# Your Health: Facts for Navy Families in Naples

# About: Vapor Intrusion

*The U.S. Navy is committed to ensuring our families are safe while serving our country at home or overseas. The following information is provided as part of a wide-ranging effort to understand the health risks of our personnel and families living in Naples, Italy. A comprehensive Public Health Evaluation (PHE) was conducted to assess potential short and long-term health risks associated with living in the Naples area (see sidebar). In line with our commitment to continually share important health information, we encourage you to review the following.*

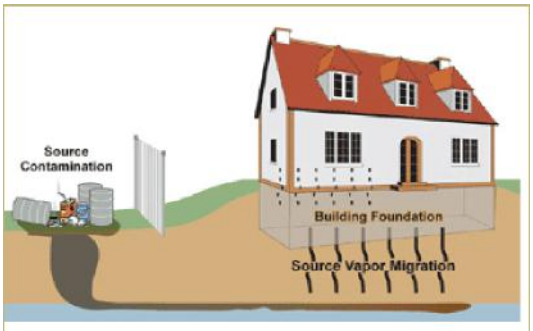
An important Public Health Evaluation (PHE) was completed under the guidance of the Navy and Marine Corps Public Health Center. The PHE was designed to evaluate the potential short- and long-term health risks associated with living in the Naples area as a result of inadequate trash collection, un-controlled open burning of uncollected trash, and widespread dumping of waste, including chemical and other hazardous waste.

Launched in 2008, the PHE involved collection of air, water, soil and soil gas samples from throughout the region to identify whether there were potential health risks.

For details and background information, visit the website listed at the bottom of this page.

## What is Vapor Intrusion?

Vapor intrusion occurs when chemicals in soil or groundwater get into indoor air. This happens when there is contamination under a structure, like a home or office building, and the contamination finds its way inside the structure such as through small cracks or gaps in the foundation. Volatile Organic Compounds (VOCs) are liquid chemicals that evaporate easily at room temperature. When VOCs are spilled on to the ground they can seep into the soil and groundwater. The chemicals can easily travel through groundwater or through soil as vapors. If conditions are right, these vapors can then move up through the soil and groundwater into nearby buildings or homes. This is known as Vapor Intrusion. Heating, air conditioning and ventilation can draw these vapors into buildings. Soil vapors can also enter buildings through cracks in the concrete-slab floors, basement floors, sump pumps or wherever electrical wires or pipes penetrate the foundation.




Chemicals that evaporate easily are called "volatile" chemicals. Under certain conditions, volatile chemicals can move from underground into the indoor air of overlying buildings through a process known as ***"vapor intrusion."***

## Where do VOCs come from?

VOCs are found in a variety of everyday products and have been widely used in industrial and household products for more than 100 years because of their dissolving and cleaning properties. A wide variety of common products used in homes, offices and schools contain VOCs, such as perfumes, hair sprays, shoe polish, mothballs, rug and oven cleaners, paints, lacquers and thinners, cigarette smoke, and more.

In addition to exposure from everyday products, VOCs have been discovered in soils and groundwater due to leaking storage tanks, accidental spills, and improper refuse disposal and hazardous waste disposal practices such as have occurred in Naples.

## How can I be affected by Vapor Intrusion?

Many factors impact individual health effects from exposure to VOCs through vapor intrusion, including the material itself, length of exposure, amount of exposure, and pre-existing health conditions. In general, immediate effects can include eye, nose, and throat irritation; headaches; nausea; memory impairment; and visual disorders. Exposure to high amounts of chlorinated VOCs can cause dizziness, reduce the ability to concentrate, damage the nervous system, and cause an irregular heartbeat. Long-term exposures can result in damage to the liver, kidney, and central nervous system. Studies indicate that exposure to some chlorinated VOCs may result in cancer.

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## Why is Vapor Intrusion an issue in Naples?

The Commander, Navy Region Europe, Africa, Southwest Asia (CNREURAFSWA), with the assistance of the Navy and Marine Corps Public Health Center, completed a comprehensive health study (see sidebar on page 1). The Public Health Evaluation (PHE) results showed the presence of VOCs in water from private wells, likely due to historical improper dumping and hazardous material disposal. This created the potential for vapor intrusion to occur in buildings that were located near VOCs in soil and/or groundwater.

Tetrachloroethene (a VOC, also known as perchloroethene or PCE) was found in the tap water and soil gas of many homes. The presence of PCE in tap water and soil gas was primarily in homes on well water or where a home's city water supply was contaminated, likely due to a home's improper connection to both a well and city water supply.

## What did the Navy learn?

The Naples PHE was a big step toward determining the potential for health risks in the area as a possible result of improper trash disposal (including burning) and hazardous waste disposal. The goal was to develop as clear a picture as possible of what was happening and then take necessary steps to protect the health of our families.

The PHE involved soil gas and outdoor air sampling to determine the potential for vapor intrusion. These tests were conducted during 2009. More recently in 2014, a limited number of homes were sampled for indoor air in addition to soil gas and outdoor air. The highest incidences of potential indoor air contamination resulting from vapor intrusion were in Casal di Principe. A limited number of homes beyond this area were also potentially impacted by vapor intrusion.

Since the PHE was published in 2010, the U.S. Environmental Protection Agency (EPA) completed an extensive evaluation of PCE's toxicity. The EPA concluded that PCE's cancer potential is less than initially believed. Therefore, risks presented in in the initial PHE were overestimated. Many residences initially concluded to have unacceptable risks because of potential vapor intrusion would now be considered acceptable. The figure below illustrates the updated conclusions of the PHE.

## What if I have a question?

The Navy is committed to promptly sharing evaluated results of the PHE with all military families. At any time, should you have a question or require additional information, visit www.cnic.navy.mil/Naples/Programs/HealthAwareness/, or call the U.S. Naval Hospital Naples, Public Health at COMM 039-081-811-6457 or DNS 629-6457.