

**Chittenden County Brownfields Program  
Site Nomination / Assistance Request Form**

*For information on types of assistance available and  
CCRPC's protocol for deciding if, and to what degree to assist a request, see:  
<http://www.ccrpcvt.org/our-work/economic-development/brownfields/>*

Site Name: BHA Riverside Housing  
Site's Street Address/Town/Zip Code: 676 Riverside Avenue & 56 Bright St, Burlington, 05401  
Parcel Tax ID #: 040-2-098 040-2-101 Property Size (Acres): 0.16  
Zoning District: Residential - Medium Density  
Describe current use(s): Residential / Parking

Describe former use(s): Residential

Are there plans for acquisition and/or redevelopment? ☒ Yes ☐ No

If yes, attach a separate one to two-page document describing the anticipated benefits of the redevelopment such as housing units, commercial development, jobs, economic impact, recreation, etc. (see Site Evaluation Criteria at link above for the types of information to provide).

Have studies been conducted to identify or assess contamination? ☒ Yes ☐ No


If yes, please identify the title, author and date of the report, and if available, send us a PDF: KAS, Inc. - Phase I ESA and Subsurface Investigation & Soil Testing July 2018

Potential contaminants include: ☐ Petroleum ☒ Other contaminants

What type(s) of site assessment or cleanup planning assistance are you seeking? Circle all that apply

|                                       |  |
|---------------------------------------|--|
| Phase I Environmental Site Assessment | Phase II Environmental Site Assessment |
| Soil Monitoring during Construction   | Archeological Site Assessment / Recon  |
| Historic Preservation issues          | Cleanup / Corrective Action Planning   |
| Other                                 |  |

*Property Owner Information:*

Name: Burlington Housing Authority Signature:   
Mailing Address: 65 Main Street, Burlington, VT  
Phone: 802-658-1280 Email: cbarrett@burlingtonhousing.org

*Nomination Submitted By:*

Name or Office: Jeremy Roberts, KAS, Inc. Date Submitted: September 5, 2018  
Mailing Address: P.O. Box 787, Williston, VT 05495  
Phone: 802-383-0486 Email: JeremyR@kas-consulting.com

*Please Return Site Nomination Form (via PDF is preferred) to:  
Dan Albrecht, Senior Planner  
Chittenden County Regional Planning Commission 110 West Canal St., Suite 202 Winooski, VT 05404  
Phone: (802) 846-4490 Ext. \*29; Email: [dalbrecht@ccrpcvt.org](mailto:dalbrecht@ccrpcvt.org)*

Chittenden County Brownfields Program  
Site Nomination / Assistance Request

Proposed Riverside Housing Project  
676 Riverside Avenue / 56 Bright Street, Burlington, Vermont

BHA has since been exploring the feasibility of developing a small Permanent Supportive Housing building, modeled on its successful VHCB-funded housing development for homeless individuals. S2 Architecture has reviewed permitting and zoning requirements and has created a preliminary site plan, floor plan options and schematic drawings for a 12-14 unit building, a copy of which is attached. The proposed development necessitates the acquisition of an adjacent property at 56 Bright Street in order to meet Burlington's lot coverage and parking requirements.

Burlington Housing Authority has entered into a purchase and sale agreement with Mr. Alex Wolff to acquire an approximately 0.10 acre parcel located at 56 Bright Street. This parcel is adjacent to and south of 676 Riverside Avenue which was purchased by BHA in October 2014. BHA has conceptual plans in place to redevelop the two lots into a three story apartment complex which will provide much needed additional housing units in this area of Burlington.

Howard Development Services, which currently operates VHCB funded SRO'S for Developmentally Disabled Individuals has expressed an interest in four units for their clients. The other units will be for homeless or at-risk individuals, with primary referrals from the Chittenden Homeless Alliance's Coordinated Entry System. Rental Assistance will be tenant-based, provided either through BHA's Continuum of Care Rental Assistance Programs or through the Section 8 Housing Choice Voucher Program.

BHA's vision for the redevelopment of the property are provided in the attached pages.



589 Avenue D, Suite 10  
PO Box 787  
Williston, VT 05495

[www.kas-consulting.com](http://www.kas-consulting.com)

802 383.0486 p  
802 383.0490 f

September 5, 2018

Mr. Dan Albrecht, Senior Planner  
Chittenden County Regional Planning Commission  
110 West Canal Street, Suite 202  
Winooski, VT 05404

RE: KAS Proposal, Analysis of Brownfields Cleanup Alternatives (ABCA) /  
Corrective Action Plan (CAP) for 676 Riverside Avenue/56 Bright Street,  
Burlington, Vermont

Dear Mr. Albrecht:

KAS, Inc. (KAS) is pleased to present you this proposal for completion of an Analysis of Brownfields Cleanup Alternatives (ABCA)/Corrective Action Plan (CAP) for the 676 Riverside Avenue/56 Bright Street, Burlington, Vermont parcels ("property"). KAS has performed a Phase I Environmental Site Assessment and soil testing on this property and has an understanding of the existing environmental issues and the proposed redevelopment for the property.

Generally, the findings of previous environmental site assessment work at this property indicated that shallow soils contained polycyclic aromatic hydrocarbons (PAHs) at levels over what the Vermont Department of Environmental Conservation (VTDEC) and the Vermont Department of Health (DOH) deem safe for long-term human exposure. Additionally, tetrachloroethene (PCE) vapors above regulatory standards have been detected in soil gas samples collected in the vicinity of the property.

Scope of Work: KAS will work with Burlington Housing Authority (BHA) to prepare an ABCA/CAP based on the redevelopment conceptual materials provided to KAS. In addition to the conceptual plan layout we will need elevation drawings (sections and profiles) in order to accurately calculate soil quantities. KAS will prepare the ABCA/CAP according to current EPA and VTDEC requirements. KAS will develop the ABCA/CAP in digital draft for concurrent submittal to the project stakeholders, CCRPC, the VTDEC and the EPA, and will respond to comments and questions. KAS will attend and present at the required public information meeting.

