone, and woodchips

### Supporting information 3.2

### Supporting information 4.2

### Supporting information 1.3

After additional layers added, children will not be able to come into contact with the soil

### Supporting information 2.3

One would need to play directly in the soil on a daily basis, for several years to be harmed by arsenic

### Supporting information 3.3

### Supporting information 4.3

# Examples and Resources





Lecture



Meetings



One-on-One



Website



Webinars



Billboards



Email & Text Messages



TV / Radio



Social Media



Podcasts



US Mail



Print Media



Public Notices / Flyers



Videos



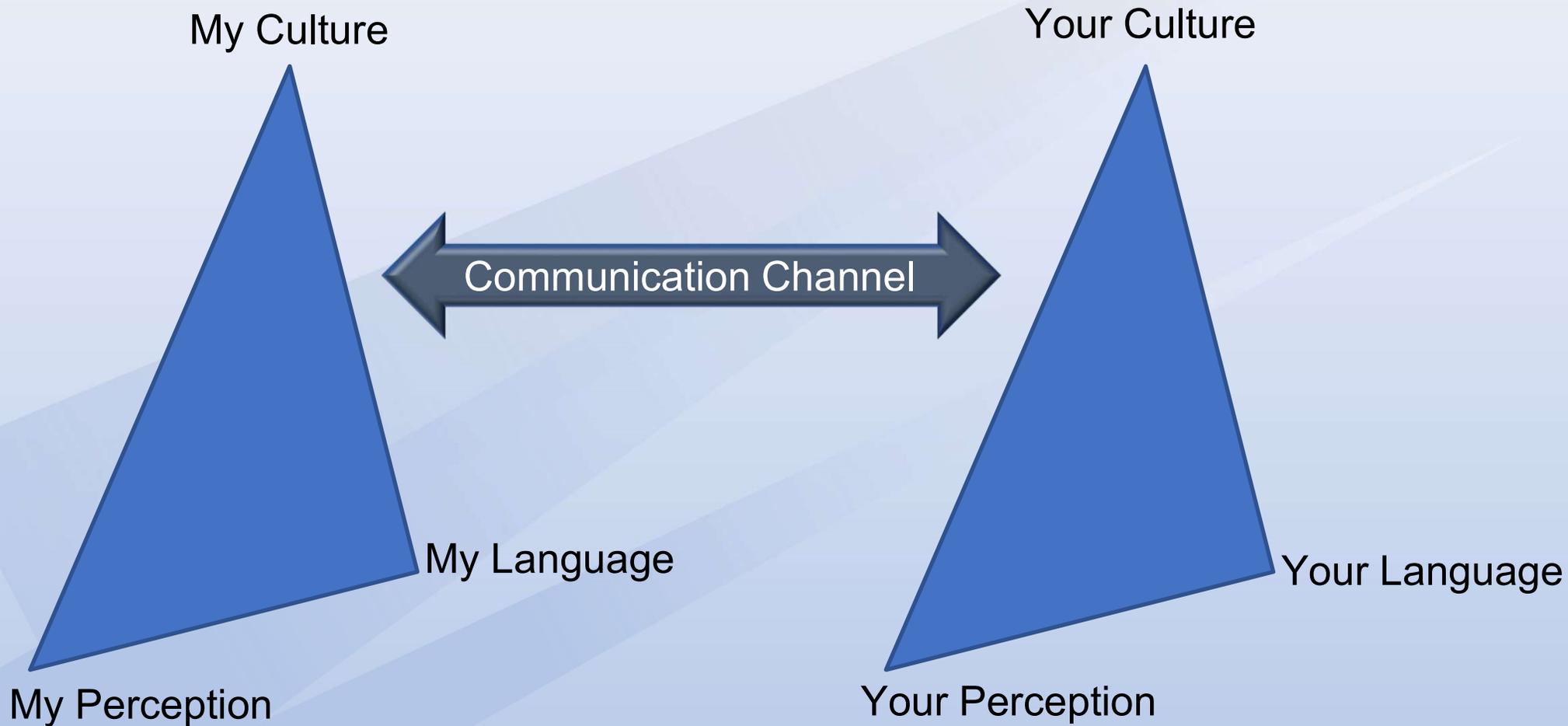
Mobile apps



Comics

Source:  
Kaci Buhl, Associate Professor of Practice Assistant Director, National Pesticide Information Center Department of Environmental & Molecular Toxicology  
Oregon State University

# The Communication Triangle



# Example of a Billboard

Promoting anti-litter initiative through EPA's Trash-free waters grant in Mobile, AL



**DON'T FEED THE FISH.**  
Do your part for trash-free waters.

**#CanItYall**

This project was supported by Grant No. MX-01D08020-0 awarded to the City of Mobile by the U.S. Environmental Protection Agency. The points of view or opinions in this document are those of the author and do not necessarily represent the official position or policies of the U.S. Environmental Protection Agency. EPA does not endorse any products or commercial services mentioned in this publication.



<https://www.mobilebaykeeper.org/trashfreewaters>



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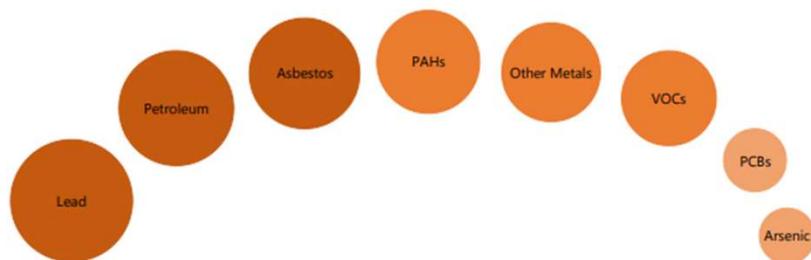
# Example of Factsheet

## Environmental Contaminants Often Found at Brownfield Sites

Brownfield properties are often overlooked for reuse or redevelopment due to fear of environmental contamination. Understanding the **types of contaminants present** (or potentially present) and **how people may be exposed to those contaminants** will help a community plan cleanup and site reuse options that limit exposure risk.

U.S. EPA, states and tribes have programs that can help communities identify properties that are brownfields, determine whether the property is environmentally-contaminated, address contamination when needed and plan for site reuse that will bring new benefits to the community.

Below are the contaminants most commonly reported from brownfields cleaned up using U.S. EPA grant funds. Each circle's size reflects how often the contaminant was reported to the U.S. EPA.<sup>1</sup>



Contaminant	Substance Type	Examples of Past Uses
1. Lead (Pb)	Metals	Mining, fuel, paint, inks, piping, batteries, ammunition
2. Petroleum	Oil, hydrocarbon compounds	Drill and refining, fuel, chemical and plastic production
3. Asbestos	Fiber in rock	Mining and processing, piping, insulation, fire proofing, brakes
4. Polycyclic aromatic hydrocarbons (PAHs)	Hydrocarbon compounds, combustion byproduct	Coal tar, creosote, soot, fire, industry/ manufacturing byproduct
5. Other metals	Metals	Metal fabrication, plating, mining, industry/ manufacturing
6. Volatile organic compounds (VOCs)	Manmade chemicals	Industry and commercial product solvents, degreasers, paint strippers, dry cleaning
7. Polychlorinated Biphenyls (PCBs)	Manmade chemicals	Heat and electrical transfer fluids, lubricants, paint and caulk, manufacturing, power plant
8. Arsenic (As)	Metals	Pesticides, agriculture, manufacturing, wood preservative

Contaminants can cause a range of health effects when a person is exposed, and the contaminant is absorbed into the body. Exposure pathways refer to the ways people come into contact or are exposed to a contaminant. The extent of exposure and absorption depends on how much contaminant is present, how a person is exposed, how often and how long they are exposed. Sensitive populations may be at a greater risk from exposures, such as children, the elderly and those with chronic conditions.

