

Health Consultation

PATHAN CHEMICAL SITE

PHILADELPHIA, PHILADELPHIA COUNTY, PENNSYLVANIA

EPA FACILITY ID: PAD067399378

MARCH 8, 2005

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

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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

Summary

At the request of U.S. Environmental Protection Agency Region 3 (EPA), the Pennsylvania Department of Health (PADOH), under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), prepared this health consultation (HC #3) for the Pathan Chemical Site. The consultation's purpose is to evaluate asbestos fiber air data and any potential public health implications indicated by that data. In June 2003, air samples were collected at five locations at the Pathan site for asbestos fibers analysis.

Previously, ATSDR and PADOH completed two consecutive health consultations (HCs) that reviewed EPA sampling at the Pathan Chemical site for lead, arsenic, asbestos fibers, and polycyclic aromatic hydrocarbons. These health consultations contributed to the determination of whether the site posed a public health hazard, or whether more information was necessary to make that determination.

The site is currently a vacant lot, readily accessible to anyone. Validated analytical results for asbestos fiber air data became available from EPA in April 2004. Using the most recent data and current on-site activities, PADOH and ATSDR conclude that the site currently does not pose an asbestos fiber public health hazard.

Background and Statement of Issues

Site History

The former Pathan Chemical Site (the site), which once contained a 40,000-square foot, four-story warehouse and a loading yard, is located in a residential area at 427 Moyer Street, Philadelphia, Pennsylvania (Figure 1 and Figure 2). The building was originally a textile facility; in 1972 a former employee purchased the building and converted it into a detergent and fabric softener processing facility. From the documents gathered for this HC, there is no information as to when the business was closed [1]. In any event, after the closure the site became an abandoned, unsecured building with most of the windows and some of the doors broken out, and it showed evidence of trespass and fire.

EPA initially conducted a removal assessment in 1995. The removal assessment found that within the building approximately 10 vats, several hundred drums, and approximately 1000 small containers, all contained hazardous substances. Many of the drums and small containers were unlabeled and were in a deteriorated condition with, in some cases, their contents leaking. Materials were incompatibly stored, and sections of the floors where materials were stored were also in a deteriorated condition. The owner of the site attempted to conduct the removal effort, but for financial reasons was unable to do so. EPA filled three roll-off dumpsters with crushed drums and small containers and removed them from the site. When that removal action was completed, approximately 25 drums and several bags of chemicals remained on-site because the property owner declared them as assets. Before leaving the site in 1996, however, EPA placed these items on the third floor of the building [1].

As of August 1998, these drums and paper bags filled with chemicals still remained on site. In July 1998 the EPA Regional Response Center received information that people were breaking into the building and spilling the chemicals on the floor. This initiated another EPA removal assessment in August 1998, in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300. Some of these drums and paper bags had their contents spilled on the floor and down the stairwells, constituting a release or threat of release into the environment. These findings, together with evidence of trespassing and vandalism, created an imminent and substantial endangerment to public health and to the environment [1].

Because the building was abandoned, the integrity of the earlier removal efforts conducted in 1996 was threatened. Further removal action was required to eliminate the threat posed by the remaining drums and paper bags at the site. From November 3, 1998, through December 14, 1998, EPA removed the drums and the paper bags and cleaned up the spilled materials throughout the building [1]. Nevertheless, in March 1999 the building caught fire and was destroyed. The city of Philadelphia tore the building remnants down, leveled the site, and covered it with fill (mounded-up or crown-shaped) from an unknown source. It is possible that at least the top 1-foot layer of soil is this fill. Building remnants still on site are at about 5 feet below this fill, and the pre-existing earth might be about 10 feet below the fill.

Currently, the site is a vacant lot readily accessible to anyone. Row homes are directly adjacent to the west and east boundaries of the site. Located directly north of the site, crossing East

Thompson Street, is the Adaire Public School and the Hetzell Playground. Located directly south of the site, crossing Moyer Street, are additional row homes (Figure 3).

Site Visit

Since July 2001, when EPA first collected the soil samples, overgrown vegetation and trash has been removed, and a small tree house has been constructed at the northeast end of the site. In October 2001, officials from the PADOH Environmental Health Assessment Program, from ATSDR and EPA Region 3, from the City of Philadelphia Department of Recreation, and the City of Philadelphia Risk Management Division conducted a site visit. Since that October 2001 site visit, to minimize storm water-related fill runoff, a chain link fence has been installed along one side of the site, and a silt fence on another side. In the spring 2004, however, the site was still open to pedestrians [2].

