

Health Consultation

WAYMART SPILL SITE

WAYMART BOROUGH, WAYNE COUNTY, PENNSYLVANIA

SEPTEMBER 30, 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: A Note of Explanation

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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HEALTH CONSULTATION

WAYMART SPILL SITE

WAYMART BOROUGH, WAYNE COUNTY, PENNSYLVANIA

Prepared By:

Pennsylvania Department of Health
Under Cooperative Agreement with the
U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry

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Executive Summary

At the request of a concerned community member, the Pennsylvania Department of Health (PADOH) prepared this health consultation to determine if residents near the Waymart Spill Site, also known as the Waymart C-Store, were exposed to volatile organic compounds (VOCs) in their private wells at levels that would harm their health. The PADOH worked under a cooperative agreement with the Agency of Toxic Substances and Disease Registry (ATSDR) to complete this health consultation document.

PADOH and ATSDR have determined that the Waymart Spill Site currently represents *no apparent public health hazard*. Based on the residential well data provided, we do not expect adverse health effects from exposure to any of the levels of chemicals detected in the private wells near the Waymart Spill Site. Drinking water concentrations of benzene in the homes were further evaluated since levels of these contaminants were detected above health-based comparison values for this chemical. After consideration of site-specific conditions and the available scientific literature, we believe that current exposures to the detected levels of VOCs in residential wells in the vicinity of this site are unlikely to cause adverse health effects.

PADOH and ATSDR have also determined that the Waymart Spill site represents an *indeterminate public health hazard* for future exposures to VOCs in groundwater through ingestion of contaminated drinking water. The site characterization reports reviewed in this report did not delineate the extent of the groundwater contamination plume vertically and then horizontally in the deeper aquifer. Further site characterization through groundwater monitoring and sampling is required to identify residents that are potentially exposed to contaminated drinking water via their private well.

Additionally, steps were immediately taken to mitigate or eliminate exposures to the potentially impacted potable water supplies in the vicinity of the site. The potentially responsible party temporarily provided residents near the site with bottled water until a whole-house carbon filtration system was placed on their wells. All nearby residents that had VOCs detected in their private wells were also eventually offered to connect to a municipal water supply. Some residents that rejected the offer to connect to the municipal water supply elected to have whole house filtration systems installed on their private wells to mitigate their exposure to detected contamination. *After reviewing the sampling data provided, both methods were effective in mitigating (homes with filters) or eliminating (homes with public water) the exposure to the contaminated groundwater near the site.*

The interpretation, conclusions, and recommendations regarding the Waymart Spill Site for this health consultation are site-specific and do not necessarily apply to any other site.

Background and Statement of Issues

Site Description and History

The Waymart Spill Site (the site), also known as the Waymart C-Store Site, is located in Waymart Borough, Wayne County, Pennsylvania (Figures 1- 4). The site is located on the northeast corner of the intersection of Route 6 and 296. Undeveloped woodlands are located to the north and east of the site, Route 6 and residential dwellings to the south, and Route 296 and commercial properties to the west surround the site.

In May 1998, workers from the Pennsylvania Department of Transportation discovered gasoline odors in subsurface soils along an excavation adjacent to the site. Representatives from the Pennsylvania Department of Environmental Protection (PADEP) Northeast Regional Office (NERO) were notified and noticed strong petroleum odors in the excavation. The PADEP officials also noticed staining and obtained elevated photo-ionization detector (PID) measurements directly from the soils of the excavation. PADEP directed the potentially responsible party (PRP), Fowler Oil Company, to initiate a subsurface site characterization investigation.

The PRP hired an environmental consultant to complete a subsurface site characterization investigation and report. The environmental consultant submitted this initial subsurface site characterization report to the PADEP in December of 2004. This report indicated that shallow groundwater at the site was contaminated with volatile organic compounds that are constituents of petroleum products. The conclusions of the site characterization report indicated that the extent of the subsurface soil contamination extends southward for a distance that was not determined, but the deeper soils adjacent to the actual gasoline station property did not appear to be impacted with VOCs [1]. This environmental report also included the resultant data of the residential wells near the gasoline release. Six of these private wells were discovered to be impacted with VOCs that are also gasoline constituents.

