

**SUMMARY OF METHODS AND FINDINGS**

**EVALUATION OF CANCER INCIDENCE AND  
ENVIRONMENTAL EXPOSURES IN THE AREA OF  
THE NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP)  
AND GRUMMAN AEROSPACE SITES,  
BETHPAGE, NASSAU COUNTY, NEW YORK**

The New York State Department of Health (NYSDOH) conducted an evaluation of newly diagnosed cancers and potential environmental exposures in the area of the Naval Weapons Industrial Reserve Plant (NWIRP) and the Grumman Aerospace (Grumman) sites in Bethpage, Nassau County. Public officials requested the evaluation because residents were concerned over possible health effects from exposures to contaminants from the sites.

The NWIRP and Grumman sites were sites of industrial activities beginning in the 1930s (Grumman) and 1940s (NWIRP). Testing and manufacturing-related operations at both sites ended in 1998. As a result of these activities, soil and groundwater at the NWIRP site were contaminated by chlorinated volatile organic compounds (VOCs). Soil, soil vapor (air spaces within the soil) and groundwater at the Grumman site were contaminated by chlorinated VOCs and other substances. Recent testing showed that contaminants had gotten into the air beneath, and in some cases inside, several homes near the two sites. Systems put in place since the contamination was discovered have successfully reduced contaminant levels inside and beneath the homes.

### **CANCER EVALUATION**

The cancer evaluation reviewed available information for evidence of unusual cancer patterns in the area of concern.

- Community members provided the NYSDOH with information on cancers diagnosed among people who lived in the area of concern and beyond. These included a report of cancer in a resident of a home near the NWIRP site. Numbers of reported cases of brain tumors and a rare type of cancer reported to the NYSDOH appeared unusual, but these reports could not be confirmed. Breast cancers appeared to make up an unusually high proportion of the total cancers reported, but the number of breast cancer cases was not unusual given the number of people living in the area.

This information gave no evidence of unusual patterns of cancer occurrence unique to the area of concern.

## ENVIRONMENTAL EVALUATION

Air inside and beneath 15 homes near the NWIRP site was collected and tested for contaminants in 2009. Air inside and beneath eight homes near the Grumman site was sampled in 2007 and 2008. The environmental evaluation reviewed the results of the sampling to determine whether people might have come into contact with unusual levels of contaminants related to the sites. The evaluation also considered what was known about the characteristics of any exposures.

- Four homes near the NWIRP site had levels of the chlorinated VOC trichloroethene (TCE) in the indoor air that were above the NYSDOH guideline of 5 micrograms per cubic meter of air. The chlorinated VOCs tetrachloroethene (PCE) and 1,1,1-trichloroethane (TCA) were found in five other homes; the levels of these chemicals *inside* these homes were similar to levels found in other homes in New York State, however two of the homes had levels of VOCs in the air *beneath* the home that represented a significant potential for exposure in the future. A total of six homes had chlorinated VOC levels in the air inside and/or beneath the home where measures to reduce or prevent human exposure were recommended. All of the homes where VOCs were found were on the same block.
- None of the eight homes tested near the Grumman site had levels of TCE above the NYSDOH guideline or levels of other site-related contaminants above levels found in other homes in New York State. Soil vapor contaminated with TCE was found beneath three homes. Levels at one of these homes required continued monitoring to make sure the air inside the home was not affected in the future.
- All the measurements were from one point in time. It is not possible to know when exposures began, what the contaminant levels were in the past, or if there might have been exposures at other homes in the past.

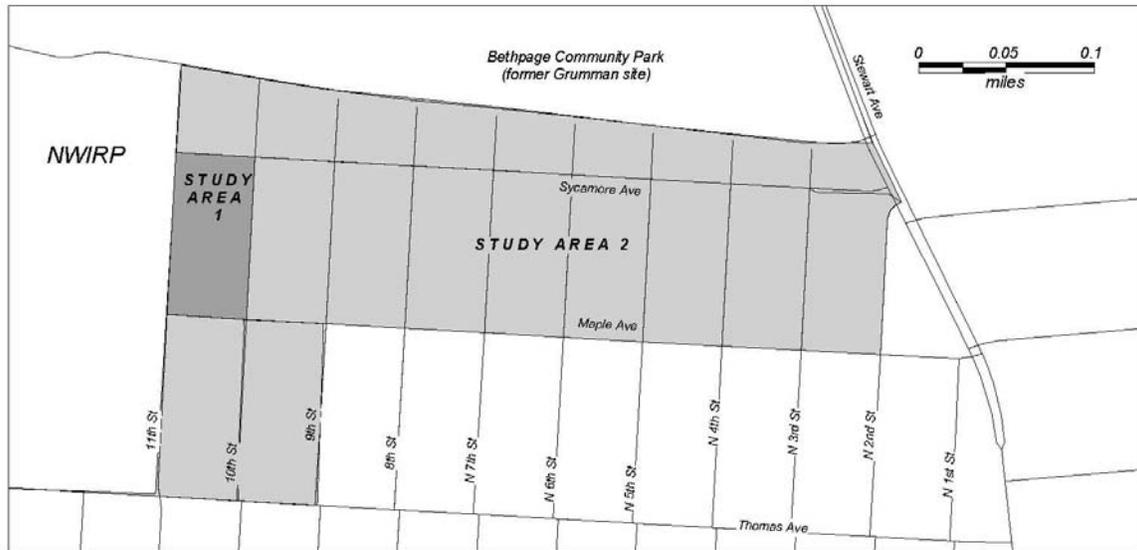
It was concluded that further investigation was indicated on the basis of the finding of completed exposure pathways in the one-block area near the NWIRP site.