Site Contamination

In March 2004, PADOH published air sampling data results and the most recent soil sampling data results in Pathan Chemical site HC#2 (with the exception of asbestos fibers analysis). This sampling round was the result of Pathan HC #1's recommendations for additional data. In June 2003, an EPA contractor collected five on-site air samples for asbestos fiber analysis (Figure 4). The five sampling stations were established as follows:

1. background/upwind along the site boundary (A-01 and A-02);
2. central/within the site (A-03); and
3. downwind along the site boundary (A-05 and A-06).

The air samples were analyzed for asbestos fibers using transmission electron microscopy (TEM) [3].

Discussion

To determine the possible health effects of site-specific chemicals and asbestos fibers, ATSDR has developed health-based comparison values (CVs); these are chemical-specific concentrations that help to identify environmental contaminants of health concern. PADOH uses CVs to determine which contaminants require further evaluation [4].

For asbestos fibers, these CVs include Cancer Risk Evaluation Guides (CREGs) for cancerous health effects. Usually derived from animal or occupational studies, CREGs are used to calculate the exposure dose likely to result in one excess cancer case per 1 million persons exposed over a lifetime (70 years). It is important to note that while media concentrations less than a CV are unlikely to pose a health threat, media concentrations above a CV do not necessarily represent a health threat either. Therefore, CVs are not used as predictors of adverse health effects or for setting clean-up levels.

Among other investigative methods, PADOH researches scientific literature and uses the ATSDR's Minimal Risk Levels (MRLs). MRLs are estimates of daily exposure to contaminants below which noncancerous adverse health effects are unlikely to occur; but no MRLs are

available for inhalation of asbestos fibers [4]. Also, health guidelines such as MRLs do not consider the risk of developing cancer. Thus to evaluate inhalation exposure to asbestos fibers, other sources were used, such as the ATSDR toxicological profiles and the National Institute for Occupational Safety and Health (NIOSH) [5,6].

The asbestos fibers sampling data results evaluated in this section were obtained from the 2004 data validation report [3]. PADOH evaluated the environmental and human components (or exposure pathways) that could lead to human exposure. Exposure pathways are descriptions of the way in which a chemical moves from its source (i.e., where it began) to where and how people can come into contact with (i.e., become exposed to) the chemical. As an exposure pathway, PADOH considered exposures to trespassers (mostly middle-school age children playing on-site mostly throughout the summer) to on-site soil through inhalation of asbestos fibers in surface soil (0 to 3 inches).

The previous ATSDR health consultation (HC#2) published in March 2004, concluded that particulate matter with a diameter less than or equal to 10 microns in size (PM10) sample results were insignificant. In HC#2 all samples came back below detection limits (meaning sample detection limits were below the Pennsylvania and National Ambient Air Quality Standard of 50 micrograms per cubic meter as per the Clean Air Act)[6]. Previous soil samples results for selected metals and PAHs were very low, and the PM10 sample results were below detection limits, thus in HC#2 it was not necessary to analyze air samples for selected metals or for PAHs. Asbestos fibers sampling data results, however, became available from EPA in April 2004 and these data were evaluated by PADOH for this health consultation [3].

Asbestos Air Samples

In June 2003, an EPA contractor collected five on-site air samples, which were then submitted for analysis of asbestos using TEM. The TEM analysis data for asbestos in the air samples became available in April 2004, at which time PADOH completed its evaluation for this HC. The laboratory results showed that the one analysis for one on-site sample was at the *analytical sensitivity* for the method used; the other four samples taken on-site were less than the *analytical sensitivity* [3]. The following table lists the actual analytical sensitivities and analytical results for each sample per sample location:

Table 1: Analytical Sensitivities and Analytical Results for Each Sample per Sample Location