The three basic exposure pathways are (1) breathing, (2) eating or drinking, and (3) direct contact with the skin. Of the three, breathing and eating or drinking are the most common but all three can occur.



When contaminants attach to small dust and soil particles or occur as a vapor, **breathing** can expose people.



Exposure can occur when people **eat or drink** contaminated water, food, dusts or soils. Children that suck their fingers or chew toys contaminated with dust or soils may be exposed.



Skin can absorb some forms of contaminants from **direct contact** with contaminated dust and soil particles, the contaminants or vapors.

Contaminant	Potential Health Effects
1. Lead (Pb)	Damage to brain, nerves, organs, and bone; cancer
2. Petroleum	Headache; nervous system, immune, liver, kidney, and respiratory damage; cancer
3. Asbestos	Lung scarring, mesothelioma and lung cancer
4. Polycyclic aromatic hydrocarbons (PAHs)	Liver disorders; cancer
5. Other metals <sup>2-5</sup>	Immune, cardiovascular, developmental, gastrointestinal, neurological, reproductive, respiratory and kidney damage; cancer
6. Volatile organic compounds (VOCs)	Eye irritation; nausea; liver, kidney and nervous system damage; birth defects; cancer
7. Polychlorinated Biphenyls (PCBs)	Disruption or damage to the immune, hormone and neurological system; liver and skin disease
8. Arsenic (As)	Nausea, vomiting and stomach pain; blood disorders; nerve damage; skin disease; lung and skin cancer

<sup>1</sup>U.S. EPA grant recipients are required to report the presence of contaminants found and cleaned up through U.S. EPA's Assessment, Cleanup and Redevelopment Exchange System (ACRES). The following information is based on grant recipient reported cleanups completed at 1,417 sites from 2006-2018. This data is publicly available at [www.epa.gov/cleanups/cleanups-my-community](https://www.epa.gov/cleanups/cleanups-my-community)

<sup>2</sup>Other metals category includes a range of metals not limited to the heavy metals listed below

<sup>3</sup>Cadmium, Integrated Risk Information System, U.S. Environmental Protection Agency. [https://cfpub.epa.gov/icrres/risc2/chemical/landing.cfm?substance\\_nmbr=141](https://cfpub.epa.gov/icrres/risc2/chemical/landing.cfm?substance_nmbr=141)

<sup>4</sup>Chromium Compounds, U.S. Environmental Protection Agency. <https://www.epa.gov/sites/production/files/2016-09/documents/chromium-compounds.pdf>

<sup>5</sup>Mercury, U.S. Environmental Protection Agency. <https://www.epa.gov/mercury>

<https://www.epa.gov/brownfields/understanding-brownfields>



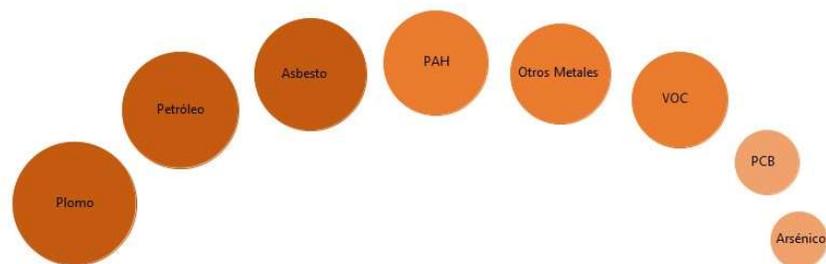
# Examples of Factsheets

## Contaminantes Ambientales que se Encuentran a Menudo en Sitios Brownfield

Las propiedades brownfield a menudo son pasadas por alto en cuanto a la reutilización o reurbanización debido a temores de que haya contaminación ambiental. Entender los tipos de contaminantes presentes (o potencialmente presentes) y cómo la gente puede ser expuesta a esos contaminantes ayuda a una comunidad a planificar opciones de limpieza y reutilización de sitios que limiten la exposición a riesgos.

La EPA, los estados y las tribus tienen programas que pueden ayudar a las comunidades a identificar propiedades que son brownfields, determinar si la propiedad está contaminada, abordar la contaminación cuando sea necesario y planificar la reutilización del sitio, que aportará nuevos beneficios a la comunidad.

En la tabla y la gráfica a continuación, se encuentran los contaminantes que se reportan con mayor frecuencia en los brownfields limpiados utilizando los fondos de subvenciones de la EPA. El tamaño de cada círculo refleja con qué frecuencia se reportó el contaminante a la EPA.<sup>1</sup>



Contaminante	Tipo de Sustancia	Ejemplos de Usos Pasados
1. Plomo (Pb)	Metales	Minería, combustibles; pinturas, tintas, tuberías, baterías, munición
2. Petróleo	Petróleo, compuestos de hidrocarburos	Perforación y refinación, producción de combustibles, agentes químicos y plásticos
3. Asbesto	Fibra en la roca	Minería procesamiento, tuberías, aislamiento, tratamiento contra incendios, frenos
4. Hidrocarburos aromáticos policíclicos (PAH, por sus siglas en inglés)	Compuestos de hidrocarburos, subproductos de la combustión	Alquitrán de carbón, creosota, hollín, incendios, subproducto de la industria/manufactura
5. Otros metales	Metales	Fabricación de metal, chapado, minería, industria/manufactura
6. Compuestos orgánicos volátiles (VOC, por sus siglas en inglés)	Agentes químicos artificiales	Solventes de productos industriales y comerciales, desgrasadores, removedores de pintura, tintorerías
7. Bifenilos policlorados (PCB, por sus siglas en inglés)	Agentes químicos artificiales	Fluidos de transferencia térmica y eléctrica, lubricantes, pinturas y masillas selladoras
8. Arsénico (As)	Metales	Pesticidas, agricultura, manufactura, preservante de maderas

Los contaminantes pueden causar una serie de efectos a la salud cuando una persona está expuesta y el contaminante se absorbe en el cuerpo. Las vías de exposición se refieren a las maneras en que la gente entra en contacto o se expone a un contaminante. El grado de la exposición y la absorción depende de cuánto contaminante esté presente, la manera en que una persona está expuesta, con qué frecuencia y por cuánto tiempo la persona está expuesta. Las poblaciones sensibles pueden correr mayor riesgo ante la exposición, como los niños, los adultos mayores y personas con afecciones crónicas.

Las tres vías básicas de exposición son (1) respirar, (2) comer o beber y (3) entrar en contacto directo con la piel. De las tres, respirar y comer o beber son las más comunes, pero pueden ocurrir las tres.



Quando los contaminantes se adhieren a pequeñas partículas de polvo y tierra o cuando están presentes en forma de vapor, respirar puede exponer a la gente.



La exposición puede ocurrir cuando la gente come o bebe agua contaminada, alimentos, polvo o tierra. Los niños que se chupan los dedos o mastican juguetes con polvo o tierra pueden verse expuestos.



La piel puede absorber algunas formas de contaminantes por el contacto directo con partículas de polvo y tierra contaminadas, los contaminantes o vapores.

