



UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION III

STATEMENT OF BASIS

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
BLACKSBURG, VIRGINIA

EPA ID No. VAD074747908

Prepared by
Office of Remediation
Land and Chemicals Division

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List of Commonly Used Acronyms

AOC	Area of Concern
AR	Administrative Record
COC	Constituent of Concern
EPA	Environmental Protection Agency
FDRTC	Final Decision and Response to Comments
HSWA	Hazardous and Solid Waste Amendments
MCL	Maximum Contaminant Level
NFA	No Further Action
PAH	Polycyclic Aromatic Hydrocarbons
RCRA	Resource Conservation and Recovery Act
RSL	Regional Screening Level
SB	Statement of Basis
SVOC	Semi-Volatile Organic Compound
SWDA	Solid Waste Disposal Act
SWMU	Solid Waste Management Unit
UST	Underground Storage Tank
VADEQ	Virginia Department of Environmental Quality
VHWMR	Virginia Hazardous Waste Management Regulations
VOC	Volatile Organic Compound
VSWMR	Virginia Solid Waste Management Regulations

Section 1: Introduction

The U.S. Environmental Protection Agency (EPA) has prepared this Statement of Basis (SB) under the Corrective Action Program to solicit public comment on its proposed remedy for the Virginia Polytechnic Institute and State University (Virginia Tech or the University) facility for Area of Concern (AOC) 5 (Power Plant Underground Storage Tanks) located at 459 Tech Center Drive in Blacksburg, Virginia 24061 (Facility or Site). EPA's review of available information indicates that there are no unaddressed releases of hazardous waste or hazardous constituents from AOC 5. Based on that assessment, EPA's proposed decision is that no further investigation or cleanup is required. EPA has determined that its proposed decision is protective of human health and the environment and that no further corrective action or land use controls are necessary at this time. This SB highlights key information relied upon by EPA in making its proposed decision.

The Facility is subject to EPA's Corrective Action Program under the Solid Waste Disposal Act (SWDA), as amended by the Resource Conservation and Recovery Act (RCRA) of 1976, and the Hazardous and Solid Waste Amendments (HSWA) of 1984, 42 U.S.C. §§ 6901 *et seq.* (Corrective Action Program). The Corrective Action Program is designed to ensure that certain owners/operators of facilities subject to RCRA have investigated and cleaned up any releases of hazardous waste and hazardous constituents that have occurred at their property. The Commonwealth of Virginia (Commonwealth) was authorized for the Corrective Action Program under Section 3006 of RCRA on July 31, 2000 (65 Federal Register 46606).

The Commonwealth requested that EPA, in consultation with the Virginia Department of Environmental Quality (VADEQ), take the lead in overseeing Virginia Tech's completion of its corrective action obligations at the Facility. In October 2010, EPA and Virginia Tech entered into an Administrative Order on Consent, Docket No. RCRA-3-2010-0396CA, (Order) under Section 3008(h) of RCRA, 42 U.S.C. § 6928(h). Under the Order, Virginia Tech agreed to conduct a RCRA Facility Investigation (RFI) and Corrective Measures Study (CMS) at the Facility. Virginia Tech has completed the RFI and CMS for each of the Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) at the Facility. Based on that information on April 9, 2015, EPA issued a Final Remedy Decision for all SWMU's and AOC's except for AOC 5 (Power Plant Underground Storage Tanks). With this SB, EPA is now proposing no further action for AOC 5 (Power Plant Underground Storage Tanks).

This SB highlights key information relied upon by EPA in selecting its proposed remedy for AOC 5. For additional information, please refer to the Administrative Record (AR) for the Facility, which contains all documents, including data and quality assurance information, on which EPA's proposed remedy is based. The Index to the AR may be found in Section 5 of this SB. See Section 4, Public Participation, for information on

how you may review the documents contained in the AR and submit any comments you may have concerning this SB.

