

Report Name: *Initial Investigation Findings Report: Newhall Street Residential Area, Hamden, Connecticut*

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What Is This Report About?

This report is about what Olin Corporation found during their first study of the residential properties within the overall Newhall Street Study Area. The study was done to find out if fill was present in some residential areas that had not been tested yet and to learn more about the chemicals and other possibly harmful substances (contamination) in the soil on these and other properties where fill was known to exist. Olin Corporation completed this study voluntarily in Summer 2002 before the Consent Order to investigate and “remediate” (clean up) the residential properties in the Newhall Street Study Area (sometimes called the Newhall Street site) was agreed to in April 2003. This is the first study done by Olin, but they will need to learn more about the contamination before they can clean it up. They knew they would need to do additional studies. That is why this first study was called an initial investigation.

Why Did They Investigate?

The soil contamination found in the Newhall Street neighborhood is associated with landfills that were located in the area from the late 1800s through the 1950s. A variety of fill materials (such as household garbage, industrial waste, and soil from other places) was thrown away in the dumps. The purpose of this initial investigation was to do three things:

- Find out the extent of the fill materials beneath the residential properties.
- Find out what contaminants are in the fill and soil.
- Begin to learn whether the soil contamination has affected the groundwater.

Where Did They Investigate?

The Newhall Street residential properties were separated into five different testing areas (see map).

1. **Southwest Satellite Area:** The area bounded by Morse Street to the north, Goodrich Street to the south, St. Mary Street to the west and Newhall Street to the east.
2. **Morse Street Area:** The area bounded by the Hamden Middle School athletic fields to the north, Morse Street to the south, 279 Morse Street to the west, and 259 Morse Street to the east.
3. **Newhall Street Area:** The area bounded by Newbury Street to the north, Goodrich Street to the south, Newhall Street to the west, and Winchester Avenue to the east.
4. **Bryden Terrace Area:** The area bounded by Mill Rock Park to the north, Goodrich Street to the south, Winchester Avenue to the west, and Wadsworth Street to the east.
5. **Augur Street Area:** The area bounded by the properties north of Augur Street, Mill Rock Road extension to the south, the Regional Water Authority property to the west, and Newhall Street to the east.

How Did They Test The Soil And Water?

Soil borings were taken at 80 locations in the five residential testing areas. The borings were used to determine the locations and approximate boundaries of fill materials (in contrast to areas with native soils). Seventy-eight (78) of the borings were tested for contaminants. Soil or fill from the borings was tested for contaminants at the following depths:

- In the soil just below the surface of the ground (0-3 inches in depth)
- In the fill material below the surface soil
- In the soil underneath the fill material (the underlying soil).

Water samples were taken from under the ground surface (groundwater). These groundwater samples were taken when the testing devices reached groundwater during soil sampling. There was a drought at the time of the study, so the groundwater was sometimes deeper than the soil samples. This prevented the collection of groundwater samples in some locations.

What Contaminants Were Tested For?

The contaminants tested for in the soil and water samples are listed below. For each substance, you can click on its name to go to another website that describes what it is and how it may be harmful. Of the full list of substances, all soil samples -- whether they had fill or not -- were tested for lead and arsenic. Only the samples that had fill material were tested for the full list. The substances tested for were:

- Lead and arsenic
- Other metals
- Extractable Total Petroleum Hydrocarbons (ETPH)

- Volatile Organic Compounds (VOCs)
- Semi-Volatile Organic Compounds (SVOCs)
- Polycyclic Aromatic Hydrocarbons (PAHs)
- Pesticides and Poly-Chlorinated Biphenyls (PCBs)

An additional test was done on some of the soil samples, called a Synthetic Precipitation Leaching Procedure (SPLP). The SPLP test shows how metals might move from soil into water (such as when it rains). The SPLP test was done for lead, arsenic, and other metals when these substances were found in the soil at concentrations higher than state standards for soil (explained in the next paragraph).

The study compared the levels (concentrations) of the contaminants found in the soil and water samples to several different state standards. The standards identify the concentrations of substances that could be potentially harmful to people who come into contact with them. The standards were developed to protect people's health and the environment.

The concentrations of substances found in the soil samples were compared to:

- Residential Direct Exposure Criteria (RDEC): The RDEC sets a contaminant concentration level for many different substances. Substance concentrations below the RDEC level are considered not harmful in a residential setting. Contaminant concentrations at or above the RDEC require further investigation to determine the potential risk to people's health.
- GA/GAA Pollutant Mobility Criteria (GAPMC): This state standard relates to the ability of soil contaminants to pollute groundwater. Soil contaminants with concentrations at or above the GAPMC could result in polluted groundwater and require further investigation to determine the potential risk to groundwater resources that may be used for people's drinking water.

The concentrations of substances found in the groundwater samples were compared to:

- Groundwater Protection Criteria (GWPC): The GWPC sets a concentration level for many different substances in water. Contaminant concentrations below this level are considered not harmful. Contaminant concentrations above this level require further investigation to determine the potential risk to the quality of groundwater resources.
- Residential Groundwater Volatilization Criteria (RGWVC): This is a state standard that sets concentration levels for certain types of chemicals that may give off dangerous fumes from groundwater in residential areas.

