



---

Information Sheet

December 15, 2010

## **Public Health Consultation**

### **Health Statistics Review: Birth Outcomes and Cancer**

#### **Hopewell Precision Contamination Site, Hamlet of Hopewell Junction, Dutchess County, New York**

##### **Background**

The New York State Department of Health (NYS DOH) conducted a review of health data to address concerns about environmental health issues related to the Hopewell Precision Contamination Site in the Hamlet of Hopewell Junction, Dutchess County, New York. This type of review looks at levels of health outcomes for a specific area and provides residents with information about outcomes in their area compared to statewide data. It is important to note that this type of review cannot link cause (exposure) and effect (health outcome) and cannot prove that an individual person's health problem was caused by an environmental exposure from this site.

As a result of activities at the Hopewell Precision facility, groundwater in the area is contaminated with volatile organic compounds (VOCs), primarily trichloroethene (TCE) and 1,1,1-trichloroethane (1,1,1-TCA). Some residents in this area were exposed to VOCs via drinking water from private wells and contaminated indoor air through a pathway known as soil vapor intrusion. Because some studies have found that VOC exposures are associated with several types of cancer and reproductive effects, this health statistics review focuses on these outcomes, including low birth weight and prematurity, birth defects, and cancer. This type of review is feasible because NYS DOH collects comprehensive data on these health outcomes for all NYS residents. While there are other health effects of interest potentially associated with VOC exposures (for example, autoimmune or neurological outcomes), incorporating these outcomes in this health statistics review is not feasible because comprehensive statewide data are not available for these outcomes.

This health statistics review of birth outcomes and cancer uses data from birth certificates, the NYS Congenital Malformations Registry, and the NYS Cancer Registry to find out whether health outcomes in the study area are occurring at a higher, lower, or about the same level compared to statewide levels (excluding New York City), after taking into account factors such as the age of individuals within the community. While this health statistics review cannot prove that VOC contamination from the Hopewell Precision Contamination site is causing cancer or

birth outcomes in the area, it can generate hypotheses and may indicate whether further detailed health investigations are warranted.

The study area boundaries for this review were selected by identifying the U.S. Census blocks that include the Hopewell Precision groundwater contamination plume. Study area boundaries were presented to members of the community for their input and to ensure that the study area included the population with the greatest likelihood of exposures. (See attached map.)

### **Birth Outcome Review**

This review evaluated whether the occurrence of preterm births (births before 37 weeks gestation), low birth weight (less than five pounds eight ounces), or small for gestational age births (a measure of poor fetal growth), and birth defects among residents of the Hopewell Precision study area was greater than expected when compared to the occurrence in the rest of NYS, exclusive of New York City (NYC). (Gestational age and gestation refer to the length of the time the mother was pregnant.)

#### **Preterm, Low Birth Weight, Small for Gestational Age Births**

- ◆ Birth weight and length of pregnancy for babies born to women residing in the study area from 1983 through 2005 were compared to the birth weight and length of pregnancy for babies born to women in NYS, excluding NYC.
- ◆ The numbers of preterm births were compared to the expected numbers and found to be similar. The numbers of low birth weight births were lower than expected but were not statistically significantly lower. The number of small for gestational age births were lower than expected and this finding was statistically significant. This finding indicates that babies born in the study area were on average **not** experiencing poor fetal growth.

#### **Birth Defects**

- ◆ By law, physicians and hospitals in NYS must report birth defects diagnosed within two years of birth to the NYS DOH Congenital Malformations Registry. NYS DOH researchers evaluated Registry records for birth defects diagnosed from 1983 through 2005.
- ◆ The number of children with birth defects was compared to the expected number of children with birth defects. The expected number of children with birth defects was calculated by applying birth defect rates from NYS, exclusive of NYC.
- ◆ The number of children with birth defects (11) was similar to the number expected (10.1). There was no evidence that birth defects such as major heart defects or cleft palate, birth defects found to be elevated in other studies of VOC exposures, were elevated in the study area.

## **Cancer Incidence Review**

The review investigated whether the number of cancers among residents of the study area was unusual. Total cancers and eleven categories of cancer, including the most common types and groups of the more rare types, were examined.

- ◆ By law, hospitals and physicians in NYS must report all cases of cancer that come under their care to the NYS DOH Cancer Registry. NYS DOH researchers evaluated Cancer Registry records for the years 1980 through 2005 for persons residing in the study area.
- ◆ The numbers of newly diagnosed cancer cases, grouped by sex and cancer location in the body, were compared to the expected numbers of newly diagnosed cancer cases.
- ◆ Overall, the total numbers of cancers for males and for females were similar to the numbers of cancers expected based on rates from NYS, exclusive of NYC.
- ◆ When specific types of cancer were examined, the observed numbers were very similar to the expected numbers for eight of eleven categories examined. For two types, esophagus and stomach cancer, the observed numbers were elevated compared to expected numbers, but the numbers were very small and the findings were not statistically significant.

## **Follow-up Geographic Analyses**

In response to public comments, NYS DOH conducted additional analyses of cancer with respect to distance from both the Hopewell Precision site and the area of groundwater contamination. We compared the location of households where an individual was diagnosed with cancer to the location of households without a diagnosis of cancer. By comparing these locations, we could determine if there was an unusual spatial pattern of households with cancer diagnoses.

- ◆ No statistically significant difference is observed between households with a cancer diagnosis and households without a cancer diagnosis with respect to distance from either the Hopewell Precision site or the area of groundwater contamination.

## **Limitations**

The small population size and small number of observed outcomes limit this review's ability to detect excesses in health outcomes for most types of birth outcomes and specific types of cancer. Additional limitations include the lack of complete information about levels of VOCs in individual homes, the duration of the exposure, the amount of time residents spent in the home each day, the possibility of other exposure pathways, or additional exposures. This type of review cannot take into account personal information that may be related to the health outcomes, such as medical history, dietary and lifestyle choices (e.g., smoking and drinking), and occupational exposures to other chemicals. An additional limitation is that cancer and birth outcomes are the only types of health outcomes for which data were available for inclusion in this type of review.

## Recommendations

With the limitations of this review in mind, NYS DOH and the Agency for Toxic Substances and Disease Registry (ATSDR) make the following recommendations for next steps:

- ◆ Include the Hopewell Precision study area in the combined health statistics review currently being conducted for several other smaller sites in NYS with similar VOC exposures. The larger combined review may be able to draw stronger conclusions than this review because there will be a larger population, with higher numbers of birth outcomes, birth defects, and cancers expected.
- ◆ Work with area residents to address additional health concerns not included in this review. This effort includes learning more details from the community about other types of health concerns and addressing such concerns by developing a follow-up plan jointly with interested residents. This process may involve working with other agencies, consulting additional experts, and further study, if feasible.

*For copies of the full report and for additional information, please contact Mr. James Bowers, NYS DOH, Bureau of Environmental & Occupational Epidemiology, 1-800-458-1158, ext 27950.*

Map of the Hopewell Precision Study Area, Hamlet of Hopewell Junction, Dutchess County, NY

