

Attachment B

Fact Sheets

Ways to Reduce Your Exposure to Soil

Safe Gardening

Summary of the Public Health Assessment for Soils in the Newhall St. Neighborhood

What Can I Do To Reduce my Exposure To Soil in my Yard?

WHAT DOES IT MEAN TO BE EXPOSED?

In order to be exposed to chemicals in soil, you need to come into direct contact with soil that is contaminated and the chemicals need to get into your body. There are several ways you could be exposed to chemicals in soil in your yard:

- ◆ Ingestion
 - ⇒ Putting items into your mouth that have soil on them such as fingers, food, or toys.
 - ⇒ Eating food grown in contaminated soil that has not been completely washed or that has absorbed chemicals from the soil.
- ◆ Inhalation: breathing in soil dust
- ◆ Dermal: skin contact with soil



WHAT THINGS CAN I DO TO REDUCE MY CONTACT WITH SOIL IN MY YARD?

- ◆ Discourage children from playing in bare soil if possible, and make sure they wash their hands after playing outside, especially before eating.
- ◆ Bare soil areas beneath play equipment can be covered with mulch or clean topsoil.
- ◆ Clean up dirt that is tracked into the house. Use a wet mop whenever you can since sweeping or vacuuming can stir up dust into the air.
- ◆ Pets can bring dirt inside on their paws or fur. Try to keep pets clean.
- ◆ Consider using raised beds for gardening. Follow other gardening advice provided in CTDPH's fact sheet entitled "Growing and Eating Fruits and Vegetables in the Newhall Neighborhood of Hamden."
- ◆ Wash toys before bringing them into the house, or leave them outside.



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WHAT CONTAMINANTS HAVE BEEN FOUND IN SOIL IN THE NEWHALL NEIGHBORHOOD?

There are three main contaminants that have been found at elevated (higher than normal) levels in soil in some yards. These contaminants are **lead, arsenic and polycyclic aromatic hydrocarbons (PAHs)**.

Some **general** information about health effects from exposure to these chemicals is provided below. This information is not meant to imply that the health effects mentioned would be expected to occur among Newhall neighborhood residents.

LEAD

Lead is a naturally occurring metal in the environment. However, most of the high levels of lead found in the environment come from human activities. Lead has many uses, most importantly in the production of batteries. Because of health concerns, lead in gasoline, paints and ceramic products among others, has been dramatically reduced in recent years.

Exposure to lead is more dangerous for young children or unborn children who can be exposed to lead through their mothers. The nervous system is the most sensitive to lead exposure, particularly in children. Lead can affect a child's mental and physical growth. Children exposed to lead in the womb may be born prematurely, have lower birth weights and have slower mental development. Exposure to high levels of lead can affect the brain and kidneys of adults and children. Lead has not been shown to cause cancer in people.

ARSENIC

Arsenic is found in nature at low levels. The major uses of arsenic are as wood preservatives and agricultural pesticides. Arsenic is very widely distributed in the environment and everyone is exposed to low levels. Long-term exposure to arsenic can increase the risk of skin, bladder, kidney, liver and lung cancer. Exposure to arsenic can also lead to skin effects such as irritation and skin darkening.

PAHs

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic materials like tobacco or charbroiled meat. Studies in animals have shown that PAHs can affect the skin, blood, immune system and the ability to reproduce. These effects have not been reported in people. Some people who had long-term exposures to high levels of PAHs developed skin and lung cancer. Studies have shown that some PAHs caused cancer in animals.



For more information on these chemicals, visit the website for the Agency for Toxic Substances and Disease Registry (ATSDR) <http://www.atsdr.cdc.gov>

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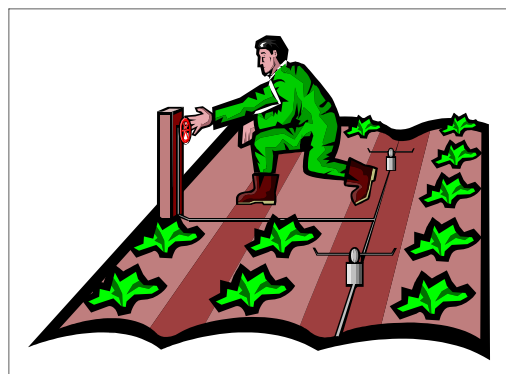
GROWING AND EATING FRUITS AND VEGETABLES IN THE NEWHALL NEIGHBORHOOD OF HAMDEN

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Many people have asked whether it is safe to grow and eat fruits and vegetables from gardens in their yards. This fact sheet will provide information so you can enjoy growing and eating your fruits and vegetables safely. By taking a few simple precautions, you can reduce your chances of being exposed to contaminants in the soil and you can still enjoy your homegrown produce.

