

**TARGETED BROWNFIELDS ASSESSMENT REPORT
ENVIRONMENTAL SITE ASSESSMENT PHASE II (ESA II)
FOR THE
LANCASTER AVENUE SITE
LANCASTER AVENUE, PHILADELPHIA, PENNSYLVANIA**

Prepared for

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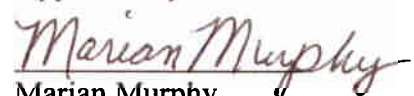
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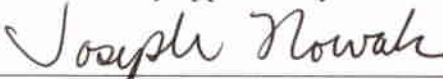
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1.0 INTRODUCTION

Under Eastern Area Superfund Technical Assessment and Response Team (START) Contract No. EP-S3-05-02, Technical Direction Document (TDD) No. E03-007-05-10-001, the U.S. Environmental Protection Agency (EPA) Region 3 tasked Tetra Tech EM Inc. (Tetra Tech) to conduct Targeted Brownfield Assessment (TBA) activities at the 6130-6150 Lancaster Avenue site in Philadelphia, Pennsylvania. A Phase II Environmental Site Assessment (ESA II) was performed at the site. The site is also known as the JASTECH Lancaster Avenue TBA site; however, this document refers to the site as the Lancaster Avenue site (site).

Tetra Tech prepared a sampling and analysis plan (SAP) for a Phase II Environmental Site Assessment (ESA II) and submitted it to EPA on December 5, 2005, for approval. Actual sampling on site was performed on December 21 and 22, 2005. On-site activities included soil and asbestos sampling from different parts of the site. This trip report summarizes the December 2005 sampling activities.

The trip report details site background information in Section 2.0, site activities in Section 3.0, sample handling in Section 4.0, deviation from the SAP in Section 5.0, sample analytical results in Section 6.0, data evaluation in Section 7.0, investigation derived waste (IDW) disposal in Section 8.0, conclusions in Section 9.0, and recommendations in Section 10.0. All references cited in this report are listed after Section 10.0.

2.0 BACKGROUND

This section provides information on site location and description, site history and previous investigations, drainage and surface water, regional geology and water supply, and project objective and data use.

2.1 SITE LOCATION AND DESCRIPTION

The property is located at 6130-6150 Lancaster Avenue, Philadelphia, Pennsylvania (see Figure 1, [Site Location Map](#)).



Source: Modified from USGS 7.5-Minute Series Topographic Quadrangles.
 Germantown, Pennsylvania, 1997
 Lansdowne, Pennsylvania, 1967, Revised 1994
 Norristown, Pennsylvania, 1966, Photorevised 1983
 Philadelphia, Pennsylvania-New Jersey, 1967, Revised 1994

0 0.25 0.5
 Miles

Quadrangle Location = ■

Pennsylvania



Lancaster Avenue Site
 Philadelphia, Pennsylvania

Figure 1
 Site Location Map

TDD No. E03-007-05-10-001
 EPA Contract No. EP-S3-05-02

Map created on February 22, 2006
 by D. Call, Tetra Tech START



According to the City of Philadelphia Tax Assessors Office, the property is identified as Lot 96-92, # 342132810 at Longitude 75.24° and Latitude 39.98°. The site encompasses approximately 1 acre. The property is approximately 195 feet by 236 feet. The property actually consists of parcels 6130, 6134, 6144, and 6150. However, the two parcels 6130 and 6134 (a wine and spirit shop) were excluded from the site investigations during the assessment.

The 1 acre property frontage runs along Lancaster Avenue in a commercial area of the Overbrook Section of the City of Philadelphia. The lot is rectangular and consists of a vacant building and fenced-in yard adjacent to Joe Giordano's Garden Groceries. The site is bordered by Lancaster Avenue to the northeast, the D. J. Laundromat and Hunan Palace to the southeast, residential areas to the south and southwest, and a bus and trolley station to the northwest, which is operated by the Southeastern Pennsylvania Transportation Authority (SEPTA). Across from the property, on Lancaster Avenue to the northeast, are a Citgo Gas Station, a United Auto Repair Center, a U-Haul rental agency, and a Maaco Auto Body Shop. A wooded area exists within the southwest fence line of the property. The area within the perimeter of the fenced-in yard is partially paved. Site features are provided in Figure 2, Site Layout Map.

2.2 SITE HISTORY AND PREVIOUS INVESTIGATION

The vacant building and adjoining fenced-in yard were previously occupied by the Philadelphia Building Supply Company, Inc. The facility operated as a building supply business providing items such as gravel, sand, stone, concrete, brick, and building supplies. Prior to operations by the Philadelphia Building Supply Company, Inc., the facility was a supermarket.

Safety Management Consultant, LLC (Safety Management) of Cherry Hill, New Jersey, performed a Phase I Environmental Site Assessment (ESA I) at the site for JASTECH Development Services, Inc., of Philadelphia, Pennsylvania, in May 2002. In the ESA I report, Safety Management provided a site description, information from a site reconnaissance and interviews, results of an environmental database search, and findings and conclusions. Safety Management did not collect any samples from the site in May 2002. Their ESA I assessment

concluded that, “This environmental update has revealed no evidence of recognized environmental conditions in connection with this property.” Safety Management also mentioned in the ESA I report that “the original Phase I Environmental Site Assessment was performed for this property on October of 1999 for Mrs. Marlene Giordano of Giordano Groceries of Philadelphia, Pennsylvania.” They did not provide any details about the October 1999 ESA I report (Safety Management 2002). The copy of ESA I report dated October 1999 was not received by EPA or Tetra Tech.

2.3 DRAINAGE AND SURFACE WATER

The site is approximately 1.5 miles from Concourse Lake, located within Fairmount Park, and approximately 3 miles from the Schuylkill River. According to the ESA I report, the property generally slopes to the east towards the Schuylkill River (Safety Management 2002).

2.4 REGIONAL GEOLOGY AND WATER SUPPLY

The lithology around the site is Gniess/Schist. Site-specific data from the Great Bear Spring Co., located within 2 miles of the subject property, identified the depth of the groundwater as approximately 25 feet below ground surface (bgs), and a regional groundwater flow to the east (Safety Management 2002).

According to the United States Department of Agriculture; Soil Conservation Services, the soils at the property are classified as Ur-Urban Land. An Urban Land consists of areas more than 80 percent covered by buildings and pavements.

According to the ESA I report, approximately seven wells are located within 0.25 to 0.5 mile of the property, and the depth of water table is approximately 25 feet bgs. Current use of the seven wells is not known. Water for the areas surrounding the site is supplied by the City of Philadelphia water distribution system (Safety Management 2002).

2.5 PROJECT OBJECTIVE AND DATA USE

The site is the proposed location for the Overbrook Environmental Education Center under the Community Design Collaborative Project (Rolf Sauer & Partners Ltd. 2005). According to the design proposal prepared by Mr. Travis Dockwiler of Rolf Sauer & Partners Ltd., the future construction at the site is to include:

- A rainwater cistern and children's hand pump
- One tiny amphitheater
- One infiltration stage to be used as a lecture platform
- A walk-in-woods trail
- One roof cistern and a bog runnel
- One secret garden entrance
- One bio-lab
- One parking patio
- One porous paving area
- Flow-through planter boxes
- One bio-retention system
- Rain barrels to hold rain water
- One gated entrance.

Details of the items mentioned above appear in Attachment A.