Sampling Locations	Analytical Sensitivities (fibers / cc x 10 ⁻⁴)	Confirmed Analytical Results (fibers / cc x 10 ⁻⁴)
A-01	7.07	detection level
A-02	7.5	detection level
A-03	6.69	detection level
A-05	6.47	6.47
A-06	7.3	detection level

cc = cubic centimeters

Single asbestos fibers were detected at A-01 (4.35 microns in length) and at A-05 (6 microns in length). The numbers of fibers detected were just at the limit of detection, and the rest of the samples were below the detection limit. Only one of the asbestos fibers results was confirmed (6.47×10^{-4} fibers per cubic centimeters or cc at sampling location A-05). Additionally, fibers less than 5 microns in length are not considered when assessing potential risks - asbestos fibers of such length are not considered to have a human health impact. The larger asbestos fibers, particularly those longer than 5 microns and thinner than 0.5 microns, are thought to be more dangerous because they are more difficult for the body to expel. The confirmed result is above the ATSDR CV for asbestos fibers (4×10^{-6} fibers/cc)[4]. The ATSDR publication entitled *Toxicological Profile for Asbestos* (September 2001) states that a recent analysis of monitoring data for asbestos in ambient air worldwide estimated rural and urban levels yielded about 1×10^{-5} fibers/milliliter (basically the units are equivalent to fibers/cc) and 1×10^{-4} fibers/milliliter, respectively [5]. Therefore, the presence of about 0.0001 fibers/milliliter in urban air is not uncommon. Indoor air, as well as areas near source-dominated locations, could potentially contain even higher levels of asbestos [5]. The analytical results for the air samples measured in this HC are approximately or, at the minimum, slightly higher than background levels for urban areas.

In the most recent on-site air sampling one chrysotile asbestos showed a detection of fiber greater than 5 microns in one sample out of the five. Research shows that amphibole asbestos fibers are more harmful than chrysotile asbestos fibers, and that fibers greater than 10 microns in length pose increased health risks (compared with fibers in the 5 microns to 10 microns range). Only chrysotile was detected at the Pathan Chemical site, and none of the fiber lengths exceeded 10 microns.

Because of a lack of non-occupational asbestos fibers exposure limits, PADOH and ATSDR often use the National Institute for Occupational Safety and Health (NIOSH) limits. These are based on 8- and 10-hour occupational exposures. NIOSH has established a recommended exposure limit (REL) and a permissible exposure limit (PEL) for inhalation. These limits define the relationship between exposure doses and the likelihood of an increased risk of cancer, compared with controls that have not been exposed to the chemical. The sample results are also well below the NIOSH REL of 0.1 fiber/cc for a 400-liter air sample collected over 100 minutes, and they are far below the NIOSH PEL [6]. After evaluating the air sample data, PADOH determined that at this site, there is no apparent public health hazard for exposure to asbestos fibers by inhalation.

Child Health Considerations

ATSDR and PADOH recognize that children are especially sensitive when exposed to many contaminants. This sensitivity results from the following:

1. children are more likely to be exposed to certain media (e.g., soil, sediment, air, surface water or water from springs) because they play outdoors and have a greater tendency to put their fingers and objects in their mouths;
2. children are shorter than adults, which means they can breathe dust, soil, and vapors close to the ground; and
3. children are smaller; therefore childhood exposure results in higher doses of chemicals per body weight.

Ideally, because asbestos fibers can accumulate over a lifetime, children should especially be protected from exposure to asbestos fibers. PADOH considered the infrequent exposure — through possible inhalation of asbestos fibers in surface soil — of children on site, and the low asbestos-fiber level at the site. After reviewing the available information, PADOH determined exposures under such conditions pose no apparent public health hazard for children.

Conclusions

PADOH and ATSDR conclude that exposure to the current levels of asbestos fibers at the site is unlikely to cause health effects, due to the lack of constant exposure and to the extremely low numbers of asbestos fibers present at the site. Therefore, the site poses no apparent public health hazard.

The interpretation, advice, and recommendations provided in this HC are based on the information currently available. Additional information could alter the conclusions and recommendations in this HC. In addition, the conclusions and recommendations of this HC are specific to the Pathan Chemical Site and should not be considered applicable to any other situations or any other sites.

Recommendations

PADOH has evaluated all of the asbestos fibers sample results and there are no further recommendations.

Public Health Action Plan

ATSDR and PADOH will ensure that the City of Philadelphia, USEPA, and the community are aware of the findings of this consultation. PADOH will distribute to the residents living near the site a fact sheet containing the final conclusions about the Pathan Chemical site.