Section 2: Facility Background

2.1 Facility Description and History

The Facility is located at 459 Tech Center Drive in Blacksburg, Montgomery County, Virginia. The Site is bordered to the north and east by residential properties, to the west by residential and agricultural properties, and to the south by wooded areas and a research park. The Site covers approximately 4,420 acres. A Site Location Map and aerial photographs depicting the location and boundaries of the Site are attached to this SB as **Figures 1, 2 and 3**, respectively.

Virginia Tech was founded in 1872 as a land-grant college named Virginia Agricultural and Mechanical College. Virginia Tech is now a comprehensive, innovative research university. In addition to the 2,600-acre main campus, which has more than 100 campus buildings, the Facility also includes a 1,700-acre agriculture research farm near the main campus, and a 120-acre area covered by the Virginia Tech Montgomery Executive Airport (formerly the Virginia Tech Airport) and the Virginia Tech Corporate Research Center.

The Power Plant was constructed in the 1920's, and consists of two coal fired boilers and three natural gas boilers, with a backup fuel source (No. 2 fuel oil) stored in two cast-in place concrete USTs, and was designated in the September 29, 2010 Consent Order as AOC 5. The Power Plant USTs are located at the western corner of Turner Street and Barger Street in Blacksburg.

The Virginia Tech Power Plant USTs consist of two 137,000-gallon cast-in-place concrete vaults. The USTs were constructed in 1973, and each measures 50 feet long by 40 feet wide by 13 feet high. The tanks share a common center wall. The long axis of the tank system is parallel to Turner Street. The USTs stored No. 6 fuel oil (1974 through 2002), which was used to fire the boilers in the Power Plant, until the boilers were shifted to use No. 2 fuel oil. The USTs were retrofitted to store No. 2 fuel oil in July 2002. The facility stopped storing fuel oil in the tanks in 2017.

2.2 Environmental Setting

The Town of Blacksburg is located in the Valley and Ridge physiographic province, which is a belt of folded and faulted clastic and carbonate sedimentary rocks situated west of the Blue Ridge crystalline rocks and east of the Appalachian Plateaus. The Ridge is held up by Silurian-age sandstone and quartzite. Virginia Tech is located on structural block called the Blacksburg Synform created by late Paleozoic movement. The Site is

underlain by Cambrian age carbonate and shale bedrock of the Rome and Elbrook formations comprised primarily of phyllitic siliciclastics dolomite.

Depth to groundwater in the uppermost aquifer varies from less than 10 feet below ground surface (bgs) to more than 65 feet bgs. The uppermost aquifer resides in secondary porosity features including fractures, joints, and bedding planes in the underlying dolomite and shale bedrock. Groundwater levels and the local topography both indicate that groundwater in the uppermost aquifer discharges into Stroubles Creek and groundwater flow direction is generally to the north or west across the Site.

Section 3: Summary of Environmental Investigation

3.1 Environmental Investigations

EPA has identified a total of 21 SWMUs and 9 AOCs at the Site. Based on a review of all available information, EPA and the Virginia Department of Environmental Quality (VADEQ) Site visits on November 8, 2006 and September 23, 2010, and discussions with Facility representatives, EPA has determined that the only known soil and/or groundwater impacts relating to the SWMUs and AOCs addressed are at SWMUs 1 and 2 and AOC 5 (The Power Plant USTs). SWMUS 1 and 2 were addressed in the FDRTC issued on April 9, 2015. A summary of environmental investigations for AOC 5 is as follows.

Virginia Tech began to use the Power Plant USTs for storage of No. 2 fuel oil in August 2002. On December 6, 2002, the VDEQ received notification of a subsurface petroleum release at the Power Plant. The release was detected following the installation of early release detection wells (VW-1 and VW-2) for the two USTs. Upon receipt of the release notification, the VDEQ generated Pollution Complaint Number 2003-2053N (PC No. 2003-2053N) for the site.