Project Schedule: KAS is prepared to perform this work in a timely manner once the final redevelopment plans are in place. The ABCA/CAP will be prepared and distributed within one month of notice to proceed. Note that there is a one-month public comment period mandated by the VTDEC after the draft ABCA/CAP is distributed.



Mr. Dan Albrecht  
September 5, 2018  
Page 2

Project Organization and Staffing: The project will be managed by Jeremy Roberts, PG. Project engineering will be provided by Stephen Diglio, PE. The work will be overseen and reviewed by Erik Sandblom, PE.

Project Cost Estimate: KAS will complete the necessary consultations and ABCA/CAP for \$4,850 including the required public meeting. No site visits or additional testing are proposed to complete the ABCA/CAP.

Project MBR.WBE Fair Share Information: All of the work will be performed by KAS which is a certified WBE (Vermont Agency of Transportation) and a registered WBE (Vermont Department of Environmental Conservation).

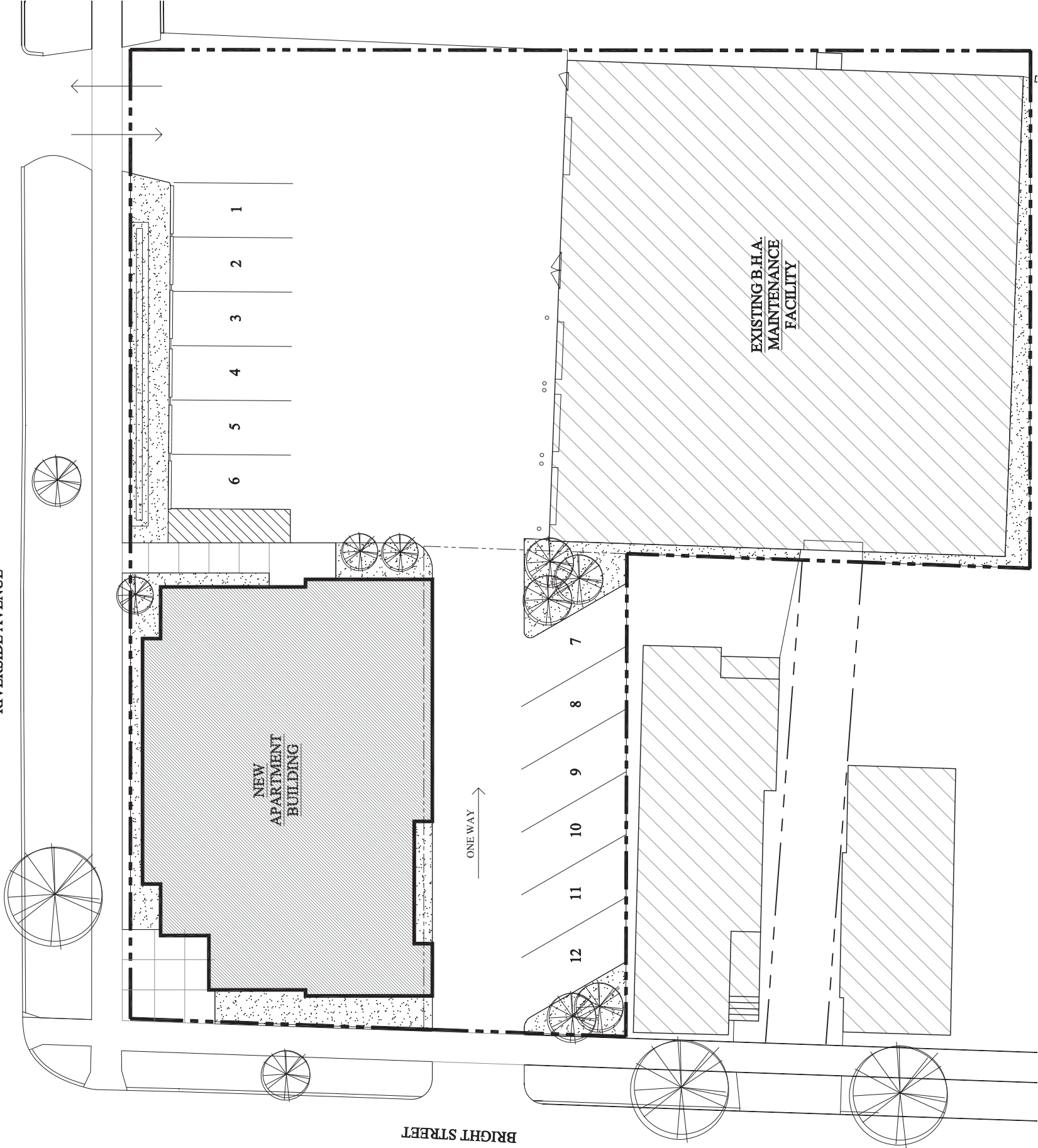
KAS would like to continue this work for BHA and appreciates the opportunity to present this proposal. Please call if you have questions.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Roberts", written over the printed name.

Jeremy Roberts, P.G.  
Environmental Program Manager

Enc/ cc: KAS #505180495



PROPOSED SITE INFORMATION

ZONING  
NMU: NEIGHBORHOOD MIXED USE

LOT SIZE

- 676,670 & 666 RIVERSIDE AVENUE = 16,278 SF (0.374 AC.)
- 55 BRIGHT STREET = 2,684 SF (0.062 AC.)
- COMBINED AREA = 18,962 SF (0.436 AC.)