Four areas for performance of infiltration tests were specified on a drawing received from Shandor J. Szalay of F. X. Browne, Inc., on site on December 17, 2005. Mr. Szalay's drawing was taken from Roy E. Gerould's "Plan of Survey & Exist. Conditions" dated October 17, 2004 (Gerould 2004). On the drawing, three infiltration test locations were specified at the center of the entrance parking lot, and the fourth test location was at the southeast corner of the site along the hillside in the wooded area. The maximum depth of the infiltration pits was specified as 36 inches. The purpose of the infiltration test was to construct a infiltration platform stage at the center of the parking lot in the future.

The objective of the this (Phase II ESA) sampling was to identify the presence or suspected presence of any hazardous material or substances in the basement, warehouse, parking area, and wooded area on the south side of the site. Based on the information provided by F. X. Browne, Inc., all soil samples from the infiltration test pits were to be sampled from 0- to 36-inch depth, and all future construction activities associated with the Community Design Collaborative Project were to be limited to a maximum depth of 36 inches bgs.

3.0 SITE ACTIVITIES

This section describes the number of site visits performed and the sampling event.

3.1 FIRST SITE VISIT

The first site visit occurred on October 17, 2005, and the following personnel were present during the visit.

- Drew Lausch, EPA Region 3 Brownfield Coordinator
- Philip Rotstein, EPA Region 3 Brownfield Work Assessment Manager
- Mrinal Biswas, Tetra Tech
- Jerome Shabazz, Executive Director, JASTECH Development Services, Inc.
- Tavis Dockwiller, Rolf Sauer & Partners Ltd.
- Suzanna Fabry, Rolf Sauer & Partners Ltd.
- Shandor J. Szalay, Project Manager, F. X. Browne, Inc.
- John Edelstein, Brownfield Coordinator, City of Philadelphia.

The purposes of the site visit were to become familiar with the site and the surrounding areas, to identify a sampling strategy, and to select the sampling locations. All personnel present on site walked around the site. Tetra Tech documented the site features and performed photo documentation. The team identified a parking lot, a warehouse, a basement, and wooded area at the south side of the site. Three personnel (Phil Rotstein, Mrinal Biswas, and Jerome Shabazz) entered the basement area of the site. In the basement, the team discovered three transformers, two aboveground storage tanks (ASTs), one boiler, and a water heater. All three transformers were locked during the first site visit.

After the first site visit, a SAP was drafted by Tetra Tech. Based on the SAP, Tetra Tech planned to collect soil samples (including a sample from the storm grate), transformer oil samples, and samples from asbestos-containing material (ACM).

A photographic documentation log for the first site visit is in Appendix A.

3.2 SECOND SITE VISIT

A second site visit occurred on November 30, 2005. Participants included EPA Brownfield Project Manager Joseph A. Nowak, Tetra Tech's Mrinal Biswas and Jim Kilpatrick, and Marvin Kingcadf of JASTECH Development Services, Inc. The purpose of the second site visit was to open the transformers in the basement, to check the approach to the roof (to collect samples from roofing material), and to identify the location of the storm grate.

3.3 SAMPLING

All samples (except the background soil sample) were collected on December 21, 2006, at the Lancaster Avenue site. Personnel present during the sampling were:

- Charlie Kleeman, Branch Chief, EPA Brownfield Section
- Joe Nowak, EPA Region 3 Brownfield Work Assignment Manager
- Marian Murphy, Tetra Tech Senior Chemist
- Jim Kilpatrick, Tetra Tech Equipment Manager
- Mrinal Biswas, Tetra Tech Senior Engineer
- Jerome Shabazz, JASTECH Corporation
- Aquil Ali, JASTECH Corporation
- Michelle DiMegilo, F. X. Browne, Inc.
- Jim Sassans, Ferric Construction
- Russell A. Robb, Ferric Construction.

The background soil sample was collected across the street from the site (in front of the U-Haul property) on December 22, 2006, by Marian Murphy.

Tetra Tech submitted a SAP to EPA on December 5, 2005, outlining the proposed sampling activities at the site. According to the SAP, Tetra Tech planned to collect [not including quality assurance/quality control (QA/QC) samples]: eight surface soil samples from the basement area; four subsurface soil samples from infiltration test pits (the parking lot area); four surface soil samples and one storm grate sample from the wooded area; and two floor tile, two wall plaster, and one roofing material samples from the warehouse area. On December 21 and 22, 2005, Tetra Tech collected 16 surface soil samples (including two duplicate and one background

samples), four subsurface soil samples, three floor tile samples (including one duplicate sample), two wall plaster samples, and one sample from the roofing material. All sampling locations are shown on Figure 3, Sample Location Map. Table 1 provides a sampling summary, including sample number, sample matrix, sample location and depth, sample analyses performed, and sample time. A photographic documentation log for the sampling event is in Appendix B.

All surface soil samples were collected by using a plastic spoon and mixing thoroughly in aluminum pans. However, mixing of soil was not applicable when the samples were collected for VOC analysis.

The map F. X. Browne, Inc., provided Tetra Tech on December 17, 2005, showed four locations and depths of the infiltration tests to be performed on site. However, the construction of a test pit at location 4, proved impossible (to sample by means of a test pit) because of the presence of rock formation beneath the ground surface. No sample was collected from test pit location 4. A new location 5 was chosen in front of the warehouse, and an infiltration test was performed there. EPA agreed to provide a backhoe for digging the four test holes.

Tetra Tech subcontractor Ferric Construction was on site with two personnel, one backhoe, one decontamination metal pan, and a supporting truck with a water tank (including pressure jet arrangement). Ferric Construction dug the infiltration test pits using the back hoe. Each test pit was approximately 3 to 4 feet in diameter and 36 inches in depth. One person from F. X. Browne, Inc., performed four infiltration tests from four test pits (Test Pits 1, 2, 3, and 5) on December 21, 2006. Tetra Tech collected four subsurface soil samples from the four test pit locations (locations 1, 2, 3, and 5). Test pits 1, 2, and 5 contained mostly native soil mixed with rubbles, wood and small concrete pieces. Test pit 3 contained native soil mixed with stone and rock pieces. During collection of subsurface samples, Tetra Tech used disposable gloves and thoroughly mixed the soil on aluminum pans before collecting them in glass jars.

Broken pieces of floor tiles and roofing material were available inside the warehouse. For asbestos sampling, pieces of materials from floor tile, wall plaster, and roofing material were

collected by Tetra Tech and placed in double Zip-lock bags. A photodocumentation log detailing the first site visit on October 17, 2005, is in Appendix A, and another photodocumentation log detailing the sampling activity on December 21, 2005, is in Appendix B.