VDEQ requested Virginia Tech conduct a site risk and remediation assessment for the release and submit a Site Check/Limited Site Characterization Report (SC/LSCR). Soil sample analytical results and observations made by Draper Aden Associates personnel, on behalf of Virginia Tech, during vent well installation in December 2002 and site characterization activities in May 2003 indicated that the petroleum impact at the Virginia Tech Power Plant UST site appeared to be limited to the soil depth interval of 12-18 feet below ground surface in the vicinity of vent well VW-1 and soil borings B-1, B-2, and B-4 (Figure 2). Soil sample concentrations ranged from non-detect to 5400 mg/kg of total petroleum hydrocarbons. EPA has no screening level for total petroleum hydrocarbons.

Based on these observations, the petroleum impact was estimated to cover an area of approximately 670 square feet, and the volume of petroleum-impacted soil was estimated to be approximately 108 cubic yards, overlain by approximately 298 cubic yards of non-impacted soil. In March 2004, approximately 143 tons of impacted soil adjacent to the eastern wall of the UST was removed and transported to an off-site treatment facility for disposal.

During the excavation of the petroleum impacted soils, free product was observed and was collected in drums for proper disposal. As the excavation progressed along the edge of the tank, the flow of free product increased and appeared more like #2 fuel oil. The excavation continued, and a small hole in the UST was found. The hole is located approximately one foot below the normal full tank level. The fuel oil level in the tank

was lowered to below the elevation of the hole and has remained there since. A 16-inch diameter monitoring and recovery sump was placed in the excavation and backfilled to facilitate further product recovery. The SC/LSCR presenting this work was submitted to VDEQ in June 2004.

Liquid levels were gauged in the sump and in vent well VW-1 on a monthly basis. VW-1 is a monitoring well for spill detection. No product resembling No. 2 fuel oil had been encountered in VT Drain No.1 or VW-1 during the monthly gauging efforts.

Attempts to collect samples from VT Drain No.1 were conducted quarterly. VT Drain No.1 is a storm water drain located downgradient of the UST and is the recipient collection point of groundwater at the base of the tank and a sentinel monitoring point. Analytical results from the samples collected during 2016-2017 indicated no detections of TPH-DRO or PAHs in VT Drain No. 1.

Tank removal started during May 2017 and was completed by July 2017. All UST concrete, liner, terra cotta piping, and approximately 1,000 cubic yards of surrounding soils (both contaminated and clean) down to approximately 13 feet to bedrock were disposed of in a Subtitle D municipal solid waste facility (HAM Sanitary Landfill, LLC) located in Peterstown, WV.

The USTs were essentially “keyed” into bedrock that surrounded a majority of the bottom three to seven feet of the UST structure. The USTs were surrounded by a footer drain that consisted of a 6-inch diameter footer drainpipe surrounded by gravels along the base of the outside perimeter of the USTs. The footer drainpipe and associated gravels (collectively referred to as the footer drain) were observed between the outside of the UST wall and the surrounding bedrock.

During the USTs’ demolition and removal, No. 6 fuel oil (free product) was encountered in the footer drainpipe and gravels located at the base of the USTs’ walls. Residual No. 6 fuel oil was encountered in gravels surrounding the footer drainpipe and staining was observed in surrounding silty clays, typically just above the bedrock. Due to low porosity and limited permeability, the bedrock appeared to have prevented any lateral or vertical migration or transport of product beyond the immediate vicinity of the USTs.

Representatives from the VDEQ visited the site when some of the initial free product was encountered in the footer drainpipe area. VDEQ requested the footer drainpipe and surrounding saturated gravels and soils be removed; and to collect approximately 40 to 50 confirmation samples from the sidewalls and base of the excavation. VDEQ requested the samples to be analyzed for Total Petroleum Hydrocarbons – Diesel Range Organics (TPH-DRO).