LOT COVERAGE INFORMATION

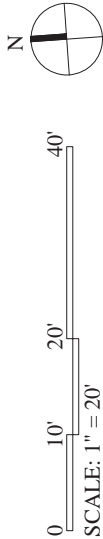
- PROPOSED APARTMENT BUILDING FOOTPRINT = 3,040 SF
- EXISTING B.H.A. FACILITY BUILDING = 6,018 SF
- PROPOSED WALKWAYS AND DRIVEWAY = 8,247 SF
- PROPOSED LOT COVERAGE = 92% (92% ALLOWABLE)

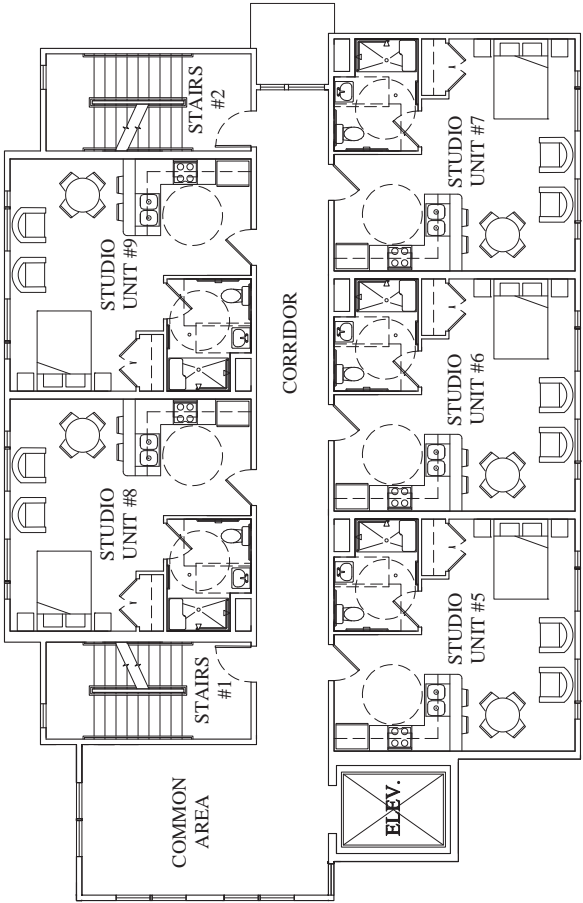
PROPOSED UNITS AND PARKING

- PROPOSED APARTMENT BUILDING 14 UNIT = 7 SPACES REQUIRED (ASSUMES 1 SPACE / DWELLING UNIT WITH WAIVER FOR 50%)
- EXISTING MAINTENANCE FACILITY = 5 SPACES REQUIRED (ASSUMES BUILDING IS CONSIDERED "AUTOMOTIVE REPAIR / SERVICE" BUILDING - 2 SPACES PLUS 1 SPACE PER BAY (3 BAYS)
- TOTAL PARKING SPACES = 12 (1 H/C SPACE)

SITE PLAN

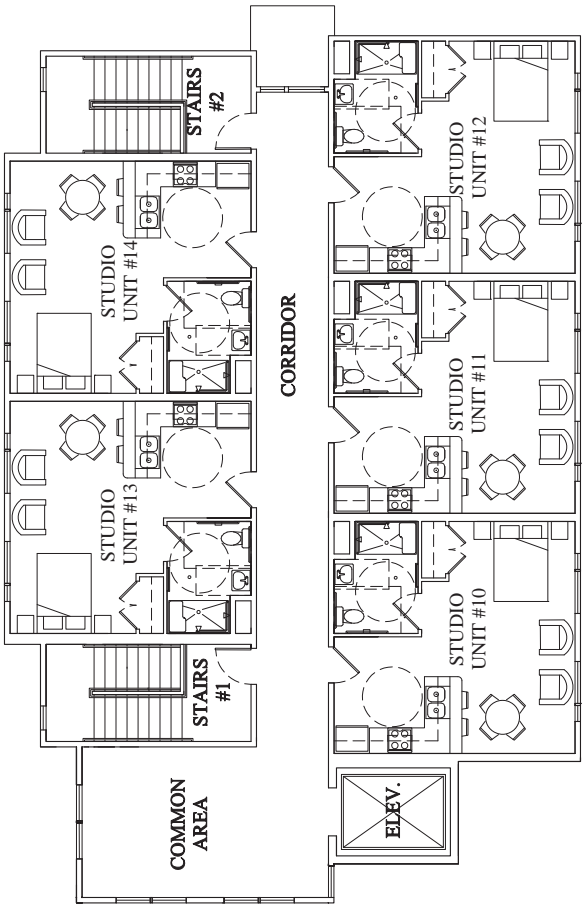
SCALE: 1" = 20'





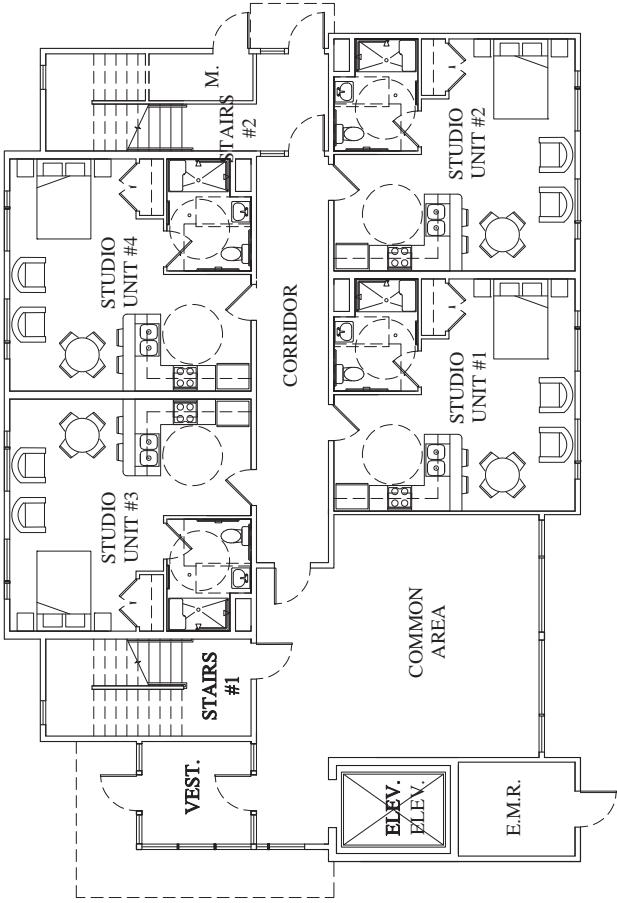
SECOND FLOOR PLAN - OPTION 'A'