**TABLE 1
SAMPLING SUMMARY**

Sample No.	Sample Matrix	Location/Depth of Sampling	Analysis Performed	Sample Time
Basement Area				
LA/SS-01	Soil	From drain pit located at the center of the basement	TAL Metals/ BTEX /PAH	11:45
LA/SS-02	Soil	West of heating oil tank at the basement	TAL Metals/ BTEX/PAH	11:48
LA/SS-03	Soil	East of heating oil tank at the basement	TAL Metals/ BTEX /PAH	11:50
LA/SS-04	Soil	West of heater at the basement	TAL Metals/BTEX/PAH	12:00
LA/SS-05	Soil	North of Transformer 1 at the basement	TAL Metals/PCB/Chlorobenzenes	11:10
LA/SS-06	Soil	North of Transformer 2 at the basement	TAL Metals/PCB/Chlorobenzenes	11:15
LA/SS-07	Soil	North of Transformer 3 at the basement	TAL Metals/PCB/Chlorobenzenes	11:20
LA/SS-08	Soil	Close to the wall in the transformer area in the basement	TAL Metals/PCB/Chlorobenzenes	11:25
LA/SS-DUP1	Soil	Basement – Duplicate sample LA/SS-05	TAL Metals/PCB/Chlorobenzenes	11:12
Parking Lot Area				
LA/DS-09	Soil	Parking Lot – Test Pit Location 1, 30-36"	TAL Metals/Pesticides	10:40
LA/DS-10	Soil	Parking Lot Test Pit Location 2, 30-36"	TAL Metals/Pesticides	13:45
LA/DS-11	Soil	Parking Lot Test Pit Location 3, 30-36"	TAL Metals/Pesticides	11:25
LA/DS-12	Soil	Parking Lot – Test Pit Location 5, 30-36"	TAL Metals/Pesticides	13:20
LA/DECON	Water	Decontamination Water	TAL Metals/Pesticides	12:30
LA/RINSATE	Water	Rinsate Water (from equipment decontamination)	TAL Metals/Pesticides	10:25
Wooded Area				
LA/SS-13	Soil	Wooded Area – Location 1 West, 0-6"	TAL Metals/Pesticide/PAH	08:25
LA/SS-14	Soil	Wooded Area – Location 2 Southwest 0-6"	TAL Metals/Pesticide/PAH	08:27
LA/SS-15	Soil	Wooded Area – Location 3 South, 0-6"	TAL Metals/Pesticide/PAH	08:35
LA/SS-16	Soil	Wooded Area – Location 4 Southeast, 0-6"	TAL Metals/Pesticide/PAH	08:37
LA/SS-DUP2	Soil	Wooded Area – Duplicate sample LA/SS-16	TAL Metals/Pesticide/PAH	08:48
LA/SS-17	Soil	Storm Grate (Left of warehouse entrance, close to hand-pump)	TAL Metals/Pesticide/PAH	08:50
LA/SS-BG1	Soil	Background Surface Soil (across the street)	TAL Metals/Pesticide/PAH	14:12*
Warehouse Area				
LA/FT-01	Floor Tile	Warehouse Area – Floor Tile Location 1	Asbestos Analysis by PLM	09:10
LA/FT-02	Floor Tile	Warehouse Area – Floor Tile Location 2	Asbestos Analysis by PLM	09:15
LA/FT-DUP 1	Floor Tile	Warehouse Area – Duplicate LA/FT-02	Asbestos Analysis by PLM	09:17
LA/WP-03	Wall Plaster	Warehouse Area – Wall Plaster Location 1	Asbestos Analysis by PLM	09:20
LA/WP-04	Wall Plaster	Warehouse Area – Wall Plaster Location 2	Asbestos Analysis by PLM	09:25
LA/ROOF-05	Roof	Warehouse Area – Roofing Material	Asbestos Analysis by PLM	09:30

Notes:

All samples (except the background sample) were collected on December 21, 2006.

The background sample was collected on December 22, 2006.

BTEX	Benzene, toluene, ethylbenzene, and xylenes	PAH	Polynuclear aromatic hydrocarbon	SS	Surface Soil
DS	Depth Soil	PCB	Polychlorinated biphenyl	TAL Metals	Target Analyte List Metals
FT	Floor Tile	PLM	Polarized light microscopy	WP	Wall Plaster
LA	Lancaster Avenue	ROOF	Sample from roofing material		

4.0 SAMPLE HANDLING

All soil samples collected from the site were handled in accordance with Tetra Tech's SOP No. 005, "Soil Sampling" (Tetra Tech 1999b). Samples collected during site activities were handled in accordance with Tetra Tech's "Quality Assurance Project Plan (QAPP) for START" (Tetra Tech 2005). All sampling activities were recorded a field logbook in accordance with Tetra Tech SOP No. 024, "Recording of Notes in Field Logbook" (Tetra Tech 2000b). Sample collection and shipping procedures were conducted in accordance with Tetra Tech SOP No. 019, "Packaging and Shipping Samples" (Tetra Tech 2000a). All sample equipment was decontaminated in accordance with Tetra Tech SOP No. 002, "General Equipment Decontamination." (Tetra Tech 1999a). Sample number, sample identifiers, collection dates and times, container types and amounts, and preservative types were recorded on Form II Lite chain-of-custody record forms. Copies of the chain-of-custody records for all sample shipments and analytical data package are in Attachments B and C respectively.

5.0 DEVIATION FROM THE SAMPLING PLAN

Based on the SAP dated December 5, 2005, Tetra Tech planned to:

- eight surface soil samples from the basement area
- four depth soil samples from the parking lot area
- four surface soil samples and one storm grating sample from the wooded area
- two floor tile, two wall plaster, and one roofing material samples from the warehouse area for ACM analysis.

During the sampling activity on December 21, 2005, Tetra Tech did not deviate from the sampling strategy or sample numbers. However, one depth sample to be collected from the

southeast corner (wooded area) of the property was collected from the parking lot area because the back hoe could not reach an approximate depth of 36 inches bgs at the southeast corner due to rocky surface beneath the ground.

6.0 SAMPLE RESULTS

The following sections discuss the analytical results for the December 2005, sampling events. Tetra Tech compared the site-specific results to EPA Region III's residential risk-based concentrations (RBCs) as part of the risk-based screening process in order to identify contaminants of potential health concern that may require further evaluation. The RBCs used for such screening purposes correspond to a 1.0×10^{-6} (one in one million) excess lifetime cancer risk for carcinogens and hazard quotient (HQ) of 0.1 for non-carcinogens. The HQ is adjusted downward for non-carcinogens to take into account possible additive health effects. The site-specific results that exceed levels corresponding to a 1.0×10^{-4} (one in ten thousand) excess lifetime cancer risk for carcinogens and hazard quotient (HQ) of 10.0 for non-carcinogens could pose a more immediate risk to human health.

The number and type of samples collected and the analysis performed for each sample are provided in Table 1, Sampling Summary, in Section 3.3.

6.1 SOIL SAMPLING RESULTS

This section describes the analytical results for soil samples collected on December 21, 2005 (on site) and December 22, 2006 (off site). The site is the proposed location for the Overbrook Environmental Education Center under the Community Design Collaborative Project (project). Because the project will involve children, as well as adults, soil samples were compared with residential risk-based concentrations (RBC) (EPA 2005) and Medium-Specific Concentrations (MSC) of residential soils from a depth to 0 to 15 feet under Act 2 of Pennsylvania Department of Environmental Protection (PADEP) (PADEP 2003).

6.1.1 Metal Analytical Results

During the December 2005 sampling event, Tetra Tech collected 17 soil samples (excluding duplicate and background soil samples) from the site. Tetra Tech also collected two duplicate soil samples and one background soil sample in December 2005. All soil samples were analyzed for TAL metals.

The concentration of antimony in 9 soil samples ranged from 3.6 to 15.4 milligrams per kilogram (mg/kg). The RBC for antimony is 3.1 mg/kg and its MSC is 88 mg/kg. However, the concentration of antimony in the background soil sample was 3.7 mg/kg, above its RBC but below its MSC.

The concentration of arsenic in all 17 soil samples ranged from 3 to 16.3 milligrams per kilogram (mg/kg). The RBC for arsenic is 0.43 mg/kg and its MSC is 12 mg/kg. However, the concentration of arsenic in the background soil sample was 6.6 mg/kg, above its RBC but below its MSC.

