

# Health Consultation

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CHESAPEAKE PRODUCTS SITE

CHESAPEAKE, CHESAPEAKE COUNTY, VIRGINIA

EPA FACILITY ID: VAN000306156

NOVEMBER 27, 2006

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Public Health Service  
Agency for Toxic Substances and Disease Registry  
Division of Health Assessment and Consultation  
Atlanta, Georgia 30333

HEALTH CONSULTATION

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Prepared by:

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## **Foreword**

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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## Summary and Statement of Issues

The Chesapeake Products Site (CPS) in Chesapeake, Virginia, operated as a fertilizer manufacturing plant from 1876 to 2000. On-site operations involved the use and storage of hazardous and non-hazardous substances (e.g., sulfuric acid, nitrogen-, phosphorus-, and potassium-based fertilizer, micro-nutrient fertilizer, petroleum) at the facility. A review of historical aerial photographs and fire insurance maps revealed that the facility has undergone a number of changes with regard to buildings and aboveground storage tank locations, specifically in the south central and southwestern portions of the property.

In 2003, Bay Environmental, Inc. (BEI) performed an environmental assessment which included both soil and groundwater sampling. This assessment identified the media contaminated with both volatile organic compounds, petroleum products, heavy metals, pesticides and water acidity, all in excess of Virginia standards (1). The sampling results indicated the presence of petroleum hydrocarbons and inorganic compounds in surface soil above screening levels. Concentrations of lead were reported to be above 1,000 parts per million (ppm) in six of 13 surface soil samples. The ultimate conclusion of the BEI assessment was that lead in soil and groundwater was of greatest concern at the site (1).

The Virginia Department of Environmental Quality in January 2005 requested EPA assistance as the site was considered abandoned yet contained piles of unknown materials. The neighboring property was considering purchasing the area and during their investigations, had found high levels of contamination (2).

In April 2005, the US Environmental Protection Agency (EPA) and its contractors performed a removal site assessment collecting 10 surface soil samples and 20 waste pile samples from various areas throughout the site. Samples were analyzed for Resource Conservation and Recovery Act (RCRA) metals, pesticides, and polychlorinated biphenyls, all of which were identified as contaminants of concern to the EPA.

In July 2005, the ATSDR Region 3 office received the results of the April 2005 sampling and determined the potential public health significance of metals found in soil and waste pile samples from the Chesapeake Products Site, Chesapeake, VA. Based on surface soil and waste pile sample results from the Chesapeake Products Site, ATSDR supported exposure mitigating actions (e.g. removal) at the Chesapeake Products Site. Moreover, the agency recommended that if the site is ever developed for residential use then a re-evaluation of environmental conditions and exposure pathways would be necessary. ATSDR also recommended that further sampling be conducted to fully delineate the nature and extent of contamination if the site is re-occupied (3).

On February 23, 2006, EPA conducted a site visit and noted evidence (including graffiti, access points in the fence, and foot prints) that children and other trespassers were accessing the site (4). The EPA has been informed by local response agencies in the Chesapeake area that the adjacent property on the southern border of CPS, currently undeveloped, is to be developed into a multi-family residential community (1). Therefore, EPA Region 3 asked ATSDR to determine the public health significance of chemicals found in soil and waste pile samples from the Chesapeake Products Site and if the detected levels warrant a removal action under current site

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conditions. Although the ATSDR regional office responded to the request via an ATSDR Record of Activity (4), the EPA requested input from ATSDR Headquarters.

## **Background**

### **Site Description and History**

CPS occupies about 7.6 acres in Chesapeake, Virginia and is adjacent to the southern branch of the Elizabeth River and near the confluence of the Elizabeth and James Rivers. North of CPS is a cement production plant, to the east is additional industrial zoned properties, railroad lines and US Interstate 464. To the south and west lie additional open spaces, rail lines, bridges, and the US Naval Ship Yards (1).

Chesapeake Products produced fertilizers for over 100 years. The site has multiple buildings used for storage as well as waste storage facilities including above ground storage tanks. Some of these buildings date from the company's beginning and are considered physical hazards. Although the site is mostly surrounded by a chain link fence, access is not restricted along the southwest corner where waste piles exist (1).

The site owners (principle responsible party, PRP) presented an engineering report to the city who ultimately determined the Chesapeake Products site was not suitable for occupancy and issued a notice shutting down operations (1).

Consequently, EPA and its contractors initiated removal activities in March 2006, after consulting with ATSDR regarding the agency concurrence on the need for removal.

### **Demographics**

Based on information received from the EPA, the nearest residence is about 1/3 mile to the east and is considered upgradient from the site. Furthermore, the population, derived from the information the EPA has, indicates that about 545 people live within 0.5 miles of the site. The ATSDR Geographical Information Systems developed additional population information and that map is depicted in Figure 1.

Within one mile of the site, the population is about 7200, of which 3200 are White, 3700 Black, and the remaining population consisting of American Indians, Native Americans Hawaiians, Asians, Hispanics, or other races. Included in this population are about 1,700 women of child-bearing age and about 900 children below the age of 6. These women and children comprise the population at greatest risk from exposure to the contaminants of concern identified at this site.