Concurrent to the removal of the USTs and to the extent practical, the free product, the footer drainpipe and surrounding gravels, and over 1,000 cubic yards of soils, some of it

impacted with petroleum, were removed from the UST excavation area and properly disposed. In general, visually observable petroleum impacts were removed to the extent feasible. The UST removal area was excavated down and out to bedrock; soil sidewalls were sloped back in an effort to remove petroleum-stained soils, where present, and to maintain slope stability. With VDEQ concurrence, a portion of the footer drain and small portions of the southeastern tank wall were left in-place to prevent damage to the Power Plant's natural gas infrastructure and other surrounding features that include adjacent sidewalks, roads, nearby utility lines, and the adjacent electrical substation, among others. Due to the "bathtub" effect of the bedrock, it appeared the petroleum impacts had not migrated beyond the immediate extents of the UST excavation and no pathways were observed suggesting petroleum migrated beyond the immediate vicinity of the USTs or offsite. The presence of bedrock along the base and lower sidewalls of the USTs suggested petroleum had been contained to within just a few horizontal feet of the UST walls and vertical migration beneath the USTs, if any, appears to have been significantly limited by the presence of continuous, competent bedrock.

During the removal of the USTs and impacted media, 47 confirmation soil samples were collected from the sidewalls and base of the UST excavation to assess the magnitude of petroleum impact to soils left in-place. All confirmation samples were analyzed for TPH-DRO with a carbon range of C10 through C34, which accounts for both No. 6 and No. 2 fuel oils. Approximately half of the confirmation soil samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX); and polynuclear aromatic hydrocarbons (PAHs). The results of confirmation soil sampling indicated the following:

- ◆ Analytical results of a majority of soil samples (36 of 47) analyzed for TPH-DRO were below 1,000 mg/kg; 28 of 47 samples were below 100 mg/kg (EPA does not have a RSL for TPH-DRO). VADEQ has a cleanup level of 44,700 mg/kg for Fuel Oil #6 and no samples exceeded this limit;
- ◆ Sporadic high concentrations of TPH-DRO were noted; however, these concentrations typically represented saturated gravels or localized hot-spots and were not representative of significant volumes of soils left in-place;
- ◆ Analytical results of a nearly all soil samples analyzed for contaminants of concern (36 of 38) were below the Regional Screening Levels (RSLs) for Residential Soils using 10-5 as a target cancer risk. The two samples exceeding RSLs were S-15 with 3.1 mg/kg of Benzo(a)pyrene (RSL of 1.1 mg/kg) and S-33 with 40 mg/kg of Naphthalene (RSL of 38 mg/kg). It should be noted S-16 next to S-15 was further in the soil excavation wall and had no exceedances for RSLs. No other PAHs were exceeded in S-15 and the TPH-DRO concentration was 54 mg/kg. For comparison, VDEQ accepts soils with concentrations of 50 mg/kg TPH-DRO as clean fill. Further excavation at S-33 was done so it is not representative of what oil contaminated soil was left in place. S-15 and S-33 were taken at the bottom of the excavation. Direct contact with soils in these areas is not possible because they are 10 feet underground or greater.

After the removal the hole was backfilled with clean soil. VADEQ monitored the

removal and did not require any further remediation for soil or groundwater.

Residual petroleum impacts are comprised of No. 6 fuel oil which is relatively immobile in soils, relatively insoluble, and do not contain chemicals of concern in sufficient quantity or composition to cause a potential vapor intrusion pathway risk. Furthermore, the observed concentrations of specific chemicals (SVOCs) detected in soils were all below applicable EPA Regional Screening Levels (RSLs) for residential sites, with minimal exceptions.

Groundwater was not encountered at the site and the area in the vicinity of the site is served by municipal drinking water provided by the New River Valley Water Authority. No drinking water wells are present within 1,000 feet of the former UST site.