### Contaminante

#### 1. Plomo (Pb)

Daño al cerebro, los nervios, órganos y huesos; cáncer

#### 2. Petróleo

Dolor de cabeza; daño al sistema nervioso, inmunitario, hígado, riñón y respiratorio; cáncer

#### 3. Asbesto

Cicatrices pulmonares, mesotelioma y cáncer del pulmón

#### 4. Hidrocarburos aromáticos policíclicos (PAH)

Trastornos del hígado; cáncer

#### 5. Otros metales 2-5

Daño al sistema inmunitario, cardiovascular, del desarrollo, gastrointestinal, neurológico, reproductivo, respiratorio y renal; cáncer

#### 6. Compuestos orgánicos volátiles (VOC)

Irritación ocular; náuseas; daño al hígado; riñón y sistema nervioso; defectos congénitos; cáncer

#### 7. Bifenilos policlorados (PCB)

Perturbación o daño al sistema inmunitario, hormonal y neurológico, enfermedad del hígado y la piel

#### 8. Arsénico (As)

Náuseas, vómitos y dolor de estómago; trastornos sanguíneos; daño al sistema nervioso; enfermedad de la piel; cáncer del pulmón y la piel

<sup>1</sup> A los beneficiarios de la subvención de la EPA se les exige reportar la presencia de contaminantes que se encuentren y limpien a través del Sistema de evaluación, limpieza e intercambio para reurbanización de la EPA (ACRES). La siguiente información se basa en 6,350 limpiezas reportadas por beneficiarios de subvenciones desde 2006 hasta 2018. Estos datos están disponibles para el público en [www.epa.gov/ehp/ehp/ehp/ehp-community](http://www.epa.gov/ehp/ehp/ehp/ehp-community)

<sup>2</sup> La categoría de otros metales incluye una serie de metales sin limitarse a los metales pesados indicados a continuación

<sup>3</sup> Cadmio, Sistema integrado de información de riesgo, Agencia de Protección Ambiental de EE.UU. [https://cfpub.epa.gov/nrcra/ris2/chemical/landing.cfm?substance\\_nmbr=141](https://cfpub.epa.gov/nrcra/ris2/chemical/landing.cfm?substance_nmbr=141)

<sup>4</sup> Compuestos de cromo, Agencia de Protección Ambiental de EE.UU. <https://www.epa.gov/sites/production/files/2016-09/documents/chromiim-compounds.pdf>

<sup>5</sup> Mercurio, Agencia de Protección Ambiental de EE.UU. <https://www.epa.gov/mercury>



EPA 560F19007  
Septiembre 2019

[https://www.epa.gov/sites/default/files/2020-01/documents/environmental\\_contaminants\\_often\\_found\\_at\\_brownfield\\_sites\\_spanish\\_508.pdf](https://www.epa.gov/sites/default/files/2020-01/documents/environmental_contaminants_often_found_at_brownfield_sites_spanish_508.pdf)

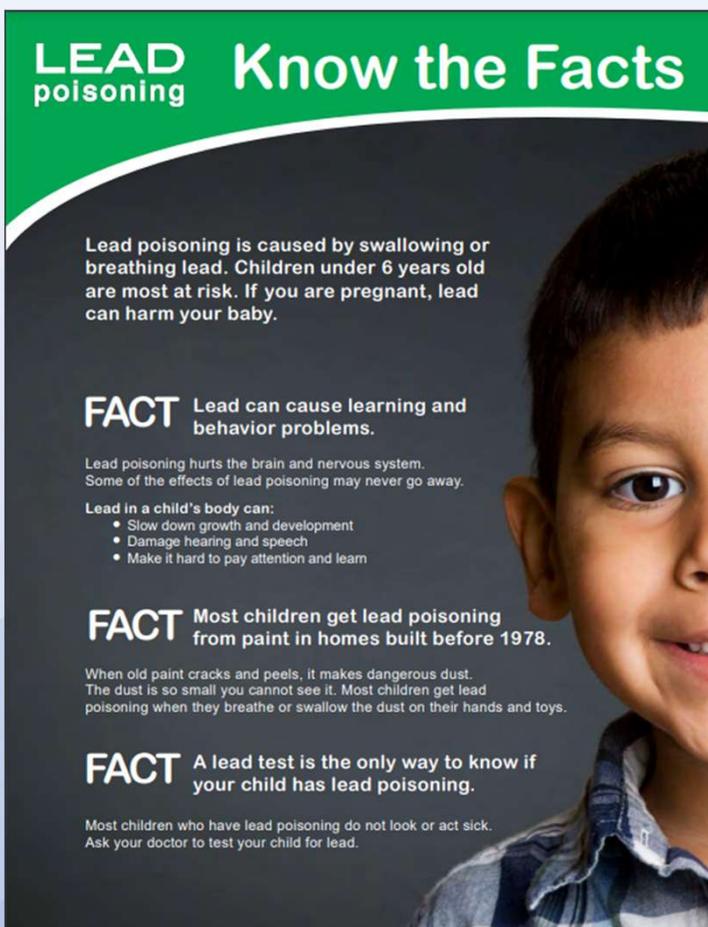


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# Example of Factsheet



**LEAD poisoning Know the Facts**

Lead poisoning is caused by swallowing or breathing lead. Children under 6 years old are most at risk. If you are pregnant, lead can harm your baby.

**FACT** Lead can cause learning and behavior problems.

Lead poisoning hurts the brain and nervous system. Some of the effects of lead poisoning may never go away.

Lead in a child's body can:

- Slow down growth and development
- Damage hearing and speech
- Make it hard to pay attention and learn

**FACT** Most children get lead poisoning from paint in homes built before 1978.

When old paint cracks and peels, it makes dangerous dust. The dust is so small you cannot see it. Most children get lead poisoning when they breathe or swallow the dust on their hands and toys.

**FACT** A lead test is the only way to know if your child has lead poisoning.

Most children who have lead poisoning do not look or act sick. Ask your doctor to test your child for lead.



**Protect Your Family**

**1. Test your home for lead.**

- If you live in a home built before 1978, have your home inspected by a licensed lead inspector.
- Contact your local health department for more information.

Sometimes lead comes from things other than paint in your home, such as:

- Candy, toys, glazed pottery, and folk medicine made in other countries
- Work like auto refinishing, construction, and plumbing
- Soil and tap water

**2. Keep children away from lead paint and dust.**

- Use wet paper towels to clean up lead dust. Be sure to clean around windows, play areas, and floors.
- Wash hands and toys often, especially before eating and sleeping. Use soap and water.
- Use contact paper or duct tape to cover chipping or peeling paint.

**3. Renovate safely.**

Home repairs like sanding or scraping paint can make dangerous dust.

- Keep children and pregnant women away from the work area.
- Make sure you and/or any workers are trained in lead-safe work practices.
- Home repairs like sanding or scraping paint can make dangerous dust.

Contact us for more information:



[https://www.cdc.gov/nceh/lead/docs/Know\\_the\\_Facts.pdf](https://www.cdc.gov/nceh/lead/docs/Know_the_Facts.pdf)



# Example of Factsheet

## How to Prevent Lead Poisoning in Children

Accessible Version: <https://www.cdc.gov/lead/docs/how-to-prevent-lead-poisoning-in-children.html>

There is no safe blood lead level in children. Even low levels of lead in blood can hurt a child's ability to learn, pay attention, and do well in school.

The good news is that childhood lead poisoning is preventable. Learn about common sources of lead and steps to reduce your child's risk of lead exposure.

### Know the common sources of lead

Lead can be found where children live, play, and learn.



**Paint.** In homes or buildings built before 1978, assume that the paint contains lead unless tests show otherwise. When the paint peels and cracks, it makes lead paint chips and dust. Children can be exposed to lead if they eat flaking paint chips or breathe in lead dust.



**Soil.** Lead particles from exterior lead-based paint, leaded gasoline, aviation fuel and lead industries can settle in soil and last for years. Children can be exposed to lead in soil by swallowing or breathing in lead-contaminated soil while playing. This soil can also get on shoes and clothes and be brought into the home or other locations where children spend time.



**Water.** Some water pipes, faucets, and plumbing fixtures may contain lead that can get into drinking water.



**Consumer products.** Lead can be found in toys, jewelry, antiques, and collectible items. Some glazes used on ceramics, china, and porcelain also contain lead, which might get into food.



**Imported foods and medicines.** Some candies, candy wrappers, spices, cosmetics, traditional medicines, and ceremonial or religious powders purchased or brought from outside the US contain lead.



**Jobs and hobbies.** Certain jobs and hobbies, such as stained-glass work, involve lead-based products and might result in parents or caregivers bringing lead into the home.



More information about the sources of lead can be found at <https://www.cdc.gov/nceh/lead/prevention/sources.htm>.