Many of the homes in the Newhall neighborhood in Hamden were built on top of a landfill that was used for disposal of domestic and industrial waste during the 1930s, 1940s and 1950s. Three chemicals have been found at elevated levels in surface soil in some yards in the neighborhood. They are arsenic, lead and polycyclic aromatic hydrocarbons (PAHs).



There is some background information about each of these three chemicals at the end of this fact sheet.

We believe it is likely that the most contaminated yards in the neighborhood have been identified and cleaned. If you have questions about sampling and cleanup activities in the neighborhood, you should call CT DEP at the phone number listed on page 4 of this fact sheet.

What does it mean to be exposed?

To be exposed to chemicals in soil, you need to come into contact with soil that is contaminated and the chemicals need to get into your body. Exposure to chemicals in soil can occur in the following ways.

- **Eating:** You can be exposed by eating in two ways:
 - ⇒ putting fingers in your mouth that have soil on them, or
 - ⇒ eating food grown in contaminated soil that has not been completely washed or that has absorbed chemicals from the soil.
- **Breathing** soil dust
- **Skin contact:** Some chemicals can be absorbed through the skin. This is an unlikely type of exposure because the chemicals found in the Newhall neighborhood are poorly absorbed through the skin.

Preparing Your Garden

Growing fruits and vegetables in raised beds with new topsoil is the best way to prevent exposure to chemicals in the soil. If you cannot use raised beds, adding organic material such as compost or new topsoil to your garden will enrich your soil. This will also dilute the amount of contaminants in the soil and will reduce your chances of exposure. Also, plants tend to absorb less chemicals if the soil is close to neutral pH (6.5-7.0) and has adequate levels of nutrients.



- ⇒ Adding a balanced commercial fertilizer to your garden soil can help maintain correct levels of nutrients.
- ⇒ If your soil is too acidic (low pH), adding lime will bring the pH up to the neutral range.

How do I know if my soil has the correct level of nutrients and pH?

The Connecticut Agricultural Experiment Station will do fertility and pH tests on your garden soil for free. Based on your test results, they will recommend what to add to your soil. For more information, contact the CT Agricultural Experiment Station, 123 Huntington Street, New Haven, 203-974-8521.

Can I have the soil in my garden or my homegrown produce tested for contaminants?

Additional soil sampling in the neighborhood will take place in the near future. If you are interested in having testing done sooner, there are private labs that will test soils or homegrown produce for a charge. These labs can be found in your local yellow pages under “environmental laboratories.” You may also call the Quinnipiac Valley Health District at 203-248-4528 to learn how you can have your garden soil tested for free.

Selecting Which Crops to Grow



The best crops to plant are *fruiting* crops such as tomatoes, squash, peppers, okra, cucumbers, peas, beans and corn. These plants take up (accumulate into parts of the plant) very little, if any, contaminants in the parts we eat.

Root crops (such as carrots, beets and potatoes) can take up arsenic and lead from the soil. Most of the contamination can be removed by peeling the skin off root vegetables before eating. Even after peeling, a small amount of the chemicals will remain in the flesh of the root vegetable. If you peel these vegetables - and grow and eat less of these type of vegetables - you will have less chance of being exposed to lead and arsenic in the soil.