SCALE: 1/16" = 1'-0"



THIRD FLOOR PLAN - OPTION 'A'

SCALE: 1/16" = 1'-0"



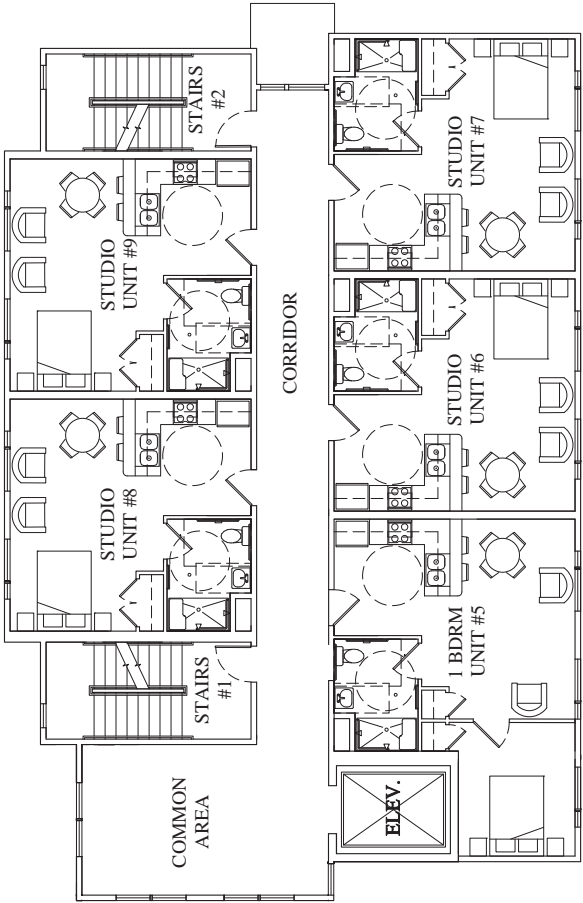
FIRST FLOOR PLAN - OPTION 'A'

SCALE: 1/16" = 1'-0"

NEW APARTMENT BUILDING - OPTION 'A'

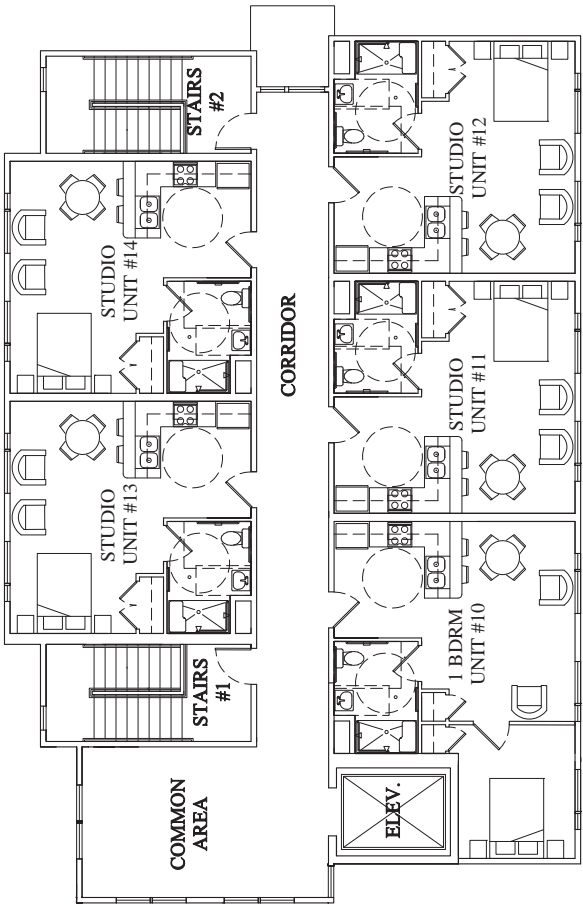
- 3 STORY BUILDING - 9,306 TOTAL SF
- 14 STUDIO UNITS - 4 UNITS 1ST FLOOR, 5 UNITS 2ND FLOOR, 5 UNITS 3RD FLOOR
- ELEVATOR AND ELEVATOR MACHINE ROOM
- COMMON AREA ADJACENT TO ENTRY AREA AND ELEVATOR LOBBY
- SMALL MECHANICAL ROOM
- MAIN ENTRY AT CORNER OF BRIGHT STREET AND RIVERSIDE AVE.
- BASEMENT OPTIONAL - STORAGE OF COMMON SPACE





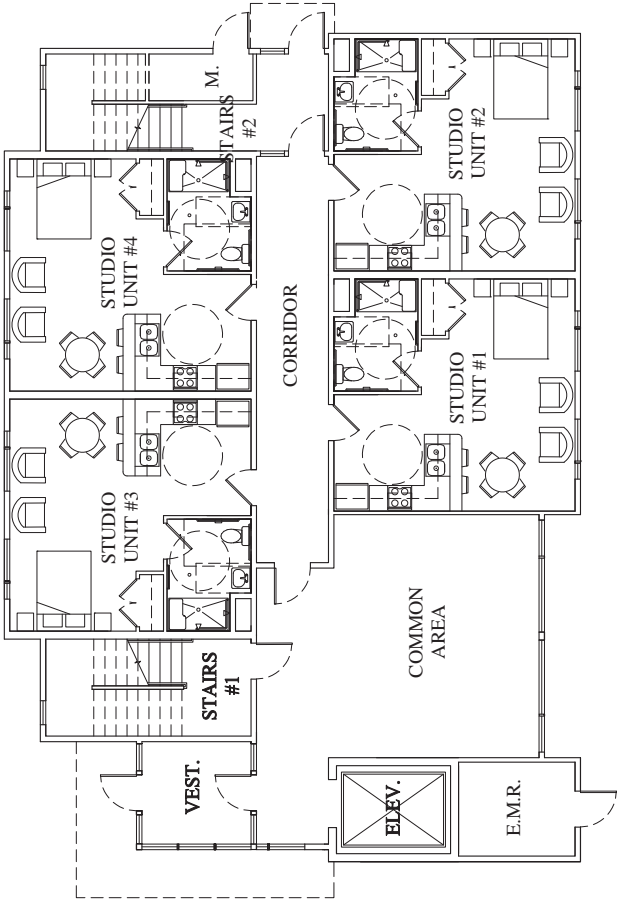
SECOND FLOOR PLAN - OPTION 'B'