Section 4: Public Participation

Before EPA makes a final decision on its proposed remedy for the Facility, the public may participate in the decision selection process by reviewing this SB and documents contained in the Administrative Record (AR) for the Facility. The Index to the AR may be found in Section 5 of this SB. The AR contains all information considered by EPA in reaching this proposed remedy. It is available for public review during normal business hours at:

U.S. EPA Region III
1650 Arch Street
Philadelphia, PA 19103
Contact: Leonard Hotham
Phone: (215) 814-2820
Fax: (215) 814-3113
Email: hotham.leonard@epa.gov

Interested parties are encouraged to review the AR and comment on EPA's proposed remedy. The public comment period will last thirty (30) calendar days from the date that notice is published in a local newspaper. You may submit comments by mail, fax, or e-mail to Mr. Leonard Hotham. EPA will hold a public meeting to discuss this proposed remedy upon request. Requests for a public meeting should be made to Mr. Leonard Hotham.

EPA will respond to all relevant comments received during the comment period. If EPA determines that new information warrants a modification to the proposed remedy, EPA will modify the proposed remedy or select other alternatives based on such new information and/or public comments. EPA will announce its final remedy and explain the rationale for any changes in a document entitled the Final Decision and Response to Comments (FDRTC). All persons who comment on this proposed remedy will receive a copy of the FDRTC. Others may obtain a copy by contacting Leonard Hotham at the address listed above.

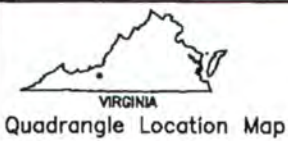
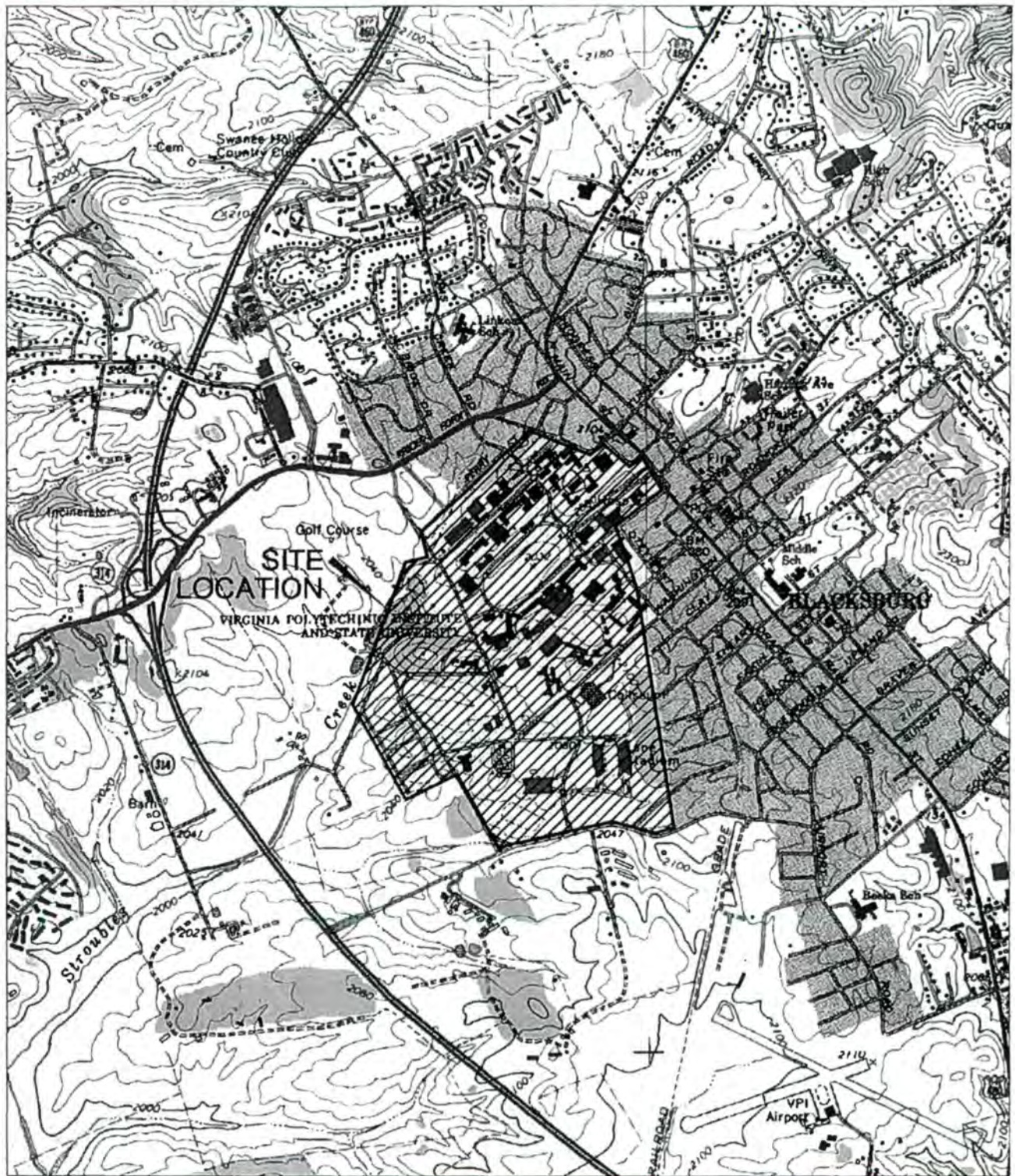
Date: 11-7-2017