PADEP required that the PRP initially provide bottled water to the six residential locations with the private wells that may have been impacted with detectable levels of VOCs from the release of gasoline into the environment. Since a longer-term solution was not in place to address the contamination to the residents' potable water supply, the PRP installed carbon-filtration treatment units on these private wells. A permanent solution was, subsequently, not reached to address the VOC contamination in these wells, thus the PRP offered these affected residents a connection to the public water supply for the Borough of Waymart. Some residents declined the hook-up to the public water supply and elected to have the PRP maintain their carbon filter water treatment systems on their private wells.

Site Visits

In June 2005, a representative of the PADOH Health Assessment Program viewed the site with the PADEP Project Officer. The location of the gasoline contamination plume was discussed, as well as the results of the site characterization. PADOH staff took notes and

discussed site background information with the PADEP Project Officer. During this visit, PADOH met, individually, with residents at several properties near the site.

Sample Events

From August 1998 through June 2001, twenty shallow groundwater-monitoring wells and a deeper bedrock well were installed at the Waymart Spill Site [1]. At least one soil sample was also collected from each soil boring from the construction of the wells. During this time, the groundwater monitoring wells, along with approximately six residential wells in proximity to the site, were sampled for volatile organic compounds, more specifically gasoline-constituent compounds and lead.

Sample Results

Benzene, toluene, methyl tertiary butyl ether (MTBE), and other VOCs were detected in the residential wells of residences near the Waymart Spill Site [1]. Benzene was detected at a maximum concentration of 6.87 parts per billion (ppb) in one residential well. MTBE was detected at a maximum concentration of 83 ppb in another well. The maximum detectable concentrations of some other VOCs in residential wells were as follows: acetone 6 ppb, toluene 4.26 ppb, and naphthalene 1.23 ppb. Lead was also detected in two residential wells at a maximum concentration of 6.39 ppb. In this health consultation, PADOH evaluated these potable water sampling data and determined the public health significance of the data.

Since human exposure does not occur to the groundwater sampled from the on-site monitoring wells, the levels of VOCs detected in these wells were not evaluated as part of this health consultation. Furthermore, all but one of the on-site monitoring wells used for the characterization of the release was constructed to represent the groundwater of the shallow groundwater source. The private wells in this area utilize a deeper aquifer and nearby residents, currently, are not expected to be exposed to contaminants in the aquifer sampled in the shallow monitoring wells.

Quality Assurance and Quality Control

In preparing this health consultation, ATSDR and PADOH relied on the information provided in the referenced documents. ATSDR and PADOH reviewed the quality assurance and quality control measures that were followed regarding data gathering, chain-of-custody, laboratory procedures, and data reporting. ATSDR and PADOH expected and presumed that to ensure the accuracy of the data, extreme care was taken during all aspects of sample collection. ATSDR and PADOH also assumed that the laboratory only used certified, clean-sample collection devices. Once samples were collected, ATSDR and PADOH expected they were stored according to the method protocol and were delivered to the analytical laboratory as soon as possible. Finally, ATSDR and PADOH presumed that laboratory Standard Operating Procedures and other procedures and guidance for sample analysis, reporting, and

chains of custody were followed. The analyses, conclusions, and recommendations in this health consultation are valid only if the referenced documents are complete and reliable.

Discussion

In this section, PADOH evaluates the potable well data and determined whether the residents are being exposed to harmful levels of the VOCs detected in their private wells. PADOH considers how the residents came into contact with the VOCs as well as the frequency of exposure. PADOH also considers whether the contaminants were present at harmful levels.

To determine the likelihood of possible health effects of site-specific chemicals, ATSDR has developed health-based comparison values (CVs). These CVs include Minimal Risk Levels (MRLs) for non-cancerous health effects, Cancer Risk Evaluation Guides (CREGs) for cancerous health effects, and Reference Dose Media Evaluation Guides and Environmental Media Evaluation Guides (EMEGs). CREGs are comparison values based on EPA's chemical-specific cancer slope factors and an estimated lifetime cancer risk of one cancer in one million people.

ATSDR established MRLs based upon an evaluation of the toxicological literature for a given substance. MRLs are not established as thresholds of toxicity, but were developed as screening tools, below which non-cancer adverse health effects are unlikely. In that framework, a lifetime of exposure below a chronic MRL would not be expected to result in adverse health effects. However, exposure to levels above the MRL may not necessarily lead to adverse health effects. There is a wide range of uncertainty between levels known to cause adverse health effects and the MRLs. Therefore, the MRL does not establish the maximum "safe" level, nor is it intended to imply that exposure is not likely to be harmful. If environmental exposures occur at concentrations exceeding the MRL then further evaluation is necessary to determine the health risks of those exposures.