The concentration of cadmium in one soil sample was 11.9 mg/kg. The RBC for cadmium is 7.8 mg/kg and its MSC is 47 mg/kg. However, the concentration of cadmium in the background soil sample was 1.9 mg/kg, which is below both RBC and MSC.

The concentration of chromium in 10 of the 17 soil samples ranged from 32.6 to 71.8 mg/kg. The chromium results were compared with hexavalent chromium RBCs and MSCs. The RBC for hexavalent chromium is 23.5 mg/kg and its MSC is 94 mg/kg. However, the concentration of chromium in the background soil sample was 36.4 mg/kg, above its RBC but below its MSC.

The concentration of copper in one sample was 512 mg/kg. The RBC for copper is 310 mg/kg and its MSC is 8,200 mg/kg. However, the concentration of chromium in the background soil sample was 77.1 which is below RBC and MSC.

The concentration of iron in all 17 soil samples ranged from 13,400 to 124,000 mg/kg. The RBC for iron is 2,346.4 mg/kg and the MSC is 66,000 mg/kg. However, the concentration of iron in the background soil sample was 18,800 mg/kg, above its RBC but below its MSC.

The concentrations of lead in four out of 17 samples ranged from 512 to 712 mg/kg and exceeded lead's EPA screening level 400 mg/kg and MSC of 500 mg/kg. [There is no RBC for lead, however, EPA recommended a screening level of 400 mg/kg in Office of Solid Waste and Emergency Response (OSWER) Directive 9355.4-12, dated July 14, 1994.

The concentration of thallium in three of the 17 soil samples ranged from 2.0 to 6.9 mg/kg. The RBC for thallium is 0.55 mg/kg, and its MSC is 15 mg/kg. The concentration of thallium in the background soil sample was non-detect (ND).

The concentration of vanadium in all 17 soil samples ranged from 20.4 to 127.0 mg/kg. The RBC for vanadium 7.8 mg/kg, and its MSC is 1,500 mg/kg. The concentration of vanadium in the background soil sample was 26.3 mg/kg, which is above RBC but below MSC.

Table C1 in Appendix C identifies RBCs and MSCs of various metals, and indicates the samples with analytes that exceeded their RBCs and/or MSCs.

6.1.2 Volatile Organic Compound Analytical Results

Tetra Tech analyzed eight soil samples and one duplicate sample (collected from basement area) for volatile organic compound (VOC). None of the soil samples exceeded RBCs and/or MSCs for VOCs.

6.1.3 Semivolatile Organic Compound Analytical Results

Tetra Tech analyzed nine soil samples, one background sample, and one duplicate sample for semivolatile organic compound (SVOC).

The concentration of benzo(a)pyrene in six of the soil samples ranged from 0.33 to 1.4 mg/kg. The RBC for benzo(a)pyrene is 0.087 mg/kg, and its MSC is 2.5 mg/kg. However, the concentration of benzo(a)pyrene in the background soil sample was 3.3 mg/kg, above both its RBC and MSC.

Benzo(b)fluoranthene was detected in two soil samples at a concentration of 1.3 mg/kg in both samples. The RBC for benzo(b)fluoranthene is 0.87 mg/kg, and its MSC is 25 mg/kg. However, the concentration of benzo(b)fluoranthene in the background soil sample was 4.0 mg/kg, above its RBC but below its MSC.

The concentration of dibenzo(a,h)anthracene in five of the soil samples ranged from 0.12 to 0.27 mg/kg. The RBC for dibenzo(a,h)anthracene is 0.087 mg/kg, and its MSC is 2.5 mg/kg. However, the concentration of dibenzo(a,h)anthracene in background soil sample was 0.59 mg/kg, above its RBC but below its MSC.

The concentration of indeno(1,2,3-cd)pyrene in one sample was 1.2 mg/kg, above its RBC of 0.875 mg/kg but below its MSC of 25 mg/kg. The concentration of indeno(1,2,3-cd)pyrene in background soil sample was also high (1.6 mg/kg) and exceeded RBC value.

The concentration of n-nitrosodimethylamine in one soil sample was 8.0 mg/kg. The RBC for n-nitrosodimethylamine is 0.087 mg/kg, and its MSC is 2.5 mg/kg. The concentration of n-nitrosodimethylamine in background soil sample was not detected.

Soil sampling results for SVOCs are in Table C-2 in Appendix C.

6.1.4 Pesticide Analytical Results

Tetra Tech analyzed nine soil samples, one duplicate, and one background sample for pesticides. None of the soil samples exceeded any RBC or MSC values for pesticides.

6.1.5 PCB Analytical Results

Tetra Tech analyzed four soil samples and one duplicate sample for PCBs. All samples were collected from the transformer area in the basement. PCBs were not detected in any of the samples collected from the basement.

6.2 WATER SAMPLING RESULTS

Between each excavation event, the subcontractor decontaminated the backhoe bucket thoroughly to avoid cross-contamination between the pits. No power or water supply was at the site. The subcontractor arranged necessary power and water supply for decontamination. The decontamination was performed in a steel pan approximately 5 feet in diameter and 2 feet high that the subcontractor brought on site. The decontamination water was collected by the subcontractor in a 55-gallon drum provided by the subcontractor. Tetra Tech collected one sample from the drum containing the decontamination water and also collected one rinsate sample from the site (as a quality assurance [QA]/quality control [QC] sample). The samples were analyzed for TAL metals and pesticides. To determine whether the decontamination water could be discarded by dumping on the ground, decontamination water was compared with surface water RBCs and with MSC values for organic and inorganic regulated substances for a non-use residential aquifer. The decontamination water was also compared with applicable Resource Conservation and Recovery Act (RCRA) Toxicity Characteristic Leaching Procedure (TCLP) threshold values. RBCs for surface water were not available in the RBC table. Tap water RBCs were multiplied by 10 to derive the surface water RBCs.

6.2.1 Metal Analytical Results

Decontamination water was analyzed for TAL metals.

The concentration of antimony in the decontamination water sample was 15.2 micrograms per liter ($\mu\text{g/L}$) and exceeded its RBC ($14.60 \mu\text{g/L}$) but did not exceed its MSC ($6,000 \mu\text{g/L}$).

The concentration of arsenic in the decontamination water sample was 22.3 µg/L and exceeded its RBC (0.45 µg/L) but did not exceed its MSC (50,000 µg/L).

The concentration of chromium in the decontamination water sample was 143 µg/L and exceeded its RBC (109.5 µg/L) (for hexavalent chromium) but did not exceed its MSC (100,000 µg/L).

The concentration of iron in the decontamination water sample was 101,000 µg/L and exceeded its RBC (10,950 µg/L). A MSC for iron has not been established.

The concentration of lead in the decontamination water sample was 636 µg/L and did not exceed its MSC (5,000 µg/L). A RBC for lead has not been established, however, for comparison purpose a 10 fold increase of tap water MCL ($15 \text{ µg/L} \times 10 = 150 \text{ µg/L}$) for lead was used.

The concentration of vanadium in the decontamination water sample was 189 µg/L and exceeded its RBC (36.5 µg/L) but did not exceed its MSC (720,000 µg/L).

Water sampling results for metals appear in Table C-3 in Appendix C.

6.2.2 Pesticide Analytical Results

The decontamination water sample was analyzed for pesticides.

The concentration of aldrin in the decontamination water was 0.043 µg/L and exceeded its RBC (0.039 µg/L) but did not exceed its MSC (0.87 µg/L).

Water sampling results for pesticides appear in Table C-3 in Appendix C.