References

1. Federal on-scene coordinator's after action report for Pathan Chemical Restart. Philadelphia, PA; November 3, 1998 through December 14, 1998.
2. Lausch R. EPA Region 3 electronic mail to Jon Edelstein, Manager of Brownfield Redevelopment, Department of Commerce, City of Philadelphia. Philadelphia, PA; 2004.
3. EPA Region 3. Asbestos fiber laboratory data and data validation reports for Pathan Chemical Site sent to ATSDR and PADOH from Fredrick Foreman and Robert Lausch. Philadelphia, PA; April 2004.
4. Agency for Toxic Substance and Disease Registry. Soil/air/water comparison values and health guideline comparison values, 03-31-04 to 06-31-04. Atlanta: US Department of Health and Human Services.
5. Agency for Toxic Substance and Disease Registry. Toxicological profile for asbestos. Atlanta: US Department of Health and Human Services; 2001. Available at: <http://www.atsdr.cdc.gov/toxprofiles/tp61.html>. Last accessed 18 January 2005.
6. US Department of Health and Human Services. NIOSH pocket guide to chemical hazards. Washington DC; February 2004.

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Certification

This Health Consultation for the Pathan Chemical Site was prepared by the Pennsylvania Department of Health under a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was initiated.

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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 – Figures

Figure 1
Map of the Commonwealth of Pennsylvania
Showing the Site Location of Pathan Chemical Site
427 Moyer Street
Philadelphia, PA 19125