Contaminant Evaluation

At the sampled levels, potential exposures to acetone, benzene, MTBE, naphthalene, and toluene from ingestion of drinking water, were below their corresponding MRLs for chronic or intermediate exposure [2] and are not expected to cause non-cancerous effects to the residents at the maximum levels detected. Therefore, these contaminants, with the exception of benzene, will not be further addressed in this health consultation. Benzene is a known carcinogen [7], and was detected in concentrations that were in exceedance of the CREG for benzene (0.6 ppb), which necessitates further evaluation.

Benzene

Benzene is commonly found in the environment. Industrial processes are the main sources of benzene in the environment. Industrial discharge, disposal of products containing benzene, and gasoline leaks from underground storage tanks release benzene into water and soil. Benzene can also pass (volatize) into air from water, especially when water contaminated with benzene is heated during cooking or showering. Since tobacco

smoke contains high levels of benzene, tobacco smoke is another source of benzene in air. Once in the air, benzene reacts with other chemicals and breaks down within a few days [3].

The maximum concentration of benzene detected in a residential well near the site was 6.87 ppb. This level of benzene was detected in a location prior to an inline-filtration unit. These particular residents were not actually exposed to this level of benzene because the sample collected at the tap, after the filter, did not yield a detectable level of benzene. Since past residential well data for this area were not available for a worst case exposure scenario, PADOH decided to evaluate the maximum level of benzene for a most conservative approach to determine if an increased cancer risk would exist for residents exposed to this level if it had occurred.

PADOH estimates the maximum theoretical excess cancer risk for lifetime exposure to benzene at 6.87 ppb is one additional cancer per 100,000 people. This theoretical calculation is based on the assumption there is no safe level of exposure to a chemical that causes cancer. However, the theoretical calculated risk is not exact and tends to overestimate the actual risk associated with exposures that may have occurred. In addition, since the residents were not actually exposed to this level of benzene, the overall theoretical cancer risk would further decrease. Given the relatively low level of the maximum detected concentration of benzene in comparison to studies that associated benzene to leukemia, it is unlikely that the estimated exposure would result in increased cancer.

Child Health Considerations

PADOH and ATSDR recognize that infants and children are more vulnerable to chemical exposure than adults. As part of their child health considerations, PADOH and ATSDR are committed to evaluating exposure scenarios that potentially involve children. Considering exposure to private well water near the Waymart Spill Site, children may have an increased vulnerability due to many factors including:

- 1) children weigh less than adults, resulting in higher doses of chemical exposure relative to body weight;
- 2) children have higher rates of respiration;
- 3) metabolism and detoxification mechanisms differ in both the very young and very old and may increase or decrease susceptibility, and;
- 4) the developing body systems of children can sustain permanent damage if toxic exposures occur during critical growth stages.

PADOH and ATSDR considered child-specific doses in the analysis for this health consultation document.

Conclusions

1. PADOH and ATSDR conclude that the Waymart Spill Site currently poses *no apparent public health hazard* to residents that utilize private wells near the site.
2. *Past exposures* to VOCs in indoor air in the residential location in the vicinity of the site represent an *indeterminate health hazard* because historical well sampling data is not available.
3. *Future potential exposures* to VOCs via ingestion and inhalation of private well water from this site represent an *indeterminate public health hazard*. After the initial site characterization some subsurface soil and groundwater at the site remained contaminated from benzene and other fuel constituents. No remedial efforts have taken place to eliminate the current source of VOC contamination to the groundwater in the vicinity of the site.