6.3 ASBESTOS SAMPLING RESULTS

On December 21, 2005, Tetra Tech collected six samples (including one duplicate sample) of suspected ACM from the site. All samples were hand delivered to EMSL Analytical, Inc. (EMSL), located at Westmont, New Jersey, on December 23, 2005. The samples were analyzed with polarized light microscopy using EPA method for, "Analysis of Asbestos in Bulk Building Materials (EPA/600/R-93/116, July 1993)"(EPA 1993a).

All asbestos sample analytical results appear in Table C-4, Asbestos Sample Results, in Appendix C. Samples collected from the floor tiles and roofing material contained chrysotile asbestos, and presence of asbestos varied from 12 to 15 percent. Samples collected from the wall plaster did not contain any asbestos.

7.0 DATA EVALUATION

All organic and inorganic data were validated under the direction of the EPA Region 3 Office of Analytical Services and Quality Assurance (OASQA) in a manner consistent with the EPA Region 3 modifications to the national functional guidelines for organic and inorganic review. Organic data were validated at the M2 level by EPA OASQA or their contractor using EPA's "Region 3 Modifications to the National Functional Guidelines for Organic Data Review" and "Innovative Approaches to Data Validation" (EPA 1994, 1995). The inorganic data were validated at the IM 2 level as per the "Region 3 Modifications to the National Functional Guidelines for Inorganic Data Review" (EPA 1993b).

Six bulk asbestos samples were analyzed by EMSL for asbestos using polarized light microscopy per EPA "Analysis of Asbestos in Bulk Building Materials," method EPA/600/R-93/116, July 1993 (EPA 1993a). Three floor tile samples, two wall plaster samples, and one roofing tile sample were submitted to the laboratory for asbestos analysis. All three floor tile samples and both wall plaster samples had more than one layer of ACM. EMSL analyzed each layer separately and reported the results for each layer, providing a description of each layer. The data package submitted by EMSL was reviewed by Tetra Tech Senior Chemist Marian Murphy in

accordance with the EPA "Quality Assurance/Quality Control Guidance for Removal Activities," EPA/540/4-90/004, (EPA 1990). No major or minor problems were associated with the data package.

8.0 INVESTIGATION-DERIVED WASTE DISPOSAL

Investigation-derived Waste (IDW) generated from the sampling events in December 2005 consisted of solid (plastic scoops, aluminum pans, and surgical gloves) and liquid waste. Solid IDW was disposed of off site in plastic bags as dry industrial waste. The drum containing the decontamination water was carried by the subcontractor to its shop for safe custody (temporary) until further disposal. IDW analytical data was compared with RBC surface water, MSC Non-use Residential Aquifer and Resource Conservation Recovery Act (RCRA) Toxicity Characteristic Leaching Procedure (TCLP) threshold value. If PADEP decides that the liquid IDW does not pose any threat, the waste can be poured on ground.

9.0 CONCLUSIONS

This section concludes the soil, water, and asbestos data results.

9.1 SOIL INORGANIC RESULTS

Arsenic was present in all 17 samples and above its RBC (0.43 mg/kg), but only two samples (LA/SS-07 contained 15.7 mg/kg, and LA/SS-17 contained 16.30 mg/kg) contained arsenic above its MSC (12 mg/kg). LA/SS-07 was collected from basement and LL/SS-17 was collected from a storm grate located at the left of the warehouse entrance (close to the hand pump).

A few samples exceeded RBCs for cadmium, chromium, copper, thallium, and vanadium but none (including the background sample) exceeded MSCs for these analytes. However, LA/SS-03 collected from the basement heating oil tank area contains iron 124,000 mg/kg and exceeds MSC value of 66,000 mg/kg.

Lead was above its MSC (500 mg/kg) and EPA (400 mg/kg) values in four samples (LA/SS-03, LA/SS-08, LA/SS-15 and LA/SS-17), but the concentration of lead in the background sample was 455 mg/kg, which is above EPA value of 400 mg/kg but just below its MSC (500 mg/kg). Samples LA/SS-03 (from heating oil area) and LA/SS-08 (from transformer area) were collected from the basement area, LA/SS-15 was collected from wooded area, and LA/SS-17 was collected from the storm grate.

The concentration of lead in LA/SS-15 was 712 mg/kg. LA/SS-15 was collected from the wooded area located behind the stone bin. According to a schematic diagram titled "Overbrook Environmental Education Center," dated June 30, 2004, prepared by Tavis Dockwiller of Rolf Sauer & Partners Ltd., the area will be used for a walking trail. Either side of the walking trail should be covered with soil, black top paving, or green grass so that the soil dust will not become airborne. A copy of the schematic diagram for the Overbrook Environmental Education Center, Community Design Collaboration Project, is in Attachment A.

Surface soil samples were analyzed for target analyte list (TAL) Metals, benzene, toluene, ethylbenzene, and xylene (BTEX)/polynuclear aromatic hydrocarbon (PAH), and polychlorinated biphenyl (PCB). The fact that neither petroleum related substances, with the exception of the isolated occurrence of lead (only four out of 17 samples contained lead at concentrations above EPA screening level and MSC values) nor PCBs were detected during the ESA-2 studies.

None of the inorganic substances were detected at levels that could pose a more immediate threat to human health. However, absent a more detailed evaluation of risk, the data indicate that the presence of arsenic and lead in the storm grate, iron and lead in the heating oil tank area, and lead in the wooded area represent potential threats related to future use of this site for these types of substances.

9.2 SOIL ORGANIC RESULTS

The soil samples were analyzed for VOCs, pesticides, and PCBs. VOCs, pesticides, and PCBs do not pose any threat to the site because the concentrations of VOCs, pesticides, and PCBs in soil are below their RBCs and MSCs.

The soil samples were also analyzed for SVOCs. Concentrations of SVOCs benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene in on-site soil samples were above their RBCs, but all were below their MSCs and also below their background soil sample results.

The concentration of n-nitrosodimethylamine in sample LA/SS-04 (collected from east of the heating oil area in the basement) was 8 mg/kg, above its RBC (0.130 mg/kg) and MSC (0.023 mg/kg). The concentration of n-nitrosodimethylamine in background soil sample was non-detect.

None of the organic substances were detected at levels that could pose a more immediate threat to human health. However, absent a more detailed evaluation of risk, the data indicate that the presence of n-nitrosodimethylamine in the heating oil tank area represents a potential threat related to future use of this site.

9.3 ASBESTOS RESULTS

Samples collected from floor tiles and roofing materials contained approximately 12 to 15 percent chrysotile asbestos. Samples collected from wall plaster did not contain any asbestos.

Tetra Tech recommends that the floor tiles and roofing materials should be removed, with proper personal protective equipment and properly disposed before any work starts on site.

9.4 INVESTIGATION-DERIVED WASTE RESULTS

Investigation-derived Waste need not be compared with any standard regulatory guideline. However, to understand the nature and extent of concentrations of various organic and inorganic analytes in the decontamination water, IDW was compared with their RBCs/MCL, MSCs, and RCRA TCLP values.

The concentrations of antimony, arsenic, chromium, and vanadium in the liquid IDW were above their RBCs but below their MSCs. The concentration of lead in IDW was below MSC value but above the 10 fold MCL value. The concentration of iron was above its RBC value. No MSC has been established for iron. None of the IDW data exceeded any RCRA TCLP limits. Based on the available information, the IDW does not pose any threat to the environment; however, before it is poured on the ground, the PADEP representative should evaluate the analytical data.