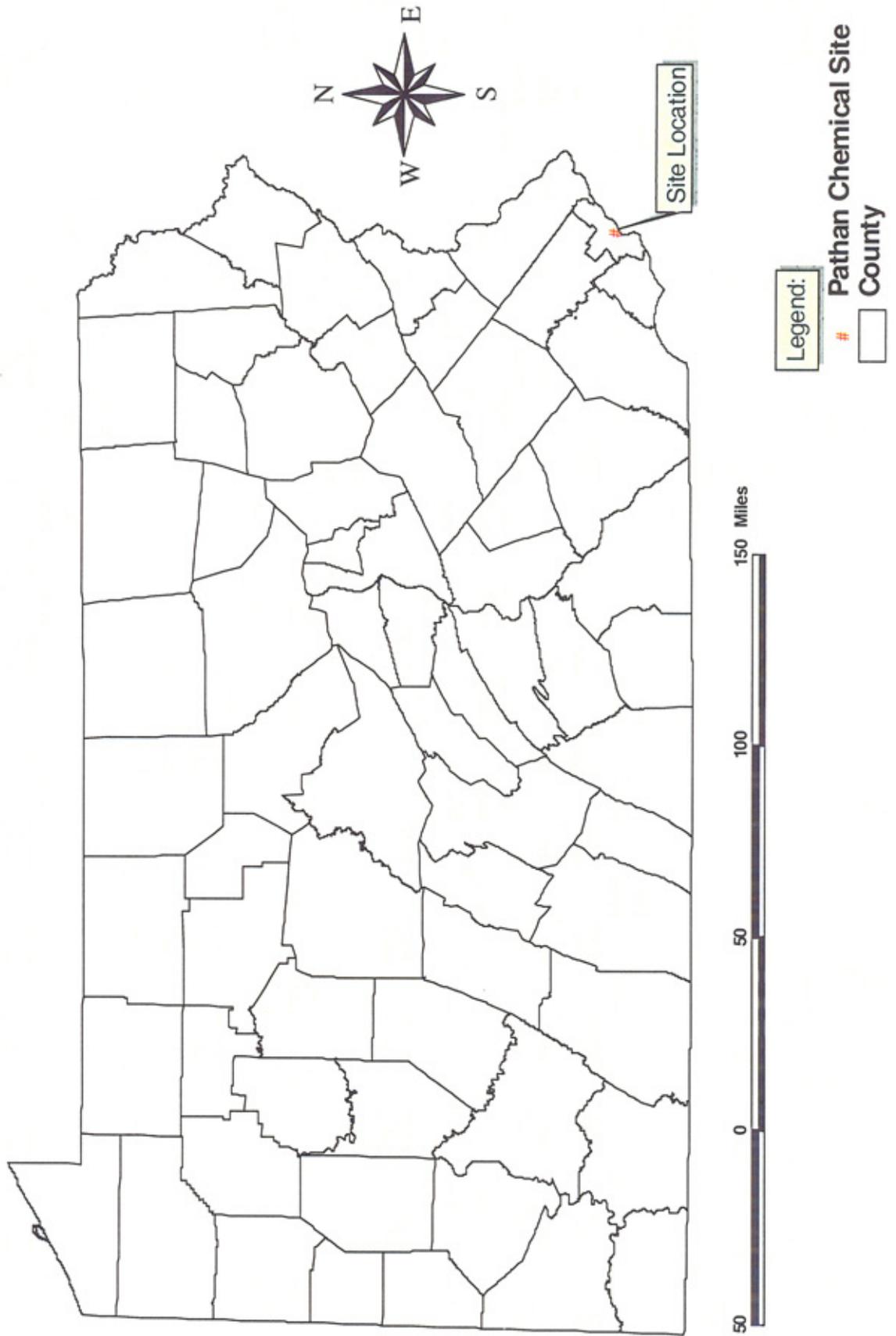
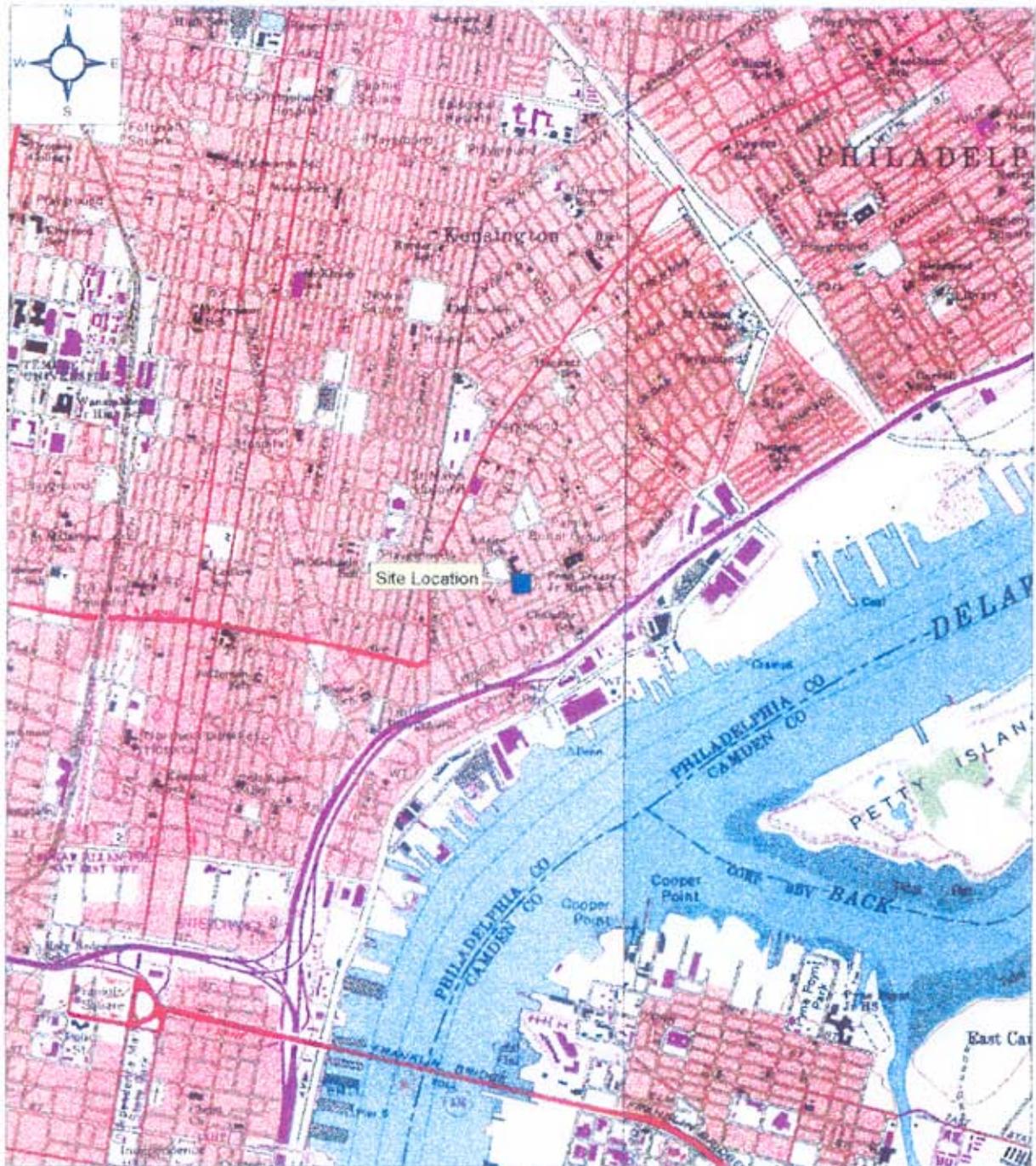