CS134029-C 03/22/2022

## Take steps to prevent lead exposure

There are many things you can do to protect your family from lead exposure.



### Make your home lead-safe

- **Check your home.** If you live in a home built before 1978, have your home checked by a licensed lead inspector. Find a certified inspector or risk assessor at <https://www.epa.gov/lead>.
- **Check your drinking water.** Contact your water provider to find out if you have a lead service line connected to your home. If there is lead in your tap water, take steps to reduce or eliminate exposure. More information can be found at <https://www.cdc.gov/nceh/lead/prevention/sources/water.htm>.
- **Renovate safely.** Home repairs and renovations, such as sanding or scraping paint in homes built before 1978, can release lead dust. If you are planning renovations, use only approved methods for removing lead hazards from your home and use contractors certified by the Environmental Protection Agency. More information can be found at [www.epa.gov/lead](http://www.epa.gov/lead).



### Make sure your products do not contain lead

- **Avoid certain children's products and toys.** Some toys, especially imported toys, antique toys, and toy jewelry may contain lead. You can find photos and descriptions of currently recalled toys at [www.cpsc.gov/recalls](http://www.cpsc.gov/recalls).
- **Be safe in the kitchen.** Some imported or antique ceramics and pottery dishes are glazed with lead. This glaze might contaminate food when stored or prepared in these dishes.
- **Avoid certain traditional medicines and cosmetics.** Avoid using traditional medicines (such as azarcon, greta, and pay-loo-ah) and cosmetics (such as kohl and sindoor) that contain lead. If you are not sure if a product contains lead, do not allow your child to use it.
- **Use caution when eating certain foods.** Avoid eating spices, candies, and other foods that were purchased abroad from informal or unregulated sources. Foods that were produced following proper licensing and regulations are more likely to be safe for children.



### Take everyday steps to stay healthy

- **Give your child healthy foods.** A balanced diet with foods that provide calcium, iron, and vitamin C may help keep lead out of the body. Many of these foods can be bought with food vouchers from food assistance programs. To learn more, call your child's pediatrician or visit [www.fns.usda.gov/wic](http://www.fns.usda.gov/wic).
- **Wash hands and toys.** Make sure your child washes his or her hands and face after playing outside or with pets that might have lead particles from soil on their fur or paws. Regularly wash children's toys, which might become contaminated from lead in soil or household dust.
- **Remove all shoes when you enter the house.** Take your shoes off when you enter the house to prevent spreading lead-contaminated dust through the home.
- **Be safe when working with lead.** If you or someone who lives with you works with lead, have them change into clean clothing before coming home. Keep their work or activity shoes and tools outside and wash their clothes separately from the rest of the family's clothes.

## Get your child tested for lead exposure

Talk to your healthcare provider about getting a blood lead test for your child. A blood test is the best way to determine if a child has been exposed to lead. Based on blood lead test results, healthcare providers can recommend follow-up actions and care.

For more information, visit <https://www.cdc.gov/nceh/lead/prevention/blood-lead-levels.htm>

[https://www.cdc.gov/nceh/lead/docs/Know\\_the\\_Facts.pdf](https://www.cdc.gov/nceh/lead/docs/Know_the_Facts.pdf)



# Example of Factsheet

## Cleaning Up Brownfield Sites

Unsafe levels of environmental contamination on a brownfield may result from past or current industrial, commercial, residential, agricultural or recreational uses and practices. Contaminants may be found in soil, water or air. Cleaning up contaminants on a brownfield reduces or eliminates potential health risks to residents, workers, pets and the surrounding environment. How much cleanup is needed depends on the specific contaminants found at the brownfield, the extent of contamination, and how the property will be reused.

**Risk levels.** States and tribes use a [risk-based cleanup](#) approach to determine the required level of cleanup necessary at brownfield properties. These levels are set to pose minimal risk to human health and the environment, in accordance with federal standards. States and tribes require cleanup to meet risk-based standards based on contaminants present and the planned reuse for the brownfield.

**Planned reuse for the brownfield.** The amount of cleanup required at a brownfield depends on how the site will be reused. The risk of future exposure to contaminants may be greater for residents and workers who will spend much of their time living or working there. Children, elderly, pregnant women and occupants who are ill can be especially sensitive to contaminants. The risk-based cleanup will consider sensitivities of the specific populations and their time spent on the property.



An effective brownfields cleanup protects the population from potentially harmful exposures by **removing or containing** site contaminants. For example:

- A residential site, where children may play or elderly live, requires a cleanup that **removes** contaminants above residential risk levels, so the property poses minimal risk from contaminant exposure.
- A factory with legacy contaminants associated with past uses may require cleanup in specific areas of the site to **remove** contaminants where workers could be exposed to levels above industrial standards. In low-access areas, such as power generation or vehicle storage, residual contaminants may be **contained**.

## How can my community clean up a brownfield site?

Identify the planned reuse for the site and seek out experts who can help you navigate the cleanup process.

- Through experience, U. S. EPA, state and tribal cleanup programs have learned a great deal about cleanup and contaminated site reuse. [State and tribal programs](#) oversee cleanups to ensure safe reuse standards are met.
- Cleaning up a brownfield requires assistance from an environmental professional to create a site cleanup plan based on assessment findings and to conduct the cleanup according to state, tribal and local requirements.

The specific approach used to clean up a site depends on the way the site will be reused. Site reuse will dictate the need for clean soil; geotextile or cover/cap; land use controls; and whether lead or asbestos abatement is required. Various technologies are available to clean up contaminated properties. The technology selected will largely depend on cost and contamination characteristics of the site. The following are some of the commonly-used methods for cleaning up brownfields and other contaminated sites.



**Excavation.** Contaminants and contaminated soil on the surface or subsurface are dug up from the site and transported offsite for treatment or disposal in a landfill. Clean soil or other material can be used to fill the excavated area and create a level surface for reuse.



**Tank removal.** Soil contaminated with gasoline or other fuels is dug up from the site to expose and remove the underground storage tanks and piping system. Then the soils under the tank can be examined for contamination and removed as needed.



**Capping.** Creating or adding a barrier between the surface and contaminants by using a geotextile, a layer of clean soil or both. Capping protects areas of cleanup, reduces exposures and prevents the spread of contamination.



**On site or 'In-situ' treatment.** Chemicals are injected into the soil to break down contaminants or convert them into less harmful or toxic substances. Solidification or stabilization adds binding or chemical agents to prevent contaminant movement.



**Bioremediation.** Naturally-occurring or adapted microbes consume organic contaminants. Active management at bioremediation sites includes adding nutrients, oxygen or chemicals that release oxygen to increase microbial growth, allowing them to degrade the contaminants over time to water, gas or less harmful or toxic substances.



**Phytoremediation.** Plant root systems release substances which help plants neutralize, stabilize or increase microbial degradation of contaminants in contaminated soil or water near roots. Select plants can also take up contaminants through their roots, reducing soil and water contamination over time.



**Lead and asbestos abatement.** Lead and asbestos are inspected and removed by specially-trained licensed contractors. The training, inspection and abatement may be regulated by environmental or public agencies separate from brownfield programs. Lead and asbestos removal involve removal of contaminated material in contained areas using specialized equipment.

The U.S. EPA's [Contaminated Site Clean-Up Information \(CUI-In\)](#) and the U.S. EPA Series [A Citizen's Guide to Cleanup Technologies](#) are web and fact sheet resources developed to introduce and explain common cleanup technologies, approaches and equipment used at Superfund, brownfield and other contaminated sites. Citizen's guide fact sheets focused on [Excavation](#), [Capping](#), [Bioremediation](#), [Phytoremediation](#), [In-Situ Treatment](#), [Solidification and Stabilization](#) were consulted in the preparation of this fact sheet.



EPA 560F19181  
September 2019

<https://www.epa.gov/brownfields/understanding-brownfields>



UConn

TAB Program: <http://tab.program.uconn.edu>

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# Example of an Infographic

## Prevent Childhood Lead Poisoning

Exposure to lead can seriously harm a child's health.