Martha Shimkin, Acting Director
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Section 5: Index to Administrative Record

1. Draft RCRA Site Visit Report for Virginia Tech, prepared by Tetra Tech, Inc. for VADEQ and USEPA, April 2007.
2. Site Visit Memo to File, prepared by Jeanna R. Henry, USEPA Project Manager, September 28, 2010
3. 3008(h) Administrative Order on Consent, Docket No. RCRA-03-2010-0396CA, entered into by Virginia Tech and USEPA, September 29, 2010
4. Documentation of Environmental Indicator Determination, Current Human Exposures Under Control, completed by Jeanna Henry, EPA Project Manager, 3/21/2011
5. Documentation of Environmental Indicator Determination, Migration of Contaminated Groundwater Under Control, completed by Jeanna Henry, EPA Project Manager, 12/22/2011
6. RCRA Facility Investigation Workplan, Virginia Polytechnic Institute and State University Blacksburg, Virginia EPA ID No. VAD074747908, Health and Safety Services Virginia Tech and Draper Aden Associates, September 22, 2016
7. Site Characterization Report #3, UST Demolition, Removal, Closure, Site Characterization, and Remedial Actions, Draper Aden Associates, October 2017
8. Site Characterization and Abatement Measures Closure: The Virginia Tech Power Plant UST, VADEQ, November 2017



0 2000 4000 Feet

SOURCE: U.S.G.S. TOPOGRAPHIC MAP (7.5 Minute)
BLACKSBURG, VIRGINIA.