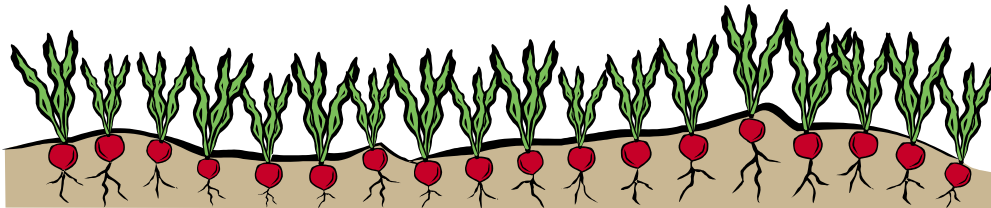
Leafy greens (such as lettuce, spinach, beet greens and herbs) can take up lead from the dust or soil that settles on leaf surfaces. If you grow less leafy greens crops, you will have less chance of being exposed to lead in the soil.



Key Tip: It is better to grow more fruiting crops such as tomatoes, squash and beans; and fewer root (potatoes, beets, etc.) and leafy green (lettuce, spinach, etc.) crops.

Working in Your Garden

- Avoid eating and drinking while working in your garden because you could swallow soil and dust that gets on your hands and food.
- Wash your hands and work clothes to remove dust and dirt after gardening.
- Take off your shoes at the door to avoid tracking a lot of soil into your home.



Preparing Fruits and Vegetables

Contaminated dust or soil can settle on to the surfaces of the plant. Following these guidelines will prevent or reduce your exposure to contaminants.

- Wash all homegrown produce before eating it. Use a 1% vinegar solution, soapy water or a commercial vegetable-cleaning product. Washing produce is a good idea whether it is homegrown or comes from a market.
- Soak leafy greens in cool water and rinse thoroughly before cooking. This is especially important for greens that grow low to the ground, such as collard greens, spinach or lettuce.
- Scrub root vegetables with a clean brush to remove dirt. Peel root vegetables such as carrots, turnips or potatoes before eating. The skin of root vegetables often contains more contaminants than the flesh.
- Wash the edible portion of fruiting crops such as tomatoes, squash or peppers before eating to remove any soil adhered to the outside skin or peel.

Contaminant Summary Chart

| Chemical | Health Concerns | Effect on Vegetables |
|----------------|--|--|
| Lead | Lead can affect a child's mental and physical growth. Lead is not believed to cause cancer in people. | Lead in soil can be absorbed into root crops and leafy greens. Lead in dust or soil can settle on surfaces of the plant. |
| Arsenic | Long-term exposure to <u>high</u> levels of arsenic can irritate and darken the skin, and increase the risk of skin, bladder, kidney, liver and lung cancer. | Arsenic in soil can be absorbed into root crops. Arsenic in dust or soil can settle on surfaces of the plant. |
| PAHs | Some people who had long-term exposures to <u>high</u> levels of certain PAHs developed skin and lung cancer. | PAHs are not easily absorbed into plants. PAHs in dust or soil can settle on leaf surfaces. |

I already ate produce from my garden without following this advice. Will I get sick?

If you have already eaten homegrown produce and did not follow the advice in this fact sheet, the health risks are still very low. You would need to have many years of exposure to high levels of lead, arsenic and PAHs before health effects would become more likely. In addition, the levels of lead, arsenic and PAHs in the soil in your neighborhood are not high enough to present any immediate health concerns.

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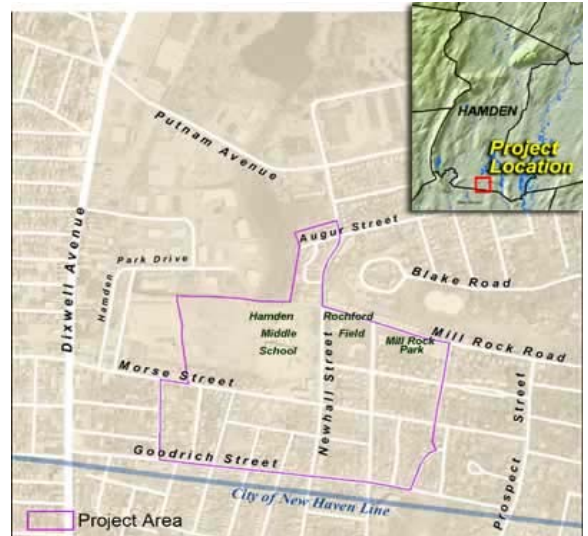
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Residential Soils in the Hamden Newhall Street Neighborhood