10. RECOMMENDATIONS

Sample results were compared to PADEP's standards and EPA Region III's RBCs, as part of the risk-based screening process, to identify contaminants of potential concern, a more detailed risk evaluation was not performed as part of the ESA-II. Certain substances identified as contaminants of potential concern were also detected in the background sample at levels above RBCs. Absent a more extensive investigation of background conditions, it is impossible to determine the extent to which contaminants of concern such as metals could be attributed to widespread anthropogenic activities, as opposed to past site-related activities. For this reason, recommendations are offered in the interests of being protective, given the intended future use of this site. IDW data was also compared with RCRA TCLP values.

Tetra Tech recommends that before proceeding to construction activities associated with the Community Design Collaboration Project, the following actions be completed:

- Soil from the storm grate should be removed.
- Soil around the basement heating oil tank area should be removed.
- Soil around the basement transformer area should be removed.
- Soils around the walking trail in the wood should be covered with either soil, or concrete paving, or green grass

- Because the floor tiles and roofing materials contain ACM, proper personal protective equipment should be used during the removal of tiles and roofing materials from the site.
- IDW does not pose any treat to the environment; however, before waste is poured on the ground, a PADEP representative should evaluate the analytical data.

Any future response action in the form of soil removal should be conducted only after consultation with the City of Philadelphia and PADEP.

Removal of floor tiles and roofing materials containing ACM should be conducted in accordance with all applicable State and local guidelines and regulations.

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APPENDIX A
PHOTODOCUMENTATION LOG (FIRST SITE VISIT – OCTOBER 17, 2005)
(Nine Pages)



Photographic Documentation

Client: U.S. Environmental Protection Agency Region 3
Site Name: Lancaster Avenue Site
Location: Philadelphia, Pennsylvania
Date: October 17, 2005

Prepared by: Tetra Tech EM Inc.
Photographer: Mrinal Biswas
TDD Number: EO3-007-05-10-001

Photograph 1

Orientation: View from north

Description: Photograph taken from main entrance on Lancaster Avenue.

Personnel (from right to left): Phil Rotstein (1st) and Drew Lausch (5th) from EPA; Tavis Dockwiller (2nd) and Suzanna Fabry (3rd) from Rolf Sauer & Partners; Shandor Szalay (4th) from F. X. Browne; and Jerome Shabazz (6th) from JASTECH are discussing the site history before the site visit started.



Photograph 2

Orientation: Photograph taken from main entrance on Lancaster Avenue.

Description:
General view of the site from main entrance on Lancaster Avenue





Photographic Documentation

Client: U.S. Environmental Protection Agency Region 3
Site Name: Lancaster Avenue Site
Location: Philadelphia, Pennsylvania
Date: October 17, 2005

Prepared by: Tetra Tech EM Inc.
Photographer: Mrinal Biswas
TDD Number: EO3-007-05-10-001

Photograph 3

Orientation: View from south.

Description: Photograph taken from main entrance to the site on Lancaster Avenue.

U-Haul is located directly across Lancaster Avenue.



Photograph 4

Orientation: Photograph taken from main entrance on Lancaster Avenue towards east.

Description:
General view of Lancaster Avenue from the main entrance to the site on Lancaster Avenue. The area is mixed commercial and residential.





Photographic Documentation

Client: U.S. Environmental Protection Agency Region 3
Site Name: Lancaster Avenue Site
Location: Philadelphia, Pennsylvania
Date: October 17, 2005

Prepared by: Tetra Tech EM Inc.
Photographer: Mrinal Biswas
TDD Number: EO3-007-05-10-001

Photograph 5

Orientation: View from street level towards basement.

Description: Photograph taken standing at Lancaster Avenue behind the Joe Giordano's Garden Groceries.

Entrance to the basement was very dark, dirty, and with unstable steps.



Photograph 6

Orientation: Photograph taken in the basement looking from west to east.

Description:

Caged transformer area is visible. Three containers, each 4 feet high, 1.5 feet wide, and 2 feet deep and marked as 'distribution transformer,' were located inside the fenced area in the basement. Samples LA/SS-05,06,07, and 08 were collected from the transformer area.





Photographic Documentation

Client: U.S. Environmental Protection Agency Region 3
Site Name: Lancaster Avenue Site
Location: Philadelphia, Pennsylvania
Date: October 17, 2005

Prepared by: Tetra Tech EM Inc.
Photographer: Mrinal Biswas
TDD Number: EO3-007-05-10-001

Photograph 7

Orientation: View from main entrance to the site on Lancaster Avenue.

Description: One-and-a-half story red brick warehouse is visible on the right side of the photograph.



Photograph 8

Orientation: Photograph taken standing at the center of the warehouse towards the west.

Description: Deteriorating western wall might be plastered with asbestos-containing material. Wall plaster samples LA/WP-03 and 04 were collected from this area.





Photographic Documentation

Client: U.S. Environmental Protection Agency Region 3
Site Name: Lancaster Avenue Site
Location: Philadelphia, Pennsylvania
Date: October 17, 2005

Prepared by: Tetra Tech EM Inc.
Photographer: Mrinal Biswas
TDD Number: EO3-007-05-10-001

Photograph 9

Orientation: Photograph taken standing at the center of the warehouse towards west.

Description: Floor tiles might be made of asbestos-containing materials.



Photograph 10

Orientation: Drew Lausch and Phil Rotstein of EPA in front of the basement entrance on Lancaster Avenue.

Description:
The photograph was taken on Lancaster Avenue just behind the Joe Giordano's Garden Groceries (green wall on the right).





Photographic Documentation

Client: U.S. Environmental Protection Agency Region 3
Site Name: Lancaster Avenue Site
Location: Philadelphia, Pennsylvania
Date: October 17, 2005

Prepared by: Tetra Tech EM Inc.
Photographer: Philip Rotstein
TDD Number: EO3-007-05-10-001

Photograph 11

Orientation: Photograph taken in the basement.

Description: Electrical panel placed on the wall inside the cage marked as transformer area. One soil sample LA/SS-08 was collected from beneath the panel.



Photograph 12

Orientation: Basement right wall (looking from the entrance stair case).

Description: Debris of various kinds (wash basin, tire, wood and steel pieces, etc.) are located along the right wall of the basement.





Photographic Documentation

Client: U.S. Environmental Protection Agency Region 3
Site Name: Lancaster Avenue Site
Location: Philadelphia, Pennsylvania
Date: October 17, 2005

Prepared by: Tetra Tech EM Inc.
Photographer: Philip Rotstein
TDD Number: EO3-007-05-10-001

Photograph 13

Orientation: Photograph taken in the basement

Description: One old gas heater is located at the far end of the basement (opposite to the entrance) along the right wall. Sample LA/SS-04 was collected in front of the heater.



Photograph 14

Orientation: Basement left wall (looking from the entrance stair case)

Description:

Two aboveground storage tanks are located along the left wall of the basement. Samples LA/SS-02 and 03 were collected from this area.





Photographic Documentation

Client: U.S. Environmental Protection Agency Region 3
Site Name: Lancaster Avenue Site
Location: Philadelphia, Pennsylvania
Date: October 17, 2005

Prepared by: Tetra Tech EM Inc.
Photographer: Philip Rotstein
TDD Number: EO3-007-05-10-001

Photograph 15

Orientation: Photograph taken in the basement inside the fenced area.

Description: Three transformers were located in a fenced area at the basement (only two are visible in the photograph). The fenced area is shown in Photograph 6. Samples LA/05, 06, and 07 were collected from this area.