Contaminant concentrations below the RGWWC are considered not harmful. Contaminant concentrations above this level require further investigation to determine the potential risk to people's health.

What Did They Find?

The study identified where fill materials were found. These are areas where dumping probably took place. The study included maps showing the approximate extent and depths of the fill in each of the five residential areas. The levels of contaminants found were reported for each sample location, so the report included many pages of scientific testing data. Some test locations did not show any contamination but all five residential areas had some contamination in the fill areas. Some test locations had substances in small amounts -- in concentrations lower than the state standards.

The fill locations and contaminants found in each of the five residential areas are described below. Only the substances found in high concentrations – at or above the state standards – are listed. Those are likely to be the primary contaminants requiring further investigation in regard to clean-up efforts. For a complete listing of the study findings please refer to the report itself. Note that where “SPLP lead”, “SPLP arsenic” or “SPLP other metals” is noted, it means that the metal (lead, arsenic, or other metals) was found in the soil at levels high enough to possibly pollute groundwater (as described in the previous section).

The report made no conclusions about the health risks from contaminants or about how to remediate the pollution. The report ended after presenting the test results (summarized below).

Southwest Satellite Area

In this area, the study found three oval-shaped areas of fill beneath the ground. These ovals are connected and extend from the east side of Butler Street in a northwest direction nearly to the corner of Morse Street and St. Mary Street. The fill was found to be up to 20 feet deep in some areas.

The study found soil contamination just below the surface, within the fill material itself, and in some areas below the fill material. Groundwater contamination was also found. The contaminants found in levels at or above state standards are listed below.

<u>In the Soil</u>	<u>Contaminants Found In Levels At or Above State Standards</u>
Just Below the Soil Surface (0-3 in.)	Arsenic, SPLP arsenic, lead, SPLP lead
Within the Fill Material	Arsenic, SPLP arsenic, lead, SPLP lead, other metals (2), other SPLP metals, ETPH, PAHs

In the Underlying Soil	SPLP arsenic, SPLP lead, lead
<u>In the Groundwater</u>	Antimony (a metal), VOCs, SVOCs

Morse Street Area

The study found two half-circle-shaped areas of fill, located on the northern portion of the properties along Morse Street. The study noted that these areas are probably connected to the fill under the Hamden Middle School athletic field. The fill in this area was noted to be up to eight feet deep.

The study found soil contamination just below the surface, within the fill material itself, and in some areas below the fill material. Groundwater contamination was also found. The contaminants found in levels at or above state standards are listed below.

<u>In the Soil</u>	Contaminants Found In Levels At or Above State Standards
Just Below the Soil Surface (0-3 in.)	SPLP lead
Within the Fill Material	Arsenic, SPLP arsenic, lead, SPLP lead, other metals (2), other SPLP metals (2), ETPH, SVOCs, PAHs
In the Underlying Soil	Arsenic, SPLP arsenic, lead, SPLP lead,
<u>In the Groundwater</u>	VOCs (1)

Newhall Street Area

The study found an oval-shaped area of fill material beneath the ground running north-south on the western part of this area (along Newhall Street). The fill was noted to be up to 13 feet deep in some areas.

The study found soil contamination just below the surface, within the fill material itself, and in some areas below the fill material. Groundwater contamination was also found. The contaminants found in levels at or above state standards are listed below.

<u>In the Soil</u>	Contaminants Found In Levels At or Above State Standards
Just Below the Soil Surface (0-3 in.)	Arsenic, SPLP arsenic, lead, SPLP lead
Within the Fill Material	Arsenic, SPLP arsenic, lead, SPLP lead, other metals (3), other SPLP metals (2), ETPH, PAHs

In the Underlying Soil	SPLP arsenic, SPLP lead,
In the Groundwater	PAHs (1), VOCs (1), & SVOCs (1)

Bryden Terrace Area

The study found that there is a lot of fill under the ground in this area. Most of it is north of Morse Street and appears to continue into Mill Rock Park and Rochford Field. The fill was noted to be up to 11 feet deep in some areas.

The study found soil contamination just below the surface, within the fill material itself, and in some areas below the fill material. Groundwater contamination was also found. The contaminants found in levels at or above state standards are listed below.

<u>In the Soil</u>	Contaminants Found In Levels At or Above State Standards
Just Below the Soil Surface (0-3 in)	Arsenic, SPLP arsenic, lead, SPLP lead
Within the Fill Material	Arsenic, SPLP arsenic, lead, SPLP lead, other SPLP metals (1), ETPH, VOCs (1), SVOCs (1), PAHs (8)
In the Underlying Soil	SPLP arsenic, SPLP lead
In the Groundwater	Arsenic, VOCs (1), SVOCs (1), PAHs (4)

Augur Street Area

The study found an oval-shaped area of fill beneath the ground running north-south along the western part of this area. The fill was noted to be about six feet deep in some areas.

The study found soil contamination just below the surface and within the fill material itself. No groundwater contamination was found. The contaminants found in levels at or above state standards are listed below.

<u>In the Soil</u>	Contaminants Found In Levels At or Above State Standards
Just Below the Soil Surface (0-3 in.)	SPLP lead
Within the Fill Material	ETPH, PAHs
In the Underlying Soil	None found

In the Groundwater

None found