Figure 2
 Pathan Chemical Location Map



Source: Modified from USGS 7.5-Minute Series Topographic Quadrangle,
 Camden, New Jersey - Pennsylvania, 1967, Revised 1994
 Philadelphia, Pennsylvania - New Jersey, 1967, Revised 1994

0 0.25 0.5 Miles

Scale = 1:24000

Quadrangle Locations

Pennsylvania



Pathan Chemical Site
 Philadelphia, Pennsylvania

Site Location Map

TDD No. 03-01-04-004
 EPA Contract No. 68-S3-00-02

 Tetra Tech EM Inc.

Figure 3
Pathan Chemical Site and Local Area

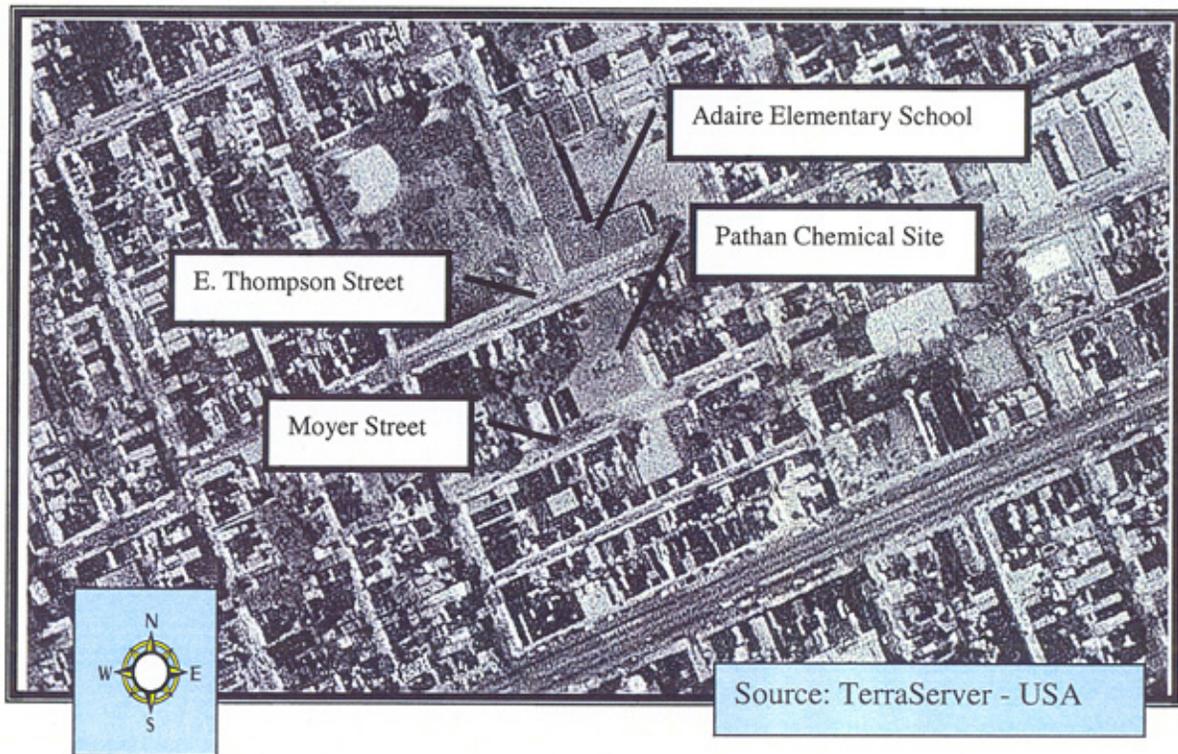