Recommendations

1. PADOH and ATSDR recommend that PADEP ensures that further site characterization, monitoring and/or mitigating groundwater, and subsurface soils for impacts from the VOC contamination is conducted by the PRP. Specifically, it is recommended that they delineate the plume of groundwater contamination and sample residential wells potentially impacted by groundwater contamination. If the monitoring results reveal increased levels of contamination to the sampled environmental media, a future health consultation should be prepared by PADOH and ATSDR that determines the public health significance of exposures to those levels.
2. Since a connection to the public water supply was offered, PADOH and ATSDR recommend that residents connect to the municipal water supply. The municipal water supply will eliminate exposure to a water supply that could be impacted by contamination. The provider of public water is required, under the Safe Drinking Water Act, to sample and monitor the water it is providing to its consumers, and to ensure that it is not impacted with elevated levels of contamination.
3. If the residents choose to keep their water filters, PADOH recommends that their wells are sampled periodically and that their filter systems are maintained according to the manufacturer's instructions. It is the position of ATSDR and PADOH that this sampling and maintenance will ensure the best protection from contamination and functionality of the water filtration system.

Public Health Actions Completed

1. PADEP initiated the characterization at the site with special emphasis on defining the groundwater and subsurface soil contamination plume to determine if VOCs or other contaminants are present in groundwater and subsurface soils. PADOH and PADEP identified residents that were potentially exposed to contaminants through their private

wells and these exposures were addressed in this health consultation. However, further characterization of the site is needed to determine if there is the potential for additional private wells to be impacted with VOC contamination.

2. PADOH and PADEP contacted some of the residents who had their wells sampled in this health consultation and discussed the public health significance of their exposure to VOCs in their source of drinking water. PADOH and PADEP encouraged residents to hook up to the public water system to eliminate an exposure pathway that currently exists for residents utilizing their private wells. PADOH will continue to be available to answer residents' health questions.

Public Health Actions Planned

1. ATSDR and PADOH will make this health consultation available to the residents at the Waymart Spill Site.
2. PADOH will review and evaluate potential future environmental data requested at this site.

References

1. Pennsylvania Department of Environmental Protection, Northeast Regional Office. Subsurface Site Characterization. Fowler Shell. Waymart Borough, Wayne County, Pennsylvania. PADEP Facility ID #64-08989. December 22, 2004.
2. Agency for Toxic Substances and Disease Registry. Minimal Risk Levels (MRLs) for Hazardous Substances. Atlanta, GA: DHHS, U.S. Public Health Service, Available at: <http://www.ATSDR.cdc.gov/mrls.html>. Last Accessed July 20, 2006.
3. Agency for Toxic Substances and Disease Registry. Toxicological Profile for Benzene. Atlanta, GA: DHHS, U.S. Public Health Service, ATSDR 2005 (Update).

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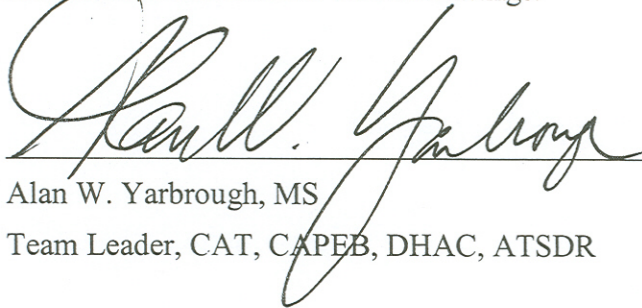
Certification

This health consultation for the Waymart Spill Site was prepared by the PADOH under a cooperative agreement with the ATSDR. It is in accordance with approved methodology and procedures existing at the time the health consultation was initiated. Editorial review was completed by the cooperative agreement partner.



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The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this health consultation and concurs with its findings.



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Appendix A

Table

TABLE 1. SUMMARY OF MAXIMUM CONCENTRATION OF COMPOUNDS IN SIX PRIVATE WELLS NEAR THE WAYMART SPILL SITE (All units are in ppb)

compound	Pre-filtered Samples	Intermediate Samples (At filter)	Post-filtered Samples (Final Treated)	Health-based comparison value (CV)	CV source
benzene	6.87	ND	ND	0.6	CREG
toluene	ND	2.63	4.26	200	Intermediate child
ethylbenzene	ND	ND	ND	700	LTHA
xylenes (total)	ND	ND	ND	2000	RMEG (child)
napthalene	ND	1.23	ND	100	LTHA
methyl t-butyl ether (MTBE)	83	10	10.1	3000	Intermdiate Child
cumene	ND	ND	ND	1000	RMEG (child)
acetone	6	ND	ND	9000	RMEG (child)