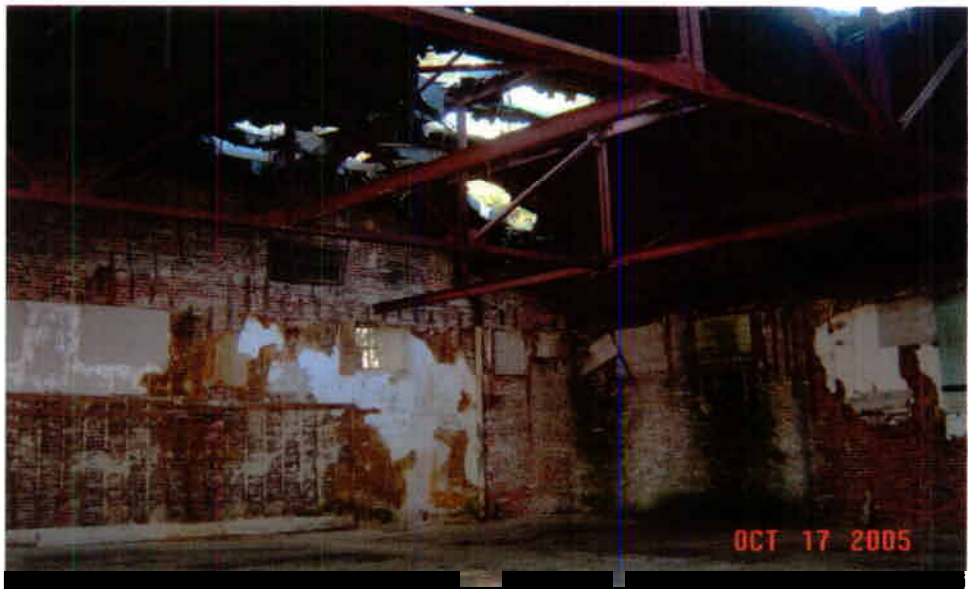


Photograph 16

Orientation: Northwest corner of the warehouse from the main entrance.

Description:

Roof trusses are in good shape but the roof and the walls have deteriorated considerably.





Photographic Documentation

Client: U.S. Environmental Protection Agency Region 3
Site Name: Lancaster Avenue Site
Location: Philadelphia, Pennsylvania
Date: October 17, 2005

Prepared by: Tetra Tech EM Inc.
Photographer: Drew Lausch
TDD Number: EO3-007-05-10-001

Photograph 17

Orientation: Photograph taken from the wooded area on the hill located on the south of the site.

Description: Entire parking lot is visible from top of the hill. The hill area is approximately 15 feet above the parking lot.



Photograph 18

Orientation: Photograph taken from south to north behind the warehouse.

Description:

Phil Rotstein from EPA (right) discussing the sampling strategy with Mrinal Biswas of Tetra Tech.



APPENDIX B
PHOTODOCUMENTATION LOG (SAMPLING EVENT – DECEMBER 21, 2005)
(Seven Pages)



Photographic Documentation

Client: U.S. Environmental Protection Agency Region 3
Site Name: Lancaster Avenue Site
Location: Philadelphia, Pennsylvania
Date: December 21, 2005

Prepared by: Tetra Tech EM Inc.
Photographer: Mrinal Biswas
TDD Number: EO3-007-05-10-001

Photograph 1

Orientation: View from north

Description: Photograph taken from main entrance on Lancaster Avenue.

Personnel (from right to left): Joe Nowak and Charlie Kleeman from EPA, and Jerome Shabazz from JASTECH are discussing the site history during the sampling event on December 21, 2005.



Photograph 2

Orientation: Photograph taken from main entrance on Lancaster Avenue.

Description:

General view of the site from the main entrance.





Photographic Documentation

Client: U.S. Environmental Protection Agency Region 3
Site Name: Lancaster Avenue Site
Location: Philadelphia, Pennsylvania
Date: December 21, 2005

Prepared by: Tetra Tech EM Inc.
Photographer: Mrinal Biswas
TDD Number: EO3-007-05-10-001

Photograph 3

Orientation: View from north to southwest

Description: Photograph taken from Lancaster Avenue.

General view of the site from outside the chain-link fence. Residential homes are located in the background. The warehouse is visible at the right of the photograph.



Photograph 4

Orientation: Photograph taken from outside the fence line looking towards the southwest.

Description:

General view of the site from the Lancaster Avenue.





Photographic Documentation

Client: U.S. Environmental Protection Agency Region 3
Site Name: Lancaster Avenue Site
Location: Philadelphia, Pennsylvania
Date: December 21, 2005

Prepared by: Tetra Tech EM Inc.
Photographer: Mrinal Biswas
TDD Number: EO3-007-05-10-001

Photograph 5

Orientation: Photograph taken inside the warehouse.

Description: Marian Murphy and Jim Kilpatrick from Tetra Tech are collected samples from the floor tiles.



Photograph 6

Orientation: Photograph taken inside the warehouse.

Description:

General view of the warehouse. Walls are in deteriorated condition.





Photographic Documentation

Client: U.S. Environmental Protection Agency Region 3
Site Name: Lancaster Avenue Site
Location: Philadelphia, Pennsylvania
Date: December 21, 2005

Prepared by: Tetra Tech EM Inc.
Photographer: Mrinal Biswas
TDD Number: EO3-007-05-10-001

Photograph 7

Orientation: Photograph taken inside the warehouse looking at the west wall.

Description: Samples were collected from the wall plaster for asbestos-containing material (ACM) analysis.



Photograph 8

Orientation: Photograph taken inside the warehouse.

Description:

Samples were collected from roofing material which was loosely lying on the floor for ACM analysis.





Photographic Documentation

Client: U.S. Environmental Protection Agency Region 3
Site Name: Lancaster Avenue Site
Location: Philadelphia, Pennsylvania
Date: December 21, 2005

Prepared by: Tetra Tech EM Inc.
Photographer: Mrinal Biswas
TDD Number: EO3-007-05-10-001

Photograph 9

Orientation: Photograph taken in the parking lot.

Description: One backhoe, attached with a jack hammer, was used to break the concrete from the parking lot.



Photograph 10

Orientation: Photograph taken in the parking lot

Description:

One backhoe was used to excavate the infiltration pit number 5, located in front of the warehouse. U-Haul is visible just other side of Lancaster Avenue.





Photographic Documentation

Client: U.S. Environmental Protection Agency Region 3
Site Name: Lancaster Avenue Site
Location: Philadelphia, Pennsylvania
Date: December 21, 2005

Prepared by: Tetra Tech EM Inc.
Photographer: Mrinal Biswas
TDD Number: EO3-007-05-10-001

Photograph 11

Orientation: Photograph taken in the parking lot.

Description: Backhoe bucket being decontaminated with water jet.



Photograph 12

Orientation: Photograph taken in the parking lot looking down an infiltration pit.

Description:

One backhoe excavated the pit and personnel from F.X. Browne is performing the infiltration test.





Photographic Documentation

Client: U.S. Environmental Protection Agency Region 3
Site Name: Lancaster Avenue Site
Location: Philadelphia, Pennsylvania
Date: December 21, 2005

Prepared by: Tetra Tech EM Inc.
Photographer: Mrinal Biswas
TDD Number: EO3-007-05-10-001

Photograph 13

Orientation: Photograph taken looking southwest from the parking lot.

Description: Marian Murphy and Jim Kilpatrick from Tetra Tech are collecting soil sample from the wooded area located along the southern boundary of the site.