- Damage to the brain and nervous system
- Slowed growth and development
- Learning and behavior problems
- Hearing and speech problems

**This can cause:**

- Lower IQ
- Decreased ability to pay attention
- Underperformance in school

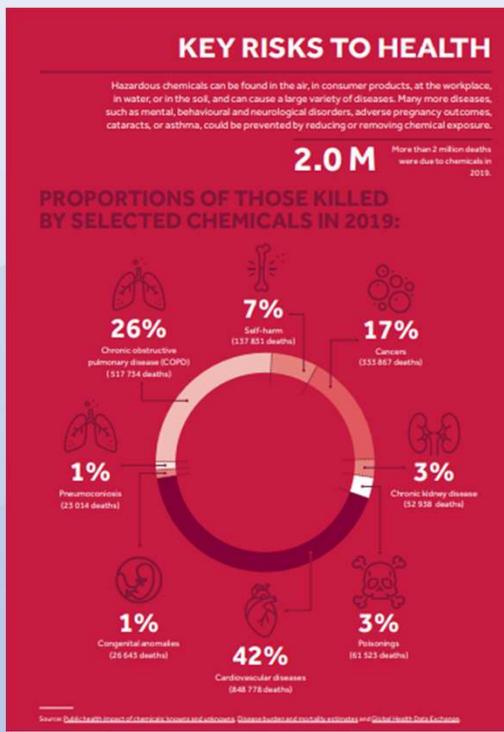
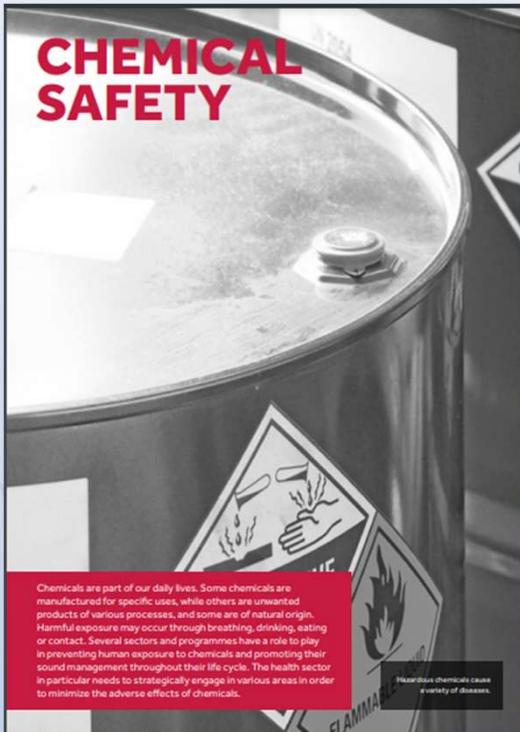
## Lead can be found throughout a child's environment.

- Homes built before 1978 (when lead-based paints were banned) probably contain lead-based paint.
- Certain water pipes may contain lead.
- Lead can be found in some products such as toys and toy jewelry.
- Lead is sometimes in candies imported from other countries or traditional home remedies.
- Certain jobs and hobbies involve working with lead-based products, like stain glass work, and may cause parents to bring lead into the home.

<https://www.cdc.gov/nceh/lead/docs/how-to-prevent-lead-poisoning-in-children-h.pdf>



# Example of an Infographic



Dirty water discharged into river.

### WHAT ARE KEY ACTIONS FOR IMPROVEMENT?

Implement the WHO Chemicals Road Map approved by the World Health Assembly in 2017, which comprises four action areas:

- 1. Risk reduction**  
Perform risk reduction, including through regulating chemicals (for example by implementing the Minamata Convention on Mercury and regulating lead paint), carrying out public education, and sharing best practices.
- 2. Knowledge and evidence**  
Fill the gaps in knowledge and evidence on chemical risks, including through biomonitoring and surveillance, and estimating the disease burden from chemicals.
- 3. Institutional capacities**  
Strengthen national institutional capacities to address chemical threats, including in response to chemical incidents and emergencies.
- 4. Leadership and coordination**  
Ensure leadership and coordination to promote the inclusion of health considerations in all chemical policies, and engagement of the health sector in chemicals management activities at the national, regional and international levels.

### MAIN WHO ACTIONS

WHO actions on chemical safety include the following:

- Countries and other stakeholders**  
Support countries and other stakeholders in implementing the WHO Chemicals Road Map.
- Norms, guidance and tools**  
Provide norms, guidance and tools to address chemicals of major public health concern.
- Awareness**  
Raise awareness, for example coordinating the International Lead Poisoning Prevention Week each year.
- Chemical risk assessment**  
Improve chemical risk assessment globally through the WHO Chemical Risk Assessment Network.

### SECTORAL POLICIES INTERACTING WITH CHEMICAL EXPOSURE

Cooperation with the following sectors may be required to sustainably reduce risks to health:

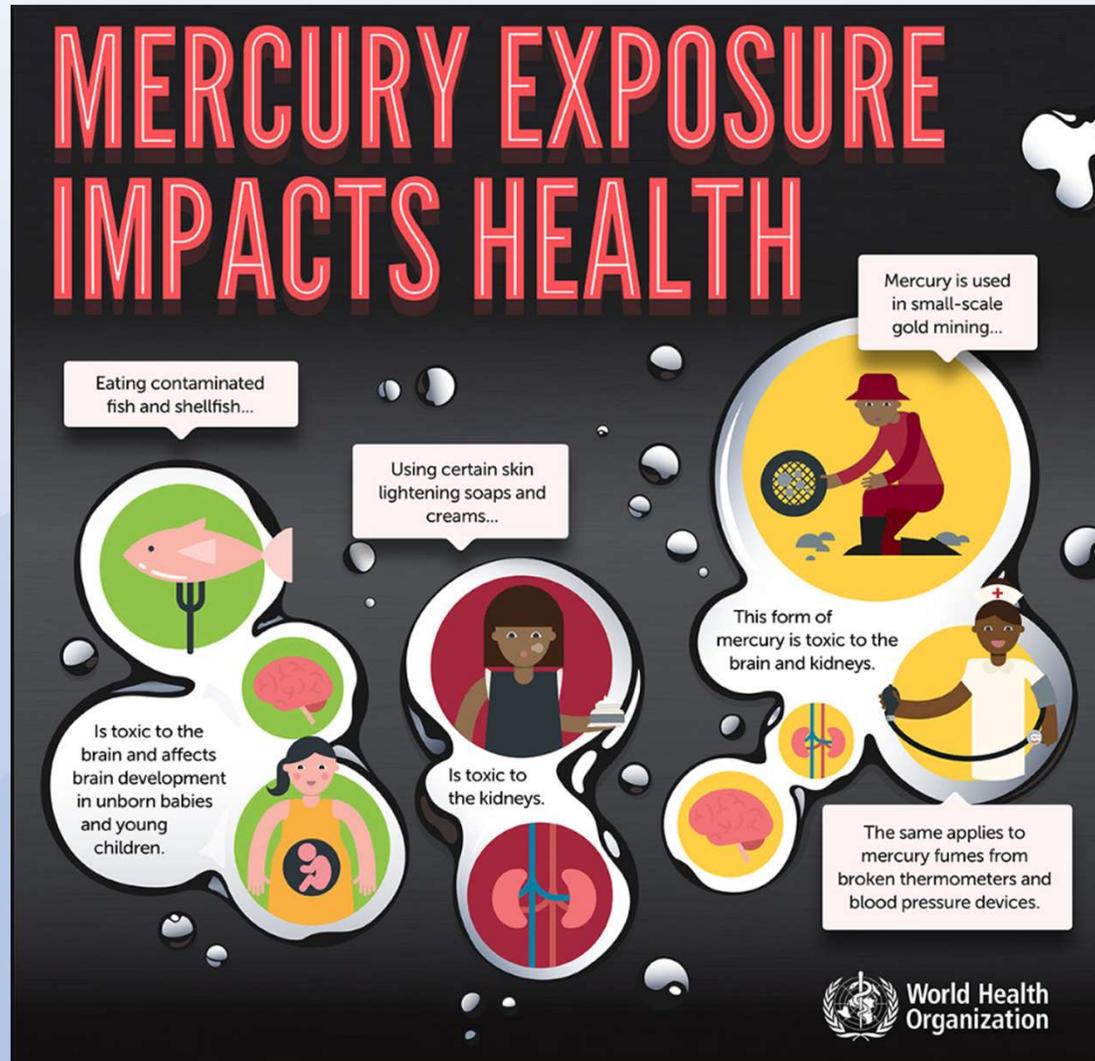
- Water and sanitation
- Industry
- Housing
- Agriculture
- Labour
- Health