BACKGROUND

The Connecticut Department of Public Health (CTDPH) has reviewed environmental data for contaminated soils in the Newhall neighborhood to determine whether landfill waste in residential soils is a public health hazard. Based on this data, CTDPH has written a Public Health Assessment (PHA). A PHA looks at environmental sampling data, the concerns of the neighborhood, and readily available health information about the community. The purpose of this fact sheet is to summarize the findings of the **public comment version** of the PHA. This PHA builds on the results of three other documents that looked at landfill waste and health concerns at the Hamden Middle School, two town parks and the Newhall Street School. For more information about the PHA process, contact CTDPH at the number on the back of this fact sheet, or go to www.newhallinfo.org. We are accepting comments and questions about the PHA until May 3, 2004. If you would like a copy of the PHA, please call (860) 509-7742, or go to the web site provided above.



ABOUT THE SITE

The Newhall neighborhood is an 11-block area located in the southern portion of Hamden, Connecticut. During the 1930s, 1940s and 1950s, domestic and industrial waste was disposed in wetlands and other low spots throughout the area. Many of the homes in the neighborhood were built on top of landfill waste. The area has about 238 homes with around 600 residents. The map above shows the boundaries of the known or suspected landfill waste. Not all homes in the mapped area necessarily have landfill waste. The landfill boundaries may change in the future, as the environmental investigations continue.



WHAT CONTAMINANTS WERE FOUND?

The environmental investigations in the Newhall neighborhood have focused on residential soil, both on and below the surface. CTDPH looked at results of over 1000 soil samples from the neighborhood that were collected by the Environmental Protection Agency (EPA), the CT Department of Environmental Protection (CTDEP) and Olin Corp. These included soil samples taken from about 100 different yards. The main contaminants found at elevated (higher than normal) levels are lead, polycyclic aromatic hydrocarbons (PAHs), and arsenic. Lead was the contaminant found most often at levels exceeding CT's cleanup standard for lead in soil. However, not every home that was tested had high levels of contaminants. About one-half of the surface soil samples were above the lead standard. Less than a quarter of the samples had high levels of arsenic or PAHs. Thirteen homes had very high levels of lead. These yards were cleaned up 2 years ago by EPA.



HOW DO WE EVALUATE HEALTH RISKS?

It is important to understand how CTDPH evaluates exposures and how we make **decisions about health risks** for hazardous waste sites. The first step is to find out if there has been exposure to contaminants. Then we try to find out how long people were exposed and to how much contamination. Then we estimate cancer and other health risks. Finally, we come to a conclusion about whether the exposure is likely to cause illness. If we conclude that exposures may have caused disease, we may recommend further studies. Here are some concepts important in evaluating health risks to contaminants:

- **“Exposure”** means that you have come into contact with a chemical (breathing, eating, touching), and it has gotten into your body.
- If you are **not exposed** to a chemical, **it won’t make you sick**.
- CTDPH is required to use accepted science-based methods when we evaluate health risks. When CTDPH analyzes environmental data, we use conservative (most protective of health) health guidelines and approaches to reach our conclusions and make our recommendations.
- It is very difficult to determine if people have gotten sick from a site, even though it may be shown that people were likely exposed. This is because of many complicated factors:
 - ⇒ Were people exposed long enough and to enough of the contaminant?
 - ⇒ What are other exposures?
 - ⇒ What are some lifestyle issues such as diet, smoking, etc?

Just because we may not be able to say that people have gotten sick from contaminants, this does not mean the community should not be concerned or work to clean up the site. Preventing exposures is very important!



WERE PEOPLE EXPOSED? ARE HEALTH EFFECTS LIKELY?