### **Community Health Concerns**

No health concerns have been relayed to ATSDR from the community. However, the Chesapeake City Fire Chief raised concerns to EPA regarding potential exposures to chemicals in air/smoke for firefighters and downwind residents from burning structures and waste piles in the event of a fire (4).

### **Discussion**

The area investigated consists of the former sulfuric acid aboveground storage tank (AST) area and several structures used for blending and storing fertilizer, fertilizer mixtures, and raw materials. Two 30,000-gallon sulfuric acid tanks were removed in 2002 with the tank farm area

remaining. The storage structures house fertilizer materials, either loose or in large wooden storage bins. The waste piles (2 to 20 cubic yards) appear to be comprised of soil, micronutrient solids, and fertilizer mixtures (3).

Recent activities consisted of both discreet and composite sampling. Nine discreet samples were evaluated for volatile and semi-volatile organic compounds (VOC, SVOC), pesticides, metals, PCBs, and cyanide; whereas, the one composite sample was sampled for all but the VOCs (1). The EPA reports that the VOC levels in the collected soil samples were below their risk-based concentrations. The compounds exceeding the EPA limits included benzo(a)pyrene, arsenic, copper, lead, and zinc. These results are presented in Table 1 with the EPA risk-based concentration limits (RBCs) for residential soil as well as ATSDR Minimum Risk Levels (MRLs). The MRL values are an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse noncancer health effects. It is important to note that the MRL values are not intended to define clean up or action levels for ATSDR or other Agencies.

**Table 1: Concentration Ranges for On-site Surface Soil and Waste Pile Sampling Results\***

Compound	Concentration range at 0 to 1 foot (parts per million)	EPA Residential Risk-based Concentration	ATSDR Minimum Risk Level	Is estimated exposure dose above CV for trespasser scenario?***
Arsenic	19 - 94.5	0.43 ppm	20	Yes
Copper	4,110 – 307,000	3,100 ppm	500	Yes
Lead	129 - 2,650	400-500 ppm in soil is generally used by EPA as a residential clean-up level	blood lead levels used to evaluate public health	No
Zinc	17,400 - >129,000	23,000 ppm	20,000	Yes
Benzo(a)pyrene	670-940	0.022 ppm	0.1 ppm (CREG) <sup>†</sup>	Above 10E-04 cancer risk

\*Data derived from Tables 2 and 4 as presented in Draft Trip Report for the Chesapeake Products Site Chesapeake, Chesapeake, County, Virginia (1).

\*\*Estimated exposure dose calculated using maximum reported concentration with child default exposure parameters (16 kg body weight, 200 mg soil/ day; 100 days exposure/year for 6 years).

†Cancer Risk Evaluation Guide for a 1 in a million ( $1 \times 10^{-6}$ ) excess cancer risk.

Of the results presented in Table 1, all contaminants exceed the EPA RBCs and ATSDR MRL concentrations. Estimated exposure doses from incidental ingestion of soil for a child trespasser scenario for arsenic ( $3.2 \times 10^{-4}$  mg/kg/d), copper (1.1 mg/kg/d), and zinc (0.44 mg/kg/d) were above their respective CVs.

Therefore, ATSDR has determined that the levels of contaminants found at the Chesapeake Products Site represent a potential public health hazard to trespassers and unsupervised visitors as well as routine workers at the site.

As stated in the concerns section of this document, the Chesapeake Fire Department raised concerns of potential exposures to firefighters. The metal contaminants at this site are not flammable or pyrophoric. However, they may become airborne during a fire event and firefighters should use the appropriate respiratory protection. Based on the reported concentrations of chemicals, nearby residents should shelter in-place in the event of a fire.

## **Child Health Considerations**

In communities faced with air, water, or food contamination, the many physical differences between children and adults demand special emphasis. Children could be at greater risk than are adults from certain kinds of exposure to hazardous substances. Children play outdoors and sometimes engage in hand-to-mouth behaviors that increase their exposure potential. Children are shorter than are adults; this means they breathe dust, soil, and vapors close to the ground. A child's lower body weight and higher intake rate results in a greater dose of hazardous substance per unit of body weight. If toxic exposure levels are high enough during critical growth stages, the developing body systems of children can sustain permanent damage. Finally, children are dependent on adults for access to housing, for access to medical care, and for risk identification. Thus adults need as much information as possible to make informed decisions regarding their children's health.

## **Conclusions**

Based on surface soil and waste pile sample results from the Chesapeake Products Site, current site conditions, residential development of the adjacent property, and recent evidence of children (trespassers) accessing the site, ATSDR considers exposure to chemicals at this site a public health hazard. The concentrations of arsenic, copper, lead, zinc, and benzo(a)pyrene exceed EPA established risk values, ATSDR Minimum Risk Levels and health-based comparison values. Therefore, actions should be implemented to mitigate exposure conditions.