TABLE KEY

intermediate	Contact with a substance that occurs over a 14 - 365 day period
RMEG	Reference Dose Media Evaluation Guide
CREG	Cancer Risk Evaluation Guide for 1×10^{-6} excess cancer risk (ATSDR)
EMEG	Environmental Media Evaluation Guide (ATSDR)
MRL	Minimal Risk Level (ATSDR)
EPA Region III RBC	EPA Region III Risk-based Concentration Table - Ambient Air
LTHA (EPA)	Lifetime Health Advisory
ND	Chemical Not Detected in these samples

Appendix B

Figures

Figure 1. Site Location Map – Waymart C-Store, Waymart Borough, Wayne County, PA

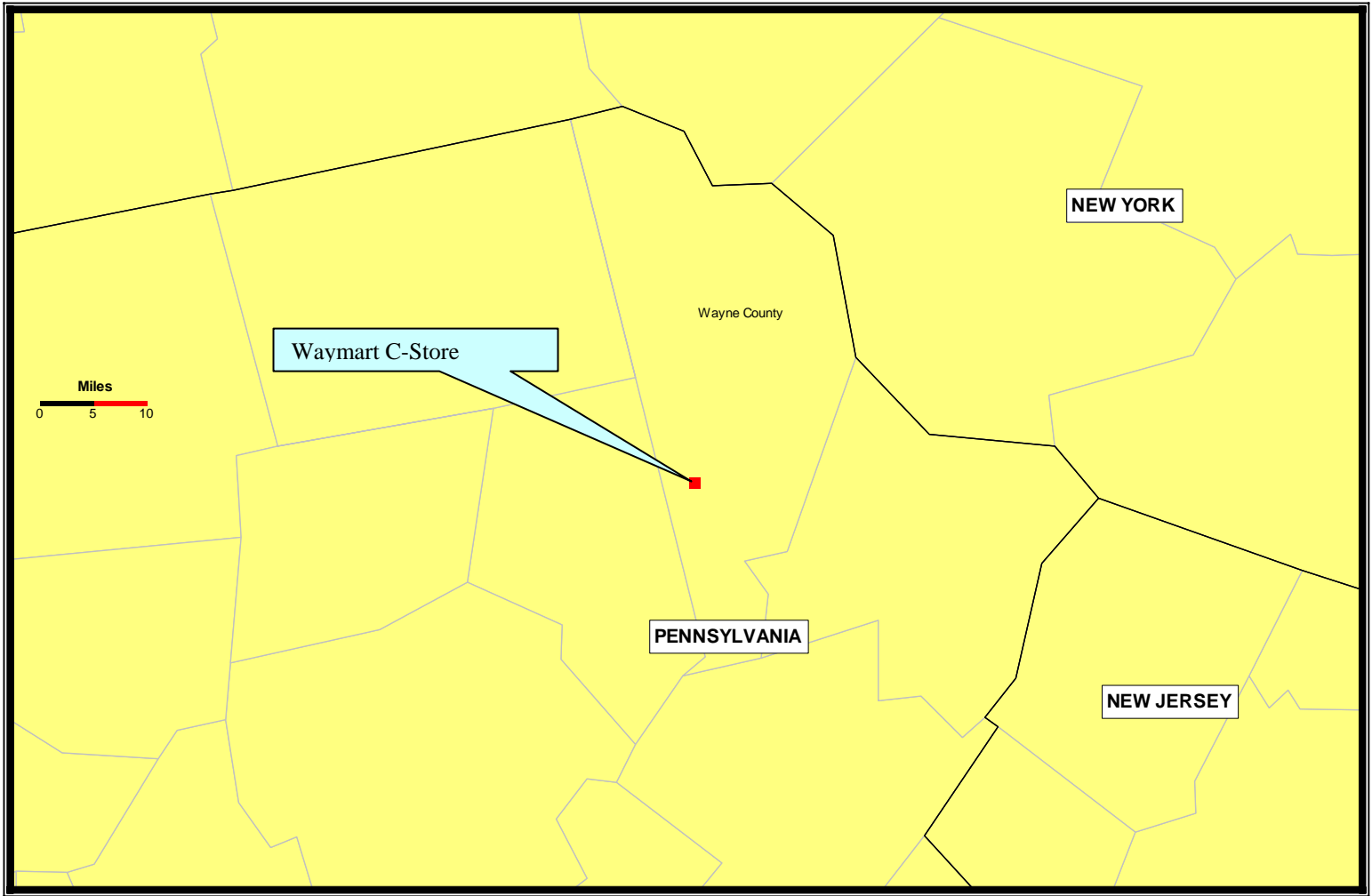
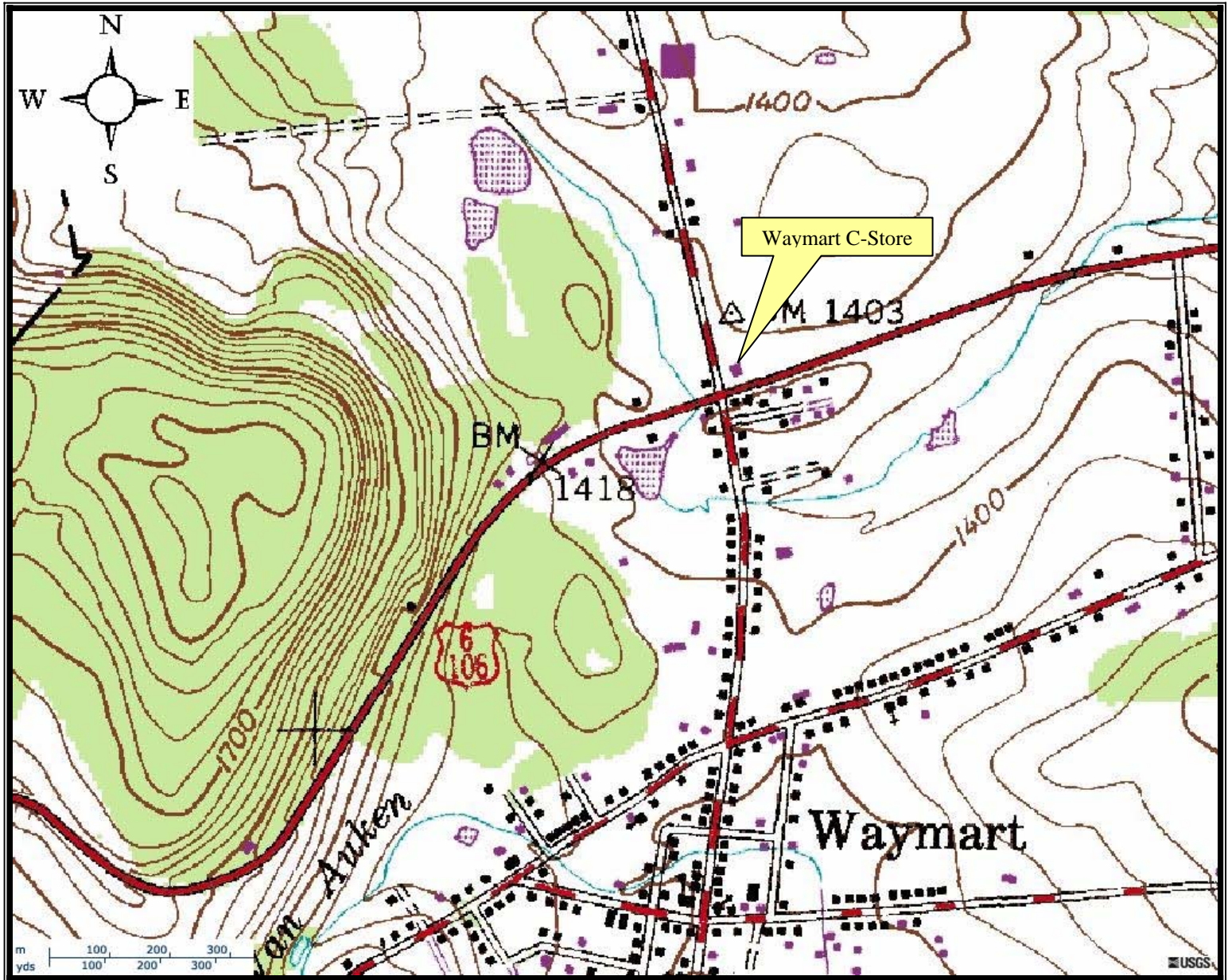


Figure 2. Site Location Topographic Map – Waymart Spill Site, Waymart Borough, Wayne County, PA



*Topographic Map Courtesy of USGS (July 1995)

Figure 3. Aerial Photograph of the Waymart Spill Site, Waymart Bourough, Wayne County, PA



*Aerial Photograph Courtesy of USGS (April 2002)