## ADDRESS-SPECIFIC CANCER REVIEW

The cancer review included two study areas. Study area 1 is the one-block area where some homes had documented exposures to VOCs associated with the NWIRP site. Study area 2 is made up of 19 blocks not including Study area 1. These blocks are either next to Study area 1 or next to or including blocks where contaminants associated with the Grumman site were detected in the air beneath homes (see map on next page).

The New York State Cancer Registry was used to identify all people who had been diagnosed with cancer while they were living in either of the study areas. The Cancer Registry collects reports on all persons diagnosed with cancer in New York, as required by law. The Registry is considered complete on a statewide basis beginning with cancers diagnosed in 1976. Information

from the Cancer Registry was examined to see if there were any unusual patterns in the cancers identified in residents of these areas.



- There were seven tumors identified among residents of **Study area 1** that were diagnosed since 1976. The cancers were all of different types, including the types that occur most often in adults. The cancers identified included some of the many types that have been linked or possibly linked with exposures to TCE and/or PCE. The types of cancer identified showed no clear relation with the results of environmental sampling for the homes. None of the residents with cancer were children, but none were over age 55 at the time they were diagnosed. The total number of cancers identified among residents of the block was similar to the number expected.
- There were 93 tumors identified among residents of **Study area 2** that were diagnosed in the 34 years between 1976 and 2009. As seen in most communities, the number of cancers diagnosed in any one year increased gradually during this time period. There were 22 different types of cancer. The most frequently diagnosed types of cancer were cancers of the lung (12 cases), female breast (11 cases), and prostate (11 cases). These are the types that are diagnosed most frequently among adults. There were some rare types of cancer, but there was no more than one case of any one rare cancer. The types of cancers identified included types that have been linked with exposures to TCE and PCE, although these cancers have many other known and possible causes. For the small number of homes that had been sampled, the types of cancer identified among residents of the home showed no clear relation with the results of environmental sampling for that home. The majority (86%) of people diagnosed with cancer were age 55 or older at the time their cancer was diagnosed. The total number of cancers identified was similar to the approximate number expected.

## DISCUSSION

- Cancer is a common disease, more common than many people realize. It is not a single disease, but a collection of many different diseases, each with its own occurrence patterns, effective treatments, outlooks and risk factors. Although cancer can occur in younger people, it is primarily a disease of the middle-aged and elderly.
- The present study was done to determine whether the characteristics of the cancers diagnosed among residents of the area of concern were unusual. Unusual patterns of cancer may include 1) an unusually large number of cases of the same kind of cancer; 2) two or more cases of the same particularly rare cancer; 3) cancers occurring in people of ages where that cancer is not typically seen; or 4) many cases in a short time period (one or two years).
- For any substance in the environment to have an effect on human health, people have to come into contact with it. This is known as exposure. People may be exposed to a chemical substance by breathing it in, consuming it in food or water, or getting it on their skin. The risk of developing cancer upon exposure to a cancer-causing substance depends on how people are exposed to it, the amount of the substance to which they are exposed, the length of time over which they are exposed, and how often they are exposed.
- Of the contaminants related to the two sites, TCE and PCE have been classified as probable human carcinogens. In humans, exposures to TCE have been associated with cancer of the liver and bile duct, kidney cancer, non-Hodgkin lymphoma, and cancer of the esophagus. Cancers associated with exposures to PCE in humans include cancers of the esophagus and bladder, and non-Hodgkin lymphoma. PCE may also possibly be associated with cancers of the cervix, tongue, and lung. Evidence regarding the carcinogenicity of TCA is less strong than the evidence for the carcinogenicity of TCE and PCE.

## CONCLUSIONS

The only thing unusual about the cancers occurring in the one-block area, defined as Study area 1, where elevated levels of contaminants related to the NWIRP site had been found in indoor air, was the relatively young average age of the people affected. Due to the limited size of this one-block area, however, these results do not provide a clear indication of an unusual pattern of cancers.

For the larger area near the NWIRP and Grumman sites, Study area 2, where no exposures were found at the time of the sampling but exposure might have occurred in the past, cancer patterns were not unusual.

*For more information on the cancer evaluation or cancer in general, please contact Ms. Aura Weinstein, Director, Cancer Surveillance Program, at (518) 473-7817. For more information on the environmental evaluation, please contact Mr. Steve Karpinski of the Bureau of Environmental Exposure Investigation at (518) 402-7880.*

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