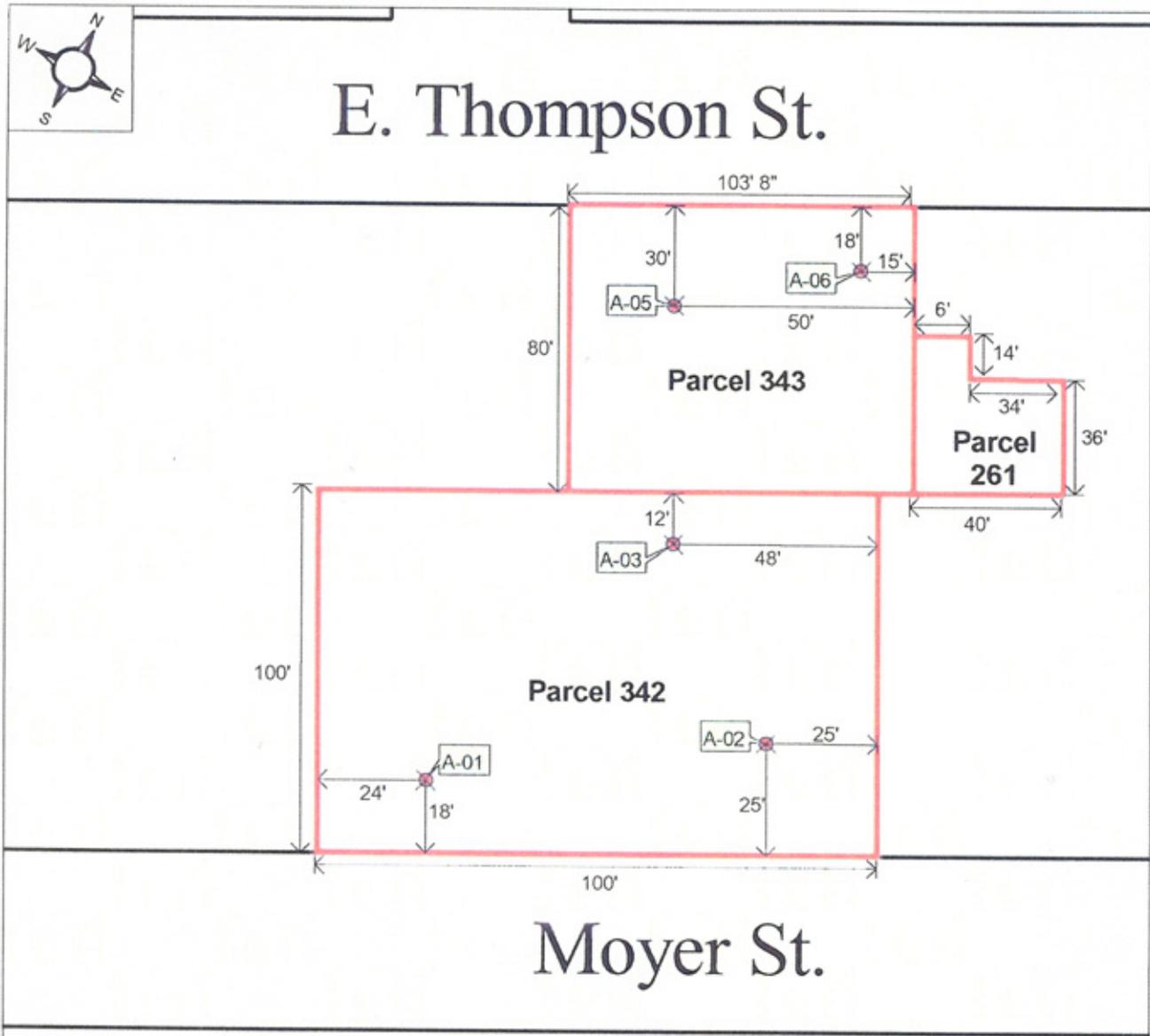
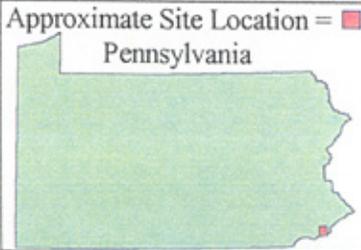


Figure 4
 Pathan Chemical Site Sampling Location



Source: Modified from Title Search Report for the Pathan Chemical Site, 427-447 East Moyer Street, Philadelphia, Booz Allen & Hamilton Inc, 1995.

Drawing is not to scale.
 Written dimensions are accurate.



Pathan Chemical Site
 Philadelphia, Pennsylvania

Parcel Identification and Air Sampling Location Map

TDD No. SE3-02-07-037
 EPA Contract No. 68-S3-00-02

 Tetra Tech EM Inc.