Further information: [www.who.int/health-topics/chemical-safety](http://www.who.int/health-topics/chemical-safety)  
 Source: Healthy environments for healthier populations, why do they matter and what can we do?  
 Geneva: World Health Organization; 2019 (WHO/EURO/2019.05)  
 © WHO 2019. Some rights reserved. This work is available under the CC BY-NC-SA 4.0 IGO license.

[https://cdn.who.int/media/docs/default-source/chemical-safety/infogr-he5-chemical-safety-20082019-web-spreads.pdf?sfvrsn=bff32856\\_11n](https://cdn.who.int/media/docs/default-source/chemical-safety/infogr-he5-chemical-safety-20082019-web-spreads.pdf?sfvrsn=bff32856_11n)



# Example of an Infographic

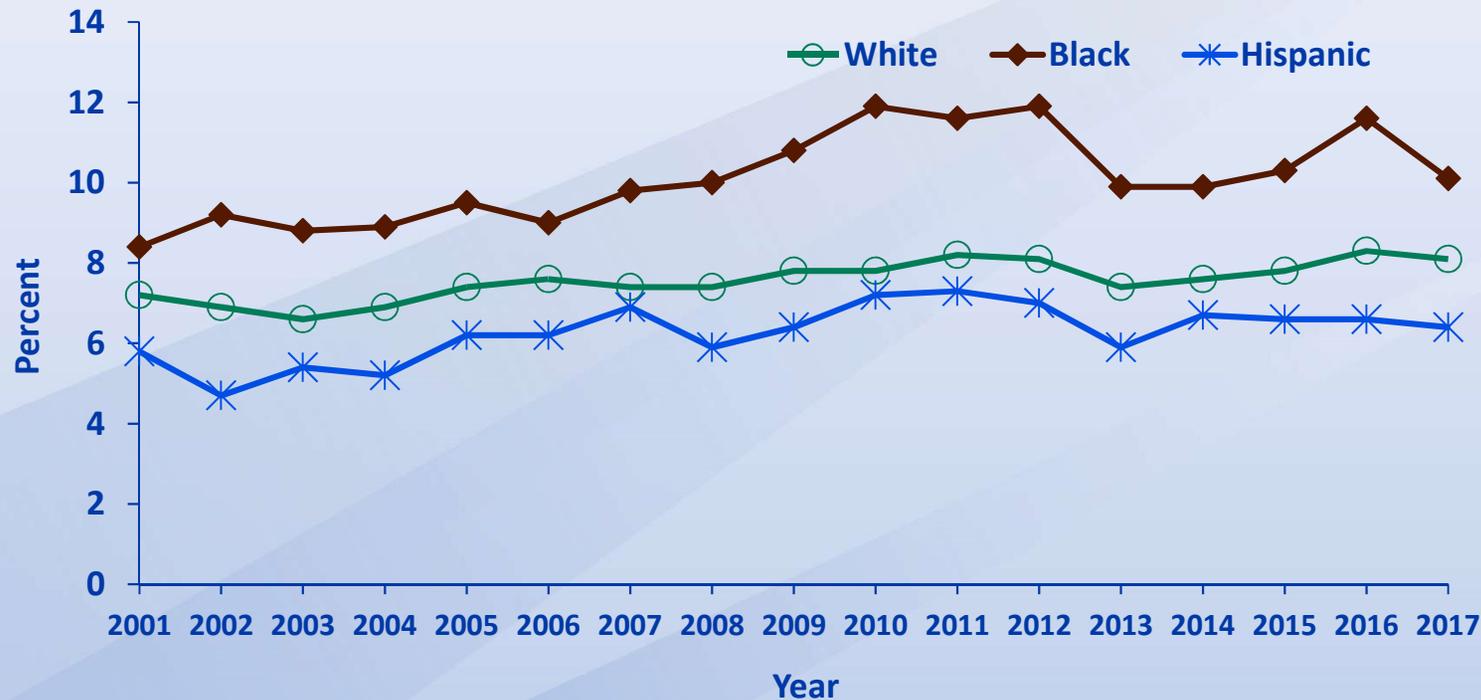


Infographic. Mercury exposure impacts health; 2017 - PAHO/WHO | Pan American Health Organization



# Example of a Graph

**Current Asthma Prevalence by Race and Ethnicity:  
United States, 2001-2017**



Blacks are more likely to have asthma than both Whites and Hispanics.  
Percent of current asthma increased for Whites, Blacks, and Hispanics from 2001 to 2017.

[https://www.cdc.gov/asthma/most\\_recent\\_national\\_asthma\\_data.htm](https://www.cdc.gov/asthma/most_recent_national_asthma_data.htm)

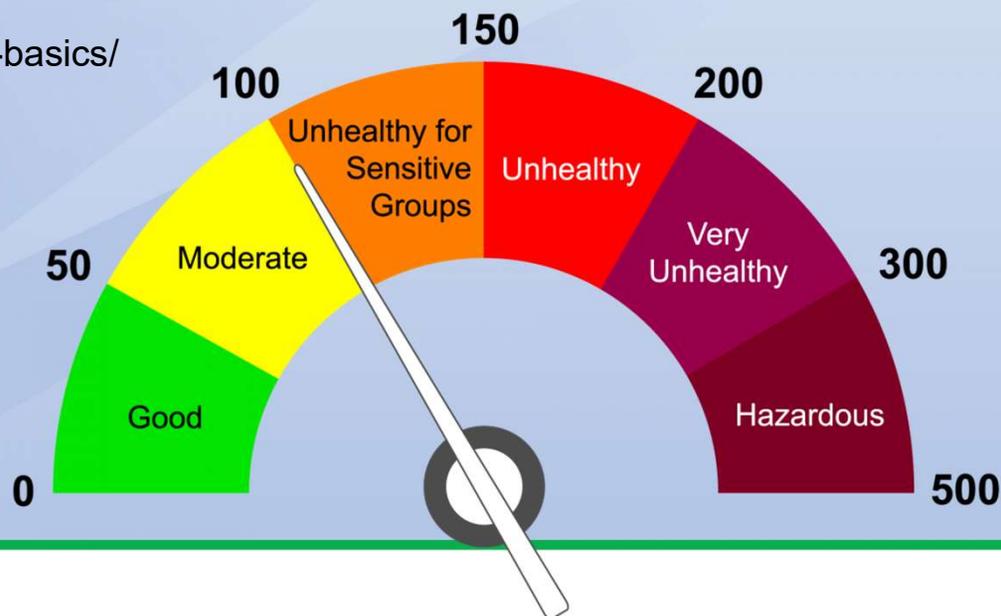


# Example of Indexing and Color Coding

## AQI Basics for Ozone and Particle Pollution

Daily AQI Color	Levels of Concern	Values of Index	Description of Air Quality
Green	Good	0 to 50	Air quality is satisfactory, and air pollution poses little or no risk.
Yellow	Moderate	51 to 100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Orange	Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Red	Unhealthy	151 to 200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Purple	Very Unhealthy	201 to 300	Health alert: The risk of health effects is increased for everyone.
Maroon	Hazardous	301 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