Photograph 14

Orientation: Photograph taken in the parking lot looking southwest.

Description:

One hand pump and the storm grate (covered by leaves) are visible. Sample LA/SS-17 was collected from beneath the storm grate.



APPENDIX C
DATA SUMMARY TABLES

(Four Pages)

TABLE - C1
SOIL SAMPLING RESULTS ABOVE RBCs AND/OR MSC- METALS
Lancaster Avenue TBA Site, Lancaster Avenue, Philadelphia, PA
 (All units are in mg/Kg)

Chemical	RBC Residential	MSC Residential Soil 0-15 feet	SS-01	SS-02	SS-03	SS-04	SS-05	SS-06	SS-07	SS-08	SS-09	SS-10
Antimony	3.1	88			15.4			5.5	7.5	5.6		
Arsenic	0.4	12	4.3	6.8	8.2	4.9	6.8	9.7	15.7	9.1	7.1	3.9
Cadmium (food)	7.8	47				11.9						
Chromium VI*	23.5	94	59.2	55.2	49.6	71.8	70.4	61.4	70.9	59.6	46.3	
Copper	310.0	8200								512.0		
Iron	2346.4	66000	59900	48400	124000	64000	36400	56600	60700	37800	50800	30500
Lead	400.0	500			573					512		
Manganese (non food)	160.0	31000	709	539	880	559	746	1010	1120	660	672	515
Thallium	0.5	15			6.9	3.5						
Vanadium	7.8	1500	48.1	66.6	41.2	47.2	96.2	106.0	127.0	74.4	164.0	68.7
Chemical	RBC Residential	MSC Residential Soil 0-15 feet	SS-11	SS-12	SS-13	SS-14	SS-15	SS-16	SS-17	SS-DUP1	SS-DUP2	SS-BG1
Antimony	3.1	88			3.6				4.8	4		3.7
Arsenic	0.4	12	4.00	5.30	5.90	4.20	3.00	2.80	16.30	5.80	3.10	6.60
Cadmium (food)	7.8	47										
Chromium VI*	23.5	94							32.6	67.6		36.4
Copper	310.0	8200										
Iron	2346.4	66000	41100	29500	21600	27000	27700	26600	13400	31100	28200	18800
Lead	400.0	500					712		672			455
Manganese (non food)	160.0	31000	666.00	520.00	371.00	488.00	538	484	351	676	517	253
Thallium	0.5	15							2			
Vanadium	7.8	1,500	70.6	53.8	38.7	54.1	53.3	49.7	20.4	85.9	53.6	26.3
Notes:	Blank cell indicates either not detected or below RBC/MS values											
	Bold font indicates the result above RBC and MSC values.											
	Chromium result was compared with Chromium VI RBC											
	Lead screening level of 400 mg/kg was recommended by OSWAR Directive 9355.4-12, dated July 14, 1994											
	mg/Kg = milligrams per kilogram											
	RBCs were calculated from EPA Region III Risk-Based Concentration Table dated October 25, 2005											
	The RBCs used for screening purposes corresponds to a 1.0×10^{-5} (one in one million) excess lifetime cancer risk for											
	carcinogens and hazard quotient (HQ) of 0.1 for non-carcinogens.											

TABLE - C2
SOIL SAMPLING RESULTS EXCEEDING RBC AND/OR MSC VALUES - SVOCs
Lancaster Avenue TBA Site, Lancaster Avenue, Philadelphia, PA
(All units are in mg/Kg)

Chemical	Soil Residential RBC	Carcinogen	MSC Residential 0-15 feet	Sample No. SS-01	Sample No. SS-02	Sample No. SS-03	Sample No. SS-04	Sample No. SS-13	Sample No. SS-14	Sample No. SS-15	Sample No. SS-17	Sample No. SS-16	Sample No. SS-DUP2	Sample No. SS-BK1
Benzo(a)pyrene	0.087	C	2.50	0.33		1.40		0.55	0.83	0.41	1.10	0.50	0.45	3.30
Benzo(b)fluoranthene	0.875	C	25.00			1.30					1.30			4.00
Dibenzo(a,h)anthracene	0.087	C	2.50					0.14	0.23	0.12	0.27	0.16	0.14	0.59
Indeno(1,2,3-cd)pyrene	0.875	C	25.00			1.20								1.60
N-Nitrosodimethylamine	0.130	C	0.023				8.0							
Notes:														
Blank cell indicates either not detected or below RBC/MSc values														
BK =Background Sample														
C =Carcinogen														
DUP =Duplicate samples														
MSC =Pennsylvania Department of Environmental Protection Medium-Specific Concentrations, Residential, 0-15 Feet Depth														
mg/Kg=milligram per kilogram														
RBC =U. S. Environmental Protection Agency Region III Risk-Based Concentraions Table dated October 25, 2005														
SS =Surface Soil Samples														

TABLE - C3
WATER SAMPLING RESULTS COMPARED WITH RBC, MSC, AND TCLP - METALS AND PESTICIDES
Lancaster Avenue TBA Site, Lancaster Avenue, Philadelphia, PA
 (All units are in ug/L)

Chemicals	RBC Tap Water	Carcinogen Noncarcinogen	RBC* Surface Water	MSC None-use Residential Aquifer	TCLP (RCRA)	DECON
Metals						
Antimony	1.46	N	14.6	6000	NA	15.2
Arsenic	0.04	C	0.45	50000	5000	22.3
Chromium VI**	10.95	N	109.5	100000	5000	143
Iron	1095	N	10950	NA	NA	101000
Lead	15 (MCL)	NA	150	5000	5000	636
Vanadium	3.65	N	36.5	720000	NA	189
Pesticide						
Aldrin	0.0039	C	0.039	0.87	NA	0.043
Notes:						
*RBC Tap Water X 10 = RBC Surface Water						
** Used chromium IV RBC to compare with the chromium results						
C =Carcinogen						
DECON =Sample collected from decontamination water						
N =Non-carcinogen						
NA =Not applicable						
MSC =Pennsylvania Department of Environmental Protection Agency Medium Specific Concentration						
Non-use, Residential Aquifer						
RBC =U. S. Environmental Protection Agency Region III risk-based concentration Table dated October 25, 2005						
RCRA =Resource Conservation Recovery Act						
TCLP =Toxicity Characteristic Leaching Procedure						
µg/L =microgram per liter						

TABLE - C4
ASBESTOS SAMPLING RESULTS
Lancaster Avenue Site, Lancaster Avenue, Philadelphia, PA

Sample Identification No.	Location	Type	Condition	Asbestos Type	Percent Present
LA/FT-01	Warehouse Floor - Location 1	Floor Tile	Non-Fibrous	Chrysotile	12%
LA/FT-02	Warehouse Floor - Location 2	Floor Tile	Non-Fibrous	Chrysotile	15%
LA/FT-DUP 1	Warehouse Floor - Location 2	Floor Tile	Non-Fibrous	Chrysotile	15%
LA/WP-03	Warehouse Wall - Location 1	Wall Plaster	Non-Fibrous	None Detected	Not Applicable
LA/WP-04	Warehouse Wall - Location 2	Wall Plaster	Non-Fibrous	None Detected	Not Applicable
LA/ROOF-05	Warehouse Roof	Roofing Material	Non-Fibrous	Chrysotile	15%
Notes:					
Dup =Duplicate Sample					
FT =Floor Tiles					
LA =Lancaster Avenue Site					
WP =Wall Plaster					