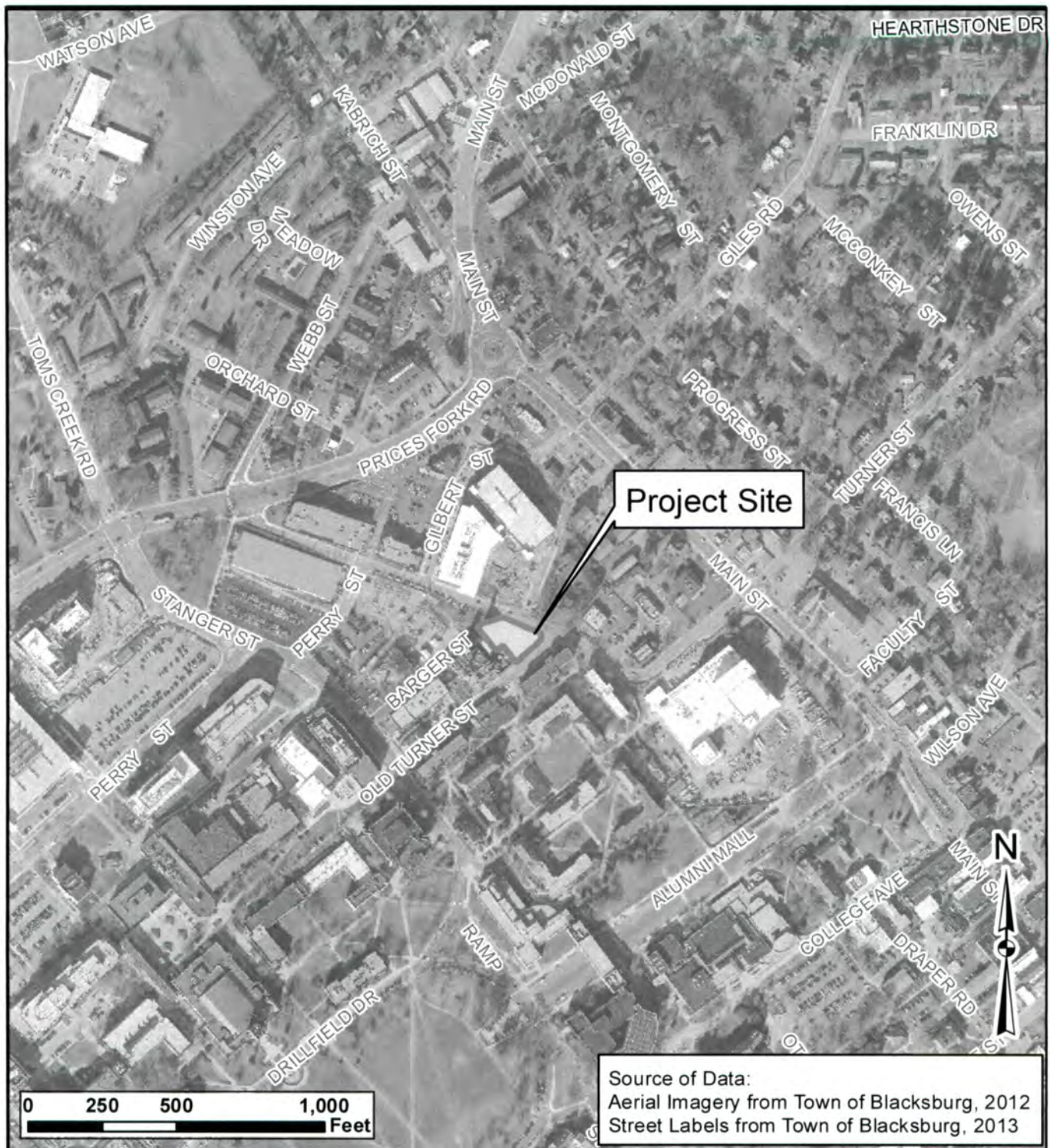
United States Environmental
Protection Agency

VIRGINIA TECH
Blacksburg, Virginia

FIGURE 1
SITE LOCATION MAP



TETRA TECH EC, INC.



Site Location Map

Virginia Tech Power Plant
Blacksburg, Virginia

SCALE: 1" = 500'