<https://www.airnow.gov/aqi/aqi-basics/>

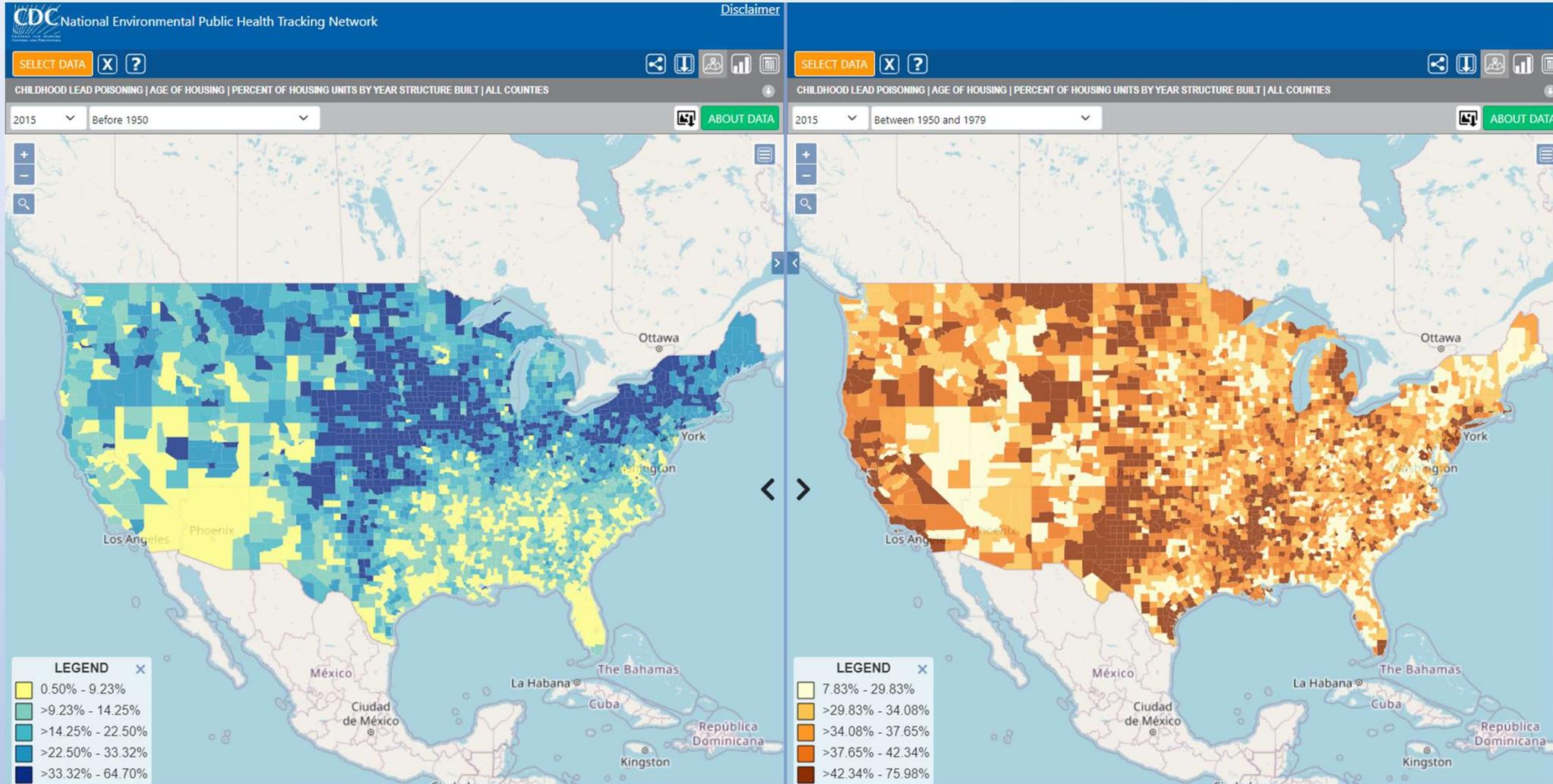


# Example of Mapping: Geographic Information Systems (GIS)

Multiple layers of information can be displayed

CDC National Environmental Public Health Tracking Network

Childhood Lead Poisoning by Age of Housing



<https://ephtracking.cdc.gov/DataExplorer/?c=6>



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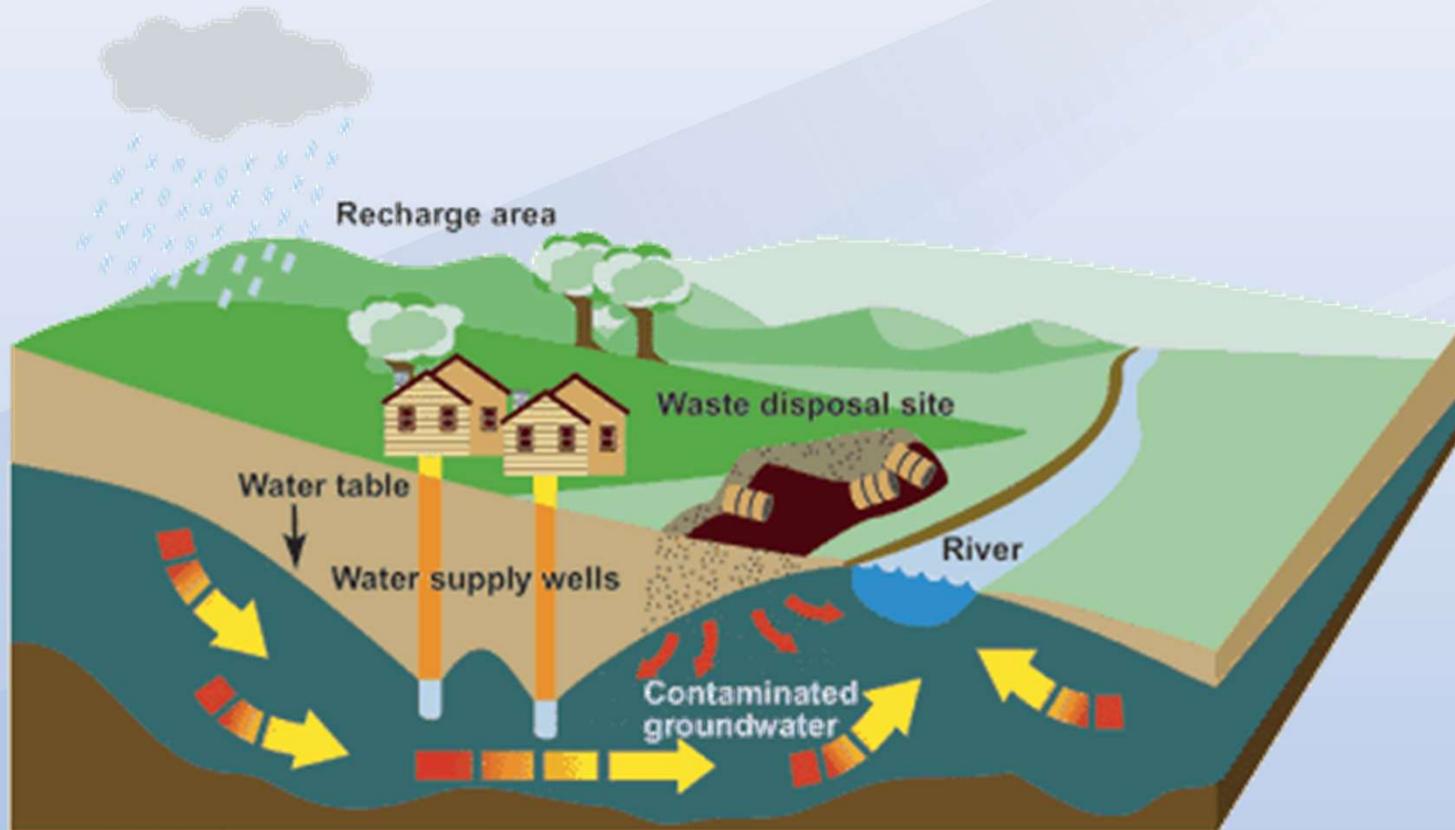
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# Example of a Diagram

## Groundwater contamination from a waste disposal site



<https://www.canada.ca/en/environment-climate-change/services/water-overview/pollution-causes-effects/groundwater-contamination.html>



# Social Media

## US EPA Twitter Feed

Home

Explore

Notifications

Messages

Bookmarks

Lists

Profile

More

**U.S. EPA** 18.3K Tweets

Our mission is to protect human health and the environment.