Neighborhood residents could be exposed to landfill contaminants through contact with contaminated soil while working or playing in their yards (eating soil, skin contact, breathing in soil particles). Children may have a greater opportunity for exposure than adults because they play on the ground and have more hand-to-mouth activity. Residents will not be exposed to landfill contaminants buried below the ground surface unless they dig into the soil. CTDPH evaluated the soil data and how people could be exposed and reached the following conclusions about health effects:

- The yards with the highest levels of lead in surface soil may have caused increases in blood lead levels in children in the past. **Fortunately, these homes have been already cleaned up by EPA so exposures are no longer occurring.**
- Based on a review of files on blood lead levels in children in the Newhall neighborhood, no high levels were found that could be related to lead exposure from landfill waste.
- There are still some homes with elevated lead in surface soil. If exposure is not stopped through cleanup of soil or other means, there could be future exposures that might result in increases in blood lead among children.
- Other contaminants in soil such as arsenic and PAHs are unlikely to cause health problems such as cancer or other non-cancer diseases.



PUBLIC HEALTH ACTIONS ALREADY TAKEN

Since the time contamination was first discovered in the Newhall neighborhood in early 2001, a number of activities have taken place to protect neighborhood residents:

- **Soil Removal:** EPA removed contaminated soil from 13 residential properties in late 2001 and early 2002. This soil removal is not a permanent remedy because some contaminants still remain in soils deeper than 18 inches.
- **Home Visits:** In May and June 2001, CTDPH and EPA met with residents of about 76 properties that were sampled by EPA. Results of the soil tests were provided to each resident and next steps were discussed. CTDPH answered questions about exposure and health impacts.
- **Blood Lead Screening:** The Quinnipiack Valley Health District (QVHD) offered free blood lead screening to neighborhood residents on August 1, 2001.
- **QVHD Lead Exposure Follow Up Activities:** CT DEP referred a number of homes to the QVHD for lead exposure follow-up activities. The homes referred for follow-up had elevated lead in surface soil, where young children reside (or visit often), that were *not* scheduled to receive soil removal by EPA. At some of these homes, the source of the lead in soil was lead paint, not landfill waste. Follow-up activities included providing educational materials about lead exposure and observing yards and suggesting ways to reduce soil exposure.
- **Community Health Concerns Survey:** During May and June 2001, staff from the QVHD collected health information from 125 local residents in the neighborhood. CTDPH evaluated the information and concluded that the numbers and types of cancers and other illnesses that were reported did not look unusual. QVHD is currently doing an expanded community health concerns survey in the neighborhood.
- **Methane Screening in Homes:** Beginning in April 2001, the Hamden fire marshal sponsored a voluntary **methane** screening program in the neighborhood. Methane is an explosive gas that can come from some landfills. 12 homes asked for and received methane screening. CTDEP consultants also tested for methane in about 30 homes. *Methane was not detected in any homes.*
- **Residential Structural Evaluations:** Many of the residents have settling problems with their homes. CTDEP hired engineering consultants to investigate this problem. They have identified 42 homes with real or possible settlement problems. This investigation is still going on. During the site cleanup process, CTDEP will repair the homes where needed.
- **Gardening Fact Sheet:** CT DPH has prepared and distributed a fact sheet on how to safely grow and eat fruits and vegetables.



WHAT DOES CTDPH RECOMMEND?

- ◆ Residents should follow the advice in CTDPH's fact sheets regarding how to reduce your exposure to soil and how to grow fruits and vegetables safely.
- ◆ Further investigation of landfill waste in the Newhall neighborhood should proceed as quickly as possible so that a permanent remedy will be in place as soon as possible.
- ◆ QVHD should offer free blood lead screening again in the Newhall neighborhood.



FUTURE ACTIVITIES IN THE NEWHALL NEIGHBORHOOD

- CTDPH will continue to work with the QVHD and CTDEP to provide technical assistance regarding developing sampling plans and evaluating data.
- CTDPH will evaluate new sampling data from the neighborhood as it becomes available and will update the Public Health Assessment, if needed.
- CTDPH will continue to participate in public meetings, availability sessions and other ways to help the neighborhood understand the site health issues.
- CTDPH will work with QVHD to evaluate data from the community health concerns survey.
- CTDPH will work with the QVHD, the Town of Hamden and CTDEP as necessary to ensure that recommendations made in this Public Health Assessment are carried out in a reasonable time frame.
- CTDPH will hold an “open house” for residents to provide comments and have questions answered about the Public Health Assessment.



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