## **Recommendations**

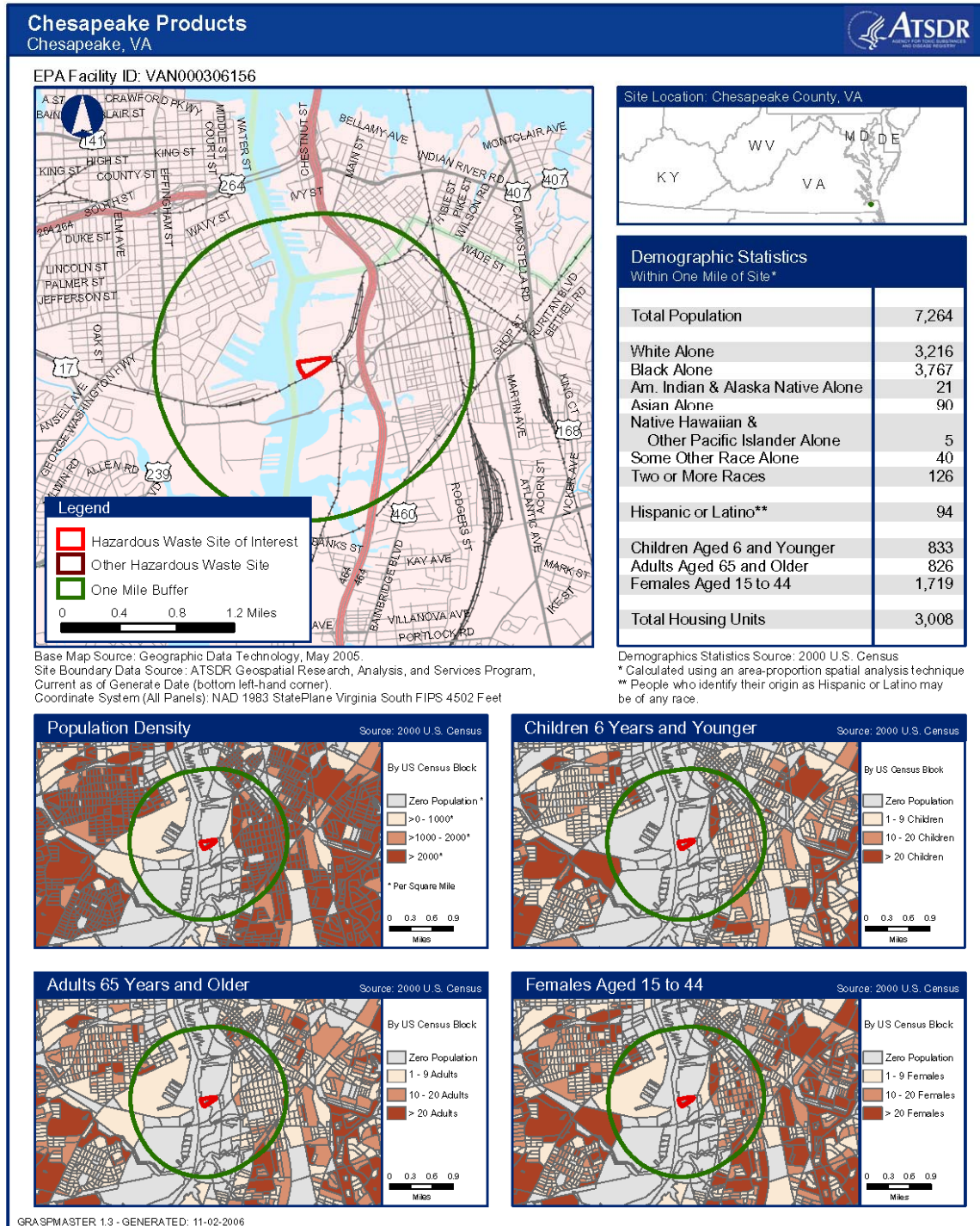
1. ATSDR agrees with EPA's assessment and recommends removal actions to mitigate exposure conditions at the Chesapeake Products Site, Chesapeake, Virginia.
2. During a fire event, ATSDR recommends that the fire department use the typical/appropriate respiratory protection.

During a fire event, ATSDR recommends that the community be notified to shelter in place until notified by the local authorities.

## **Public Health Action Plan**

No further actions are planned at this time once removal activities have been completed.





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## References

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1. Tetra Tech EM, Inc. (2006). Draft Trip Report for the Chesapeake Products Site Chesapeake, Chesapeake, County, Virginia. Prepared for U.S. Environmental Protection Agency Region 3 1650 Arch Street Philadelphia, Pennsylvania 19103.
2. USEPA Polrep #001. Chesapeake Products, Inc. Site. 100 Ohio Street Chesapeake County, VA 23322. March 30, 2005.
3. ATSDR Record of Activity dated June 28, 2005, to Nicolas Brescia, EPA On-Scene Coordinator from ATSDR Region 3, Philadelphia
4. ATSDR Record of Activity dated February 28, 2006, to Bob Guarni, EPA On-Scene Coordinator from ATSDR Region 3, Philadelphia.