USA [epa.gov](http://epa.gov) Joined May 2008

689 Following 628.2K Followers

Followed by Community Child, CTFoodSystemAlliance, and 20 others you follow

Tweets Tweets & replies Media Likes

Pinned Tweet

**U.S. EPA** @EPA · Jun 15

EPA is inviting states and territories to apply for \$1 billion in Bipartisan Infrastructure Law funding to address PFAS and emerging contaminants in drinking water. Learn more about the funding and new drinking water health advisories for PFAS

**U.S. ENVIRONMENTAL PROTECTION AGENCY**  
NEWS RELEASE

[epa.gov](http://epa.gov)  
EPA Announces New Drinking Water Health Advisories for PFAS Che...  
EPA News Release: EPA Announces New Drinking Water Health Advisories for PFAS Chemicals, \$1 Billion in Bipartisan Infrastructure ...

<https://twitter.com/EPA>



# Example of Social Media – Facebook Page

**U.S. EPA - New England Region** ✓  
2.8K followers • 250 following

**Intro**  
US Environmental Protection Agency Region 1, protecting air, water & land in CT, MA, ME, NH, RI & VT

**Page** · Government organization

5 Post Office Sq, Ste 100, Boston, MA, United States, Massachusetts

+1 888-372-7341

r1web.mail@epa.gov

epa.gov/aboutepa/epa-region-1-new-england

Rating · 3.9 (18 Reviews) ⓘ

**Posts** Filters

**U.S. EPA - New England Region** ✓  
1h · 🌐

This year EPA is offering up to \$500 million in rebates for electric and low-emission school buses. Find out how your school and community can apply for a 2022 Clean School Bus Rebate and provide cleaner air for your kids and local community!

Join our free webinar this summer to learn more about the program and how to apply. Upcoming webinars will be held on June 22, 29, July 13, July 27 and Aug. 10.

Applications must be submitted by Aug. 19, 2022. Learn more at: <https://...> See more

**EPA Clean School Bus Program – 2022 Rebates**

**SUMMER WEBINAR SERIES**

Program Now Open!

EPA is offering \$500 million in rebates for electric and low-emission school buses.

**Register Today for the Webinars Below!**

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## Smart Growth

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# Podcast: Local Foods, Local Places in Harlan, KY

 [Harlan, KY, Podcast \(mp3\)](#)

Harlan, Kentucky, participated in the [Local Foods, Local Places](#) technical assistance program in 2017. Listen to this podcast to hear how Harlan is working to grow the local food economy and revitalize downtown.

*Podcast music: "Corporate (Technology)" and "Country Road Drive" by Scott Holmes, [www.scottholmesmusic.uk](http://www.scottholmesmusic.uk)  Attribution-NonCommercial License  "Marathon Man"  by Jason Shaw, Attribution 3.0 United States License .*

**Transcript**

### Community Stories

Read more [Local Foods, Local Places community stories](#).

<https://www.epa.gov/smartgrowth/podcast-local-foods-local-places-harlan-ky>



# Videos

The videos below provide additional information about essential elements of [The SALT Framework](#).

## Strategy



<https://youtu.be/UtwT1yi6l0I>

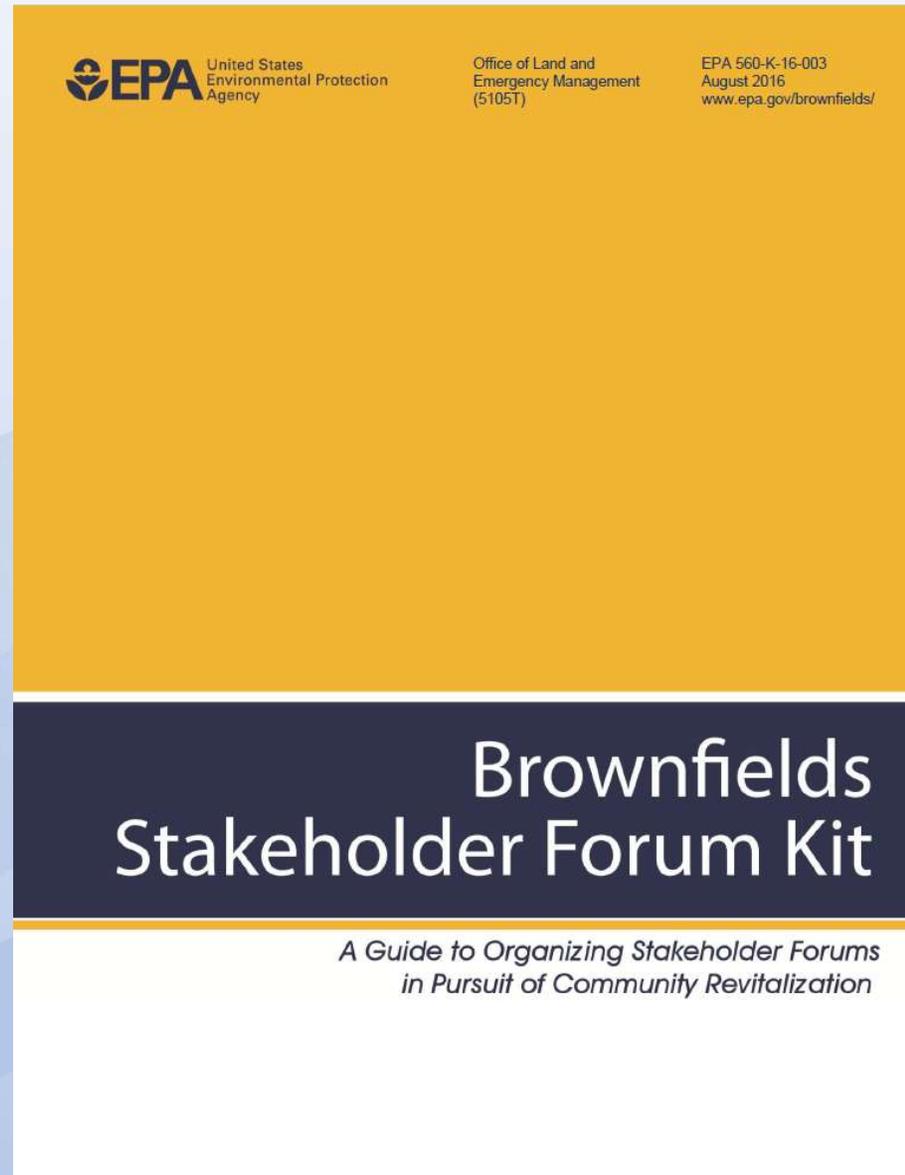
## Taking an Audience First Approach



<https://youtu.be/1i5VFb3i20E>



# Example of Stakeholder Forum



[https://www.epa.gov/sites/default/files/2016-09/documents/final\\_final\\_stakeholder\\_forum\\_toolkit\\_8.25.2016.pdf](https://www.epa.gov/sites/default/files/2016-09/documents/final_final_stakeholder_forum_toolkit_8.25.2016.pdf)



# Technical Assistance for Brownfields Program

## Workshops & Webinars

[https://tab.program.uconn.edu/workshops  
-webinars/#](https://tab.program.uconn.edu/workshops-webinars/#)