PLAN NO. B10131B-22E



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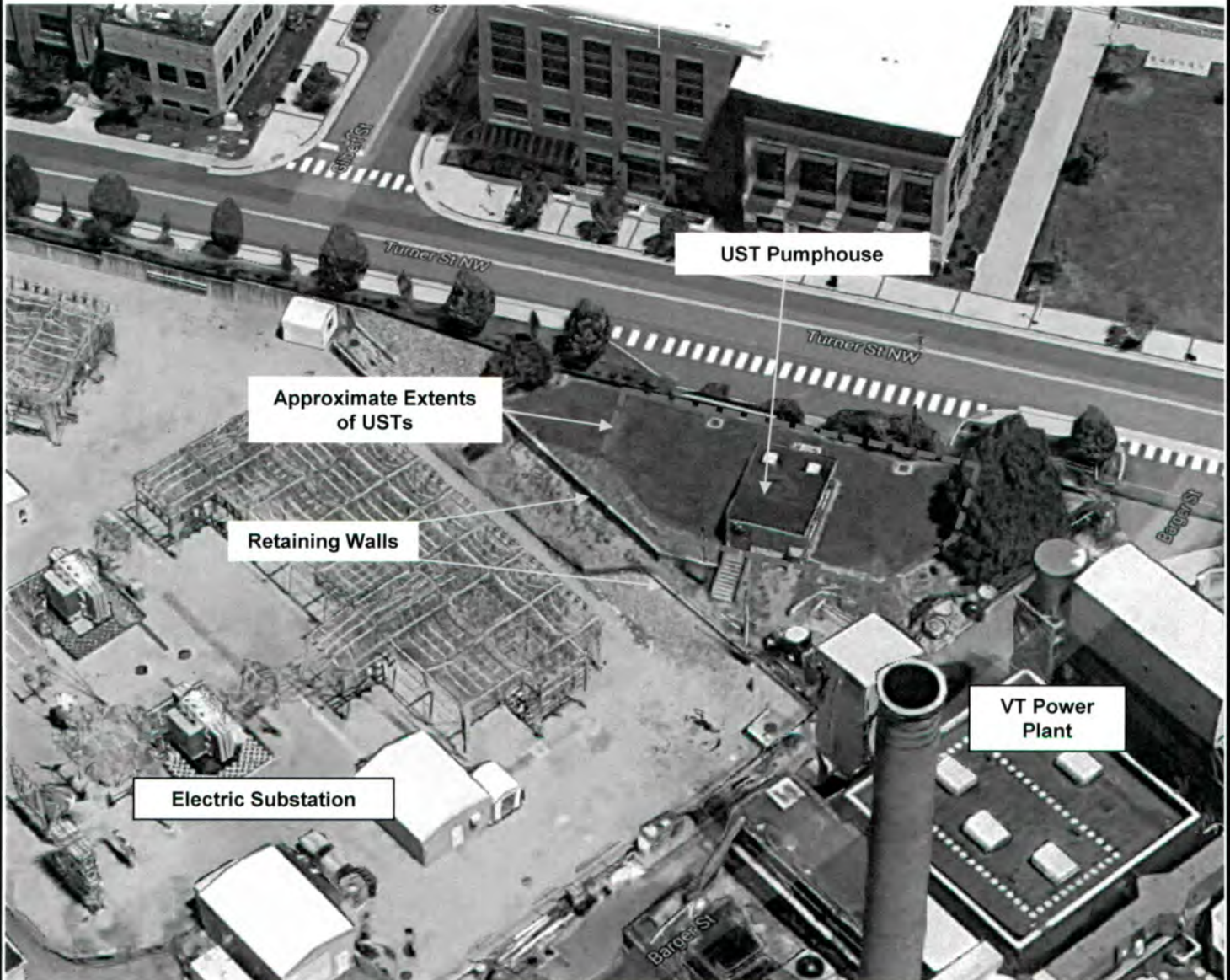
FIGURE

1

Photographs

UST Demolition and Site Characterization

Virginia Tech Power Plant Blacksburg, Virginia



PHOTOGRAPH 1. Aerial view facing north. USTs are subsurface trapezoidal concrete structure outlined in blue. Top of USTs is approximately on grade with Turner Street. Southwest portion of UST site is equipped with a concrete retaining wall. Site generally slopes southwest. The base of the USTs are approximately 15 feet below the grassy ground surface.



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