SCALE: 1/16" = 1'-0"



THIRD FLOOR PLAN - OPTION 'B'

SCALE: 1/16" = 1'-0"



FIRST FLOOR PLAN - OPTION 'B'

SCALE: 1/16" = 1'-0"

NEW APARTMENT BUILDING - OPTION 'B'

- 3 STORY BUILDING - 9,480 TOTAL SF
- 12 STUDIO UNITS & 2 ONE BEDROOM UNITS = 4 STUDIOS 1ST FLOOR, 1 ONE BEDROOM AND 4 STUDIOS 2ND FLOOR, 1 ONE BEDROOM AND 4 STUDIOS 3RD FLOOR.
- ELEVATOR AND ELEVATOR MACHINE ROOM
- COMMON AREA ADJACENT TO ENTRY AREA AND ELEVATOR LOBBY
- SMALL MECHANICAL ROOM
- MAIN ENTRY AT CORNER OF BRIGHT STREET AND RIVERSIDE AVE.
- BASEMENT OPTIONAL - STORAGE OF COMMON SPACE







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July 30, 2018

Mr. Christopher Barrett, Director of Properties  
Burlington Housing Authority  
65 Main Street  
Burlington, VT 05401

RE: Phase I Environmental Site Assessment with Tier 1 Vapor Encroachment  
Screening –BHA Riverside Housing Project, 56 Bright St / 676 Riverside  
Avenue, Burlington, Vermont 05401

Dear Mr. Barrett:

KAS, Inc. (KAS) is pleased to present the attached report for the above-referenced property. The Phase I Environmental Site Assessment (ESA) was conducted in compliance with ASTM E 1527-13 and the Tier 1 VES was completed in accordance with ASTM E2600-10. Recognized environmental conditions (RECs) were identified in connection with the property as follows:

- The documented presence of urban fill contaminants in shallow soils beneath the property due to the location of the property within a long time urban environment.

KAS has reviewed available environmental data concerning the property and has determined that current or past uses of the property do not present material threat of a release of hazardous substances and/or petroleum products.

Land development in the vicinity of the property began in the 1800's. Historic fill has been known to be used during this time frame in Burlington/urban areas. Historic fill material can be composed of many different elements like wood, coal ash, construction demolition material, and residue from paint, fertilizers, gasoline, and other products. Common contaminants associated with historic fill such as polynuclear aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH) and metals, all of which could pose a risk to human health and the environment if not handled appropriately, were discovered in shallow soils beneath the property in June 2018. The identified presence of impacts to shallow soils beneath the property is considered to be a REC.

There are a number of nearby properties with environmental interest. Low to moderate levels of various chlorinated volatile organic compounds (CVOCs) have been documented to be present in soil vapors beneath several of these nearby properties and many other properties in Burlington. At many locations, the source of these CVOCs is not clear. It is possible the source is from the many historical dry cleaning and/or automobile repair garage facilities located throughout Burlington over the years. The potential for similar conditions to



Mr. Christopher Barrett  
July 30, 2018  
Page 2

exist beneath the subject property cannot be fully ruled out; however, as no release of CVOCs has been documented at or near the property, this condition is considered to be de minimis.

The Tier I VES concluded that a vapor intrusion risk to the property cannot be ruled out; however, a Tier 2 VES is not recommended as it is believed testing would not supply additional benefit for redevelopment at this time. Should redevelopment proceed the collection of soil vapor data should be considered prior to finalizing building designs so that any potential vapor intrusion risks, if present, are fully mitigated.

No Phase II ESA is recommended at this time. Should future redevelopment occur at the property in which excess soils will be generated, soils should be handled and managed under an approved Corrective Action Plan.

Thank you for this opportunity to be of service. Please call me should you have questions.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Roberts", written over the printed name.

Jeremy Roberts, P.G.  
Environmental Program Manager / Environmental Professional

Enc/ cc: KAS #505180495

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**BHA Riverside Housing  
56 Bright Street / 676 Riverside Avenue  
Burlington, Vermont 05401**

KAS #505180495

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**PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT  
WITH TIER 1 VAPOR ENCROACHMENT SCREENING**

July 30, 2018

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*Prepared for:*

*Burlington Housing Authority  
65 Main Street  
Burlington, VT 05401*



589 Avenue D, Suite 10  
PO Box 787  
Williston, VT 05495

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  - 2. Site Plan
  - 3. Tax Map
- B. Historical Research Documentation
  - 1. Sanborn Maps
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- E. Site Photographs
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## **1.0 EXECUTIVE SUMMARY**

KAS, Inc. of Williston, Vermont (KAS) conducted a Phase I Environmental Site Assessment (ESA) of land and premises at 56 Bright Street and 676 Riverside Avenue, in Burlington, Chittenden County, Vermont (property; see Appendix A, Site Location Map, Site Plan and Tax Map). The ESA was conducted pursuant to the American Society of Testing and Materials (ASTM) *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (ASTM E 1527-13). This Phase I ESA was performed and overseen by environmental professionals as defined by ASTM E 1527-13 and is believed to accurately represent the environmental condition of the property as of July 2018.

The property consists of two parcels which contain approximately 0.16 acre of land and are occupied by one structure; a 2-story residential building. The property is believed to have been first developed in the mid to late 1800's for use as residential housing. No other historical property uses were reported during this assessment.

KAS has reviewed available environmental data concerning the property and has determined that current or past uses of the property do not present material threat of a release of hazardous substances and/or petroleum products.

Land development in the vicinity of the property began in the 1800's. Historic fill has been known to be used during this time frame in Burlington/urban areas. Historic fill material can be composed of many different elements like wood, coal ash, construction demolition material, and residue from paint, fertilizers, gasoline, and other products. Common contaminants associated with historic fill such as polynuclear aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH) and metals, all of which could pose a risk to human health and the environment if not handled appropriately, were discovered in shallow soils beneath the property in June 2018 (see Appendix G). The identified presence of impacts to shallow soils beneath the property is considered to be a REC.

There are a number of nearby properties with environmental interest. Low to moderate levels of various chlorinated volatile organic compounds (CVOCs) have been documented to be present in soil vapors beneath several of these nearby properties and many other properties in Burlington. At many locations, the source of these CVOCs is not clear. It is possible the source is from the many historical dry cleaning facilities and/or former automobile service garages located throughout Burlington over the years. The potential for similar conditions to exist beneath the subject property cannot be fully ruled out; however, as no release of CVOCs has been documented at or near the property, this condition is considered to be de minimis.

There are a number of nearby sites of environmental interest which do not appear to pose tangible environmental risk to the property based on their identified contaminants, regulatory status, distance and/or direction to the property.

The adjacent property to the east (666 Riverside Avenue) currently operates as a maintenance shop and formerly operated as a cabinet shop and an automotive repair facility. The historical use of this property could have resulted in subsurface contamination migrating beneath the



subject property if a release occurred at one time beneath the 666 Riverside Avenue parcel and the impacts made it down to groundwater depth. However, there are no known releases at this property and groundwater has been documented to be present at depths greater than 90 feet below grade in the vicinity of the property. Given this information, the current and historical use of the adjacent 666 Riverside Avenue property is not believed to pose a tangible environmental risk to the subject property.

KAS has performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527 at 56 Bright Street and 676 Riverside Avenue, Burlington, and Chittenden County, Vermont. Any exceptions to, or deletions from, this practice are described in Section 11.0 of this report. This assessment has revealed no evidence of recognized environmental conditions in connection with the property except for the following:

- The documented presence of urban fill contaminants in shallow soils beneath the property due to the location of the property within a long time urban environment.

A recognized environmental condition is defined in ASTM E 1527 as "the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment."

A sufficient amount of historical information has been gathered to ascertain the presence or absence of RECs on the property. No additional investigation is deemed necessary to ascertain the presence or absence of a REC on the property. Should future redevelopment occur at the property in which excess soils will be generated, soils should be handled and managed under an approved Corrective Action Plan. Additionally, any new building structures should be designed to mitigate potential vapor intrusion risks.

## **2.0 INTRODUCTION**

KAS conducted a Phase I Environmental Site Assessment (ESA) of land and premises at 56 Bright Street and 676 Riverside Avenue, in Burlington, Chittenden County, Vermont (property; see Appendix A, Site Location Map<sup>1</sup>, Site Plan<sup>2</sup> and Tax Map<sup>3</sup>). The ESA was conducted pursuant to the American Society of Testing and Materials (ASTM) *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (ASTM E 1527-13). This assessment was conducted for Burlington Housing Authority (client), the entity receiving liability protections under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The owners of the property as of the date of this report are Alex Wolff (56 Bright Street) and Burlington Housing Authority (676 Riverside Avenue).

### **2.1. Purpose**

The purpose of this ESA is to identify recognized environmental conditions (RECs), historical RECs, controlled RECs and de minimis conditions in association with the property as defined and described in the ASTM standard.

### **2.2. Detailed Scope-of-Services**

KAS was engaged by client to conduct a Phase I ESA as defined in ASTM E 1527-13. The Phase I ESA work scope included the following elements:

- A general description of the site and vicinity, current property and adjoining property uses, and description of improvements.
- An evaluation of user supplied information including land records, liens, limitations, specialized knowledge, and valuation information.
- A review of practically reviewable regulatory and historic records in connection with the property.
- A site reconnaissance including general site setting, interior and exterior observations.
- Interviews with owner, site manager, occupants, local government officials and others as available.
- Presentation of Findings, Opinion, Conclusions, Deviations and the results of any out of scope contract obligations between client and KAS.

Unless otherwise stated in Section 12.0 of this document, no invasive environmental testing was conducted, and no assessment or testing of asbestos, lead paint, radon or other structural environmental hazards was conducted. Additional tasks were contracted between KAS and RE, and the methodology, limitations and results are presented in Section 12.0 of this document.

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<sup>1</sup> USGS, 1987

<sup>2</sup> ANR Natural Resources Atlas

<sup>3</sup> City of Burlington

### **3.0 SITE DESCRIPTION**

#### **3.1. Location and Legal Description**

The property is located at the corner of Bright Street and Riverside Avenue in the City of Burlington, Vermont. The property consists of two parcels (040-2-101 and 040-2-098) which contain a total of approximately 0.16 acre and are located within a residential zoning district identified as "Residential – Medium Density" according to the City of Burlington.<sup>4</sup> The approximate property boundary for the Phase I assessment is shown on the Tax Map and Site Plan in Appendix A. The property coordinates are 73:12:29 (deg/min/sec) west longitude and 44:29:22 north latitude.<sup>5</sup> A description of the property's land use history is included in Section 5.4 of this report. The property is improved with one building which is described in Section 3.4 of this report.

The property consists of two parcels containing 0.16 acre, more or less, and being all lands and premises conveyed to Alex Wolff by Warranty Deed of Wanda Robar, dated May 8, 2014 and recorded in Book 1217 at Page 249 (56 Bright Street) and to Burlington Housing Authority by Warranty Deed of Wanda Robar, dated October 5, 2014 and recorded in Book 1260 at Page 3 (676 Riverside Avenue) of the Burlington Land Records.<sup>6</sup>

#### **3.2. Site and Vicinity General Characteristics**

Together the two parcels making up the property form an approximate square shaped lot consisting of approximately 0.16 acre located in a residential zoning district in the City of Burlington. The property is flat throughout and is essentially covered by one residential apartment building or asphalt. Very little green space is present. A small portion of the property along the south side of the building is used as a driveway and the east side of the parcel is used for parking. No other structures or features were noted on the property. Lake Champlain is present approximately 1.0 miles to the west. Surficial groundwater in the vicinity has been documented to be more than 90 feet below grade and the groundwater flow direction in the area has been shown to flow toward the west<sup>7</sup>. The depth to groundwater and groundwater flow direction were not confirmed during this Phase I ESA.

#### **3.3. Current Use of the Property**

The 56 Bright Street parcel is in use for residential housing. The 676 Riverside Avenue parcel is vacant and used as a parking lot for the neighboring 666 Riverside parcel.

#### **3.4. Descriptions of On-Site Structures, Roads and Other Improvements**

The property is occupied by one 2-story structure and an asphalt parking lot. The building would appear to have been constructed in the late 1800's or early 1900's based on its

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<sup>4</sup> City of Burlington Official Zoning Map

<sup>5</sup> EnviroSite

<sup>6</sup> City of Burlington Land Records

<sup>7</sup> ATC, October 2000

appearance and general area development. The building contains two 1-bedroom apartment units with a partial unfinished basement and crawl space.

No other buildings were observed on the property. The 56 Bright Street parcel is served by municipal water supply and wastewater disposal systems, and by overhead electric and telecommunications systems. Heating of the building is by natural gas. The property is accessed off of Bright Street or Riverside Avenue.

### **3.5. Current Uses of Adjoining Properties**

Land uses adjacent to the property as of the date of this assessment were as follows.

- North: Residential housing development
- East: Burlington Housing Authority maintenance garage
- South: Residential housing
- West: Bright Street followed by residential housing

## **4.0 USER SUPPLIED INFORMATION**

### **4.1. Title Records**

The User did not provide title records. KAS reviewed chain of title information for the property at the Burlington City Clerk's Office on June 15, 2018. Records found during the review are provided in Section 5.4.2.

### **4.2. Environmental Liens or Activity and Use Limitations**

No environmental liens were discovered during review of land records. Use limitations, if any, are provided in Table 1 of Section 5.4.2. User did not provide positive information of the existence of environmental liens or use limitations in connection with the property.

### **4.3. Specialized Knowledge**

User did not provide any specialized knowledge regarding the property.

### **4.4. Commonly Known or Reasonably Ascertainable Information**

User did not provide any commonly known or reasonable ascertainable information regarding the property.

### **4.5. Valuation Reduction for Environmental Issues**

User indicated the 56 Bright Street parcel is under consideration for sale; however, no value reduction was noted. The 676 Riverside Avenue parcel is under consideration for redevelopment.

#### **4.6. Owner, Property Manager, and Occupant Information**

Land records show the property owners as Alex Wolff (56 Bright Street) and Burlington Housing Authority (676 Riverside Avenue). The property is managed and maintained by the owners. Two occupants currently reside on the 56 Bright Street parcel.

#### **4.7. Reasons for Performing Phase I**

User provided the following reason(s) for conducting this Phase I ESA: due diligence prior to potential purchase and redevelopment.

#### **4.8. Other User Supplied Information and Documentation**

User did not supply any additional information or documentation (See Section 5.2).

### **5.0 RECORDS REVIEW**

#### **5.1. Standard Environmental Record Sources**

##### *5.1.1 Regulatory Database Search*

KAS contracted with Envirosearch Corporation (Envirosearch) to perform a detailed review of state and federal regulatory records to evaluate the environmental risk associated with the property. The search was conducted using All Appropriate Inquiry standards which comply with ASTM E-1527-13 search criteria. A full copy of the Government Records Report is included in Appendix C. A summary of the pertinent data contained in the report is presented below.

##### Property

The property is not included in the database report for any of the searched categories.

##### Immediately Adjacent Properties

No immediately adjacent properties are included in the government records report except for the 666 Riverside Avenue property identified as Chittenden Taxi. This property is listed as an above ground storage tank (AST) site due to the presence of a 1,000-gallon propane tank.

##### Other Properties

There are several mapped sites listed in the Envirosearch government records report within the specified ASTM search radius. Most of these listings are considered to be too far away to present a potential environmental risk to the property. The closest most notable listings include the following:

- The Vermont Transit Company, located to the east of the property, is included in the database report as a pulled underground storage tank (UST) Site, a Brownfields Site, and a State Listed Hazardous Waste Site. Five 2,000 gallon diesel USTs were removed

in 1987, a 8,000 gallon lube oil UST was removed in 1992, a 1,500 gallon diesel UST was removed in 1992, and a 20,000 diesel UST was removed in 1998. The Vermont Transit Company property was a state listed hazardous waste (SHWS) site due to diesel contamination. The property received a certificate of completion in 2003.

- The Good News Garage, located to the east of the property, is listed as a RCRA conditionally exempt small quantity generator of benzene and waste ethylene glycol based coolants, antifreezes and solutions. No violations were listed.
- The Burlington Housing Authority Maintenance Shop, located at 669 Riverside Avenue which is located northeast of the property, is listed as a Conditionally Exempt Small Quantity Generator for petroleum distillates. No violations are listed on the report. This property is also listed as a historical spills site due to a release of approximately 3 gallons of hydraulic oil in May 2014. The spill was reportedly cleaned up.
- 711 Riverside Avenue, which is located west of the property, is listed as a pulled UST and SHWS Site. A 550 gallon, 1,000 gallon, and 2,000 gallon UST were removed from the property in 2009. The UST conditions are noted as good.
- 35-39, and 47 Bright Street, which is located to the southwest of the property, is listed as a Federal Brownfields Site. According to the report, a Phase I conducted on the properties indicated an adjacent manufacturing facility, landfill, and federal brownfields site to the west, an apparent fill pipe on 35 Bright Street, and an unknown pipe at 47 Bright Street. A Phase II ESA was planned for Spring 2012. The 35 Bright Street property is also listed as a UST Site but no further information is listed.
- 27 Bright Street, which is located to the southwest of the property, is listed as a Federal Brownfields Site and State Listed Hazardous Waste Site which received closure in January 2017. According to the report, the property contained PAH contamination in soils.
- 102 Archibald Street, which is located to the southwest of the property, is indicated to be a State Listed Hazardous Waste Site (SMS # 200443223). The Site has received Sites Management Activity Complete (SMAC) status and was closed in February 2010. The report states that soil at the Site is contaminated with PAHs and metals.
- 134 Archibald Street, which is located to the southwest of the property, is listed as a State Listed Hazardous Waste Site and a Brownfields Site (SMS# 20083807). According to the EDR Report, the property has PAHs and metals contamination in soils above regulatory limits.
- 112-114 Archibald Street is listed as a Federal Brownfields Site. The report states an existing multifamily residential structure undergoing improvements. This property is located to the southwest.
- 30 Bright Street, which is located to the east of the property, is listed as a Spill Site (#WMD114). A former employee of reported the disposal of solvents and refinishing

chemicals down a drain on the property in 2008. The report was closed but no further action was listed.

Based on the information presented in the government records report, none of the above listed sites would appear to present an environmental risk to the property. However, a few of these listings along with some of the nearby SHWS listings were researched more to further evaluate their potential risk to the property. This additional information is presented in Section 5.2.

Several unmapped sites are included in the government records report. Most of these properties are noted to be along streets or roads that are several miles away from the subject property. There are two listings on Riverside Avenue; New England Properties and Burlington Bus Barn. These two listings were reviewed and were determined to not present environmental risk to the property.

## **5.2. Additional Environmental Record Sources**

KAS reviewed available information concerning any nearby hazardous sites on file with the VTDEC. No nearby properties showed up in the VTDEC databases which were not included in the government records report.<sup>8</sup> KAS reviewed several additional environmental record sources regarding the property and/or nearby properties as discussed below:

Subsurface Investigation and Soil Testing Report prepared for the subject property: On June 20, 2018, KAS oversaw the advancement of six soil borings (SB-1 thru SB-6) by Accuworx of Barre, Vermont, at the property. The objective of the work was to evaluate subsurface soils beneath the property in the vicinity of a proposed new building. Three composite laboratory analytical samples were obtained from the six boring locations; one from a shallower location at approximately 6 - 24 inches below surface grade, one from an intermittent depth of approximately 2 – 5 feet below grade and one from a deeper depth at approximately 5 – 7 feet below grade. The samples were submitted for laboratory analysis of various contaminants of concern which are typically found in urban environments and have been found in soils at several properties nearby. The analytical results indicated that the historical presence of the Site within an urban setting appears to have resulted in shallow soil subsurface impacts of PAHs and TPH at levels above residential standards and urban background values. The impacts were shown to be limited to the soil interval at approximately 6-24" below grade which lies below the existing asphalt or sod surfaces. A copy of this report is included in Appendix G.

27 Bright Street, 35-39 Bright Street, 47 Bright Street and 112-114 Archibald Street (SMS #2012-4261, #2013-4351, and #2014-4478): KAS reviewed the Analysis of Brownfields Cleanup Alternatives / Corrective Action Plan prepared for these properties which are present to the south of the subject property.<sup>9</sup> According to the document, shallow soils were found to be impacted with PAHs and metals beneath these properties at levels above regulatory standards. Additionally, the compound tetrachloroethylene (PCE) was detected in soil vapor samples collected beneath the 112-114 Archibald Street property at levels above regulatory screening values. These parcels underwent redevelopment and a corrective action measures

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<sup>8</sup> VTDEC Database

<sup>9</sup> LE Environmental, November 2014

were put in place to address the shallow soil and soil vapor impacts discovered. A copy of this letter can be viewed at <https://anrweb.vt.gov/DEC/ERT/GlobalSearch.aspx>

Vermont Transit Facility (SMS #77-0144): KAS reviewed a Phase II Environmental Site Assessment report prepared for this property available on the VTDEC database.<sup>10</sup> A Phase II was completed to evaluate potential impacts to soils and groundwater beneath this property as a result of historical operations as a Vermont railroad transit facility with engine repair and cleaning, body work and vehicle maintenance. Several soil boring and groundwater monitoring wells were installed. Very little environmental impacts were found to be present in the soils and groundwater. One two wells contained levels of VOCs but at levels below state enforcement standards. The groundwater was found to be present at depths of approximately 90 – 100 feet below surface grade and the groundwater was shown to flow in a general westerly direction. Based on the information reviewed, the historical findings at this property do not appear to present risk to the subject property. A copy of this report can be viewed at <https://anrweb.vt.gov/DEC/ERT/GlobalSearch.aspx>

### **5.3. Physical Setting Sources**

#### *5.3.1 USGS Topographic Map*

The most recent USGS topographic quadrangle maps were reviewed during this assessment (1981 and 2012). No buildings are identified on the maps due to the housing density of the area.<sup>11</sup>

#### *5.3.2 State Geological Maps*

Bedrock in the vicinity of the subject property consists of Cambrian aged Monkton Quartzite. The overburden deposits in the area of the subject property are mapped as Marine Sand.<sup>12</sup>

No Class 2 wetland areas have been identified on the property.<sup>13</sup>

### **5.4. Historical Use Information on the Property and Adjoining Properties**

#### *5.4.1 Standard Historical Sources*

##### Aerial Photographs

KAS reviewed three aerial photographs during this assessment. A May 1962 aerial photograph<sup>14</sup>, an April 1994 aerial photograph<sup>15</sup> and a July 2004 aerial photograph<sup>16</sup> each show the property and adjoining properties developed very similar to that seen in June 2018.

The May 1962 photo depicts surrounding properties similar to current development. However, there appears to possibly be a structure on the 676 Riverside Avenue parcel. A copy of each aerial photo is included in Appendix B.

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<sup>10</sup> ATC, October 2000

<sup>11</sup> USGS 1981 & 2012.

<sup>12</sup> ANR Natural Resource Atlas

<sup>13</sup> *ibid*

<sup>14</sup> Aerial Photograph VT-62-L 9-179, May 9, 1962.

<sup>15</sup> Google Earth Aerial Photograph April 25, 1999.

<sup>16</sup> Google Earth Image July 2003

### Sanborn Fire Insurance Maps

Available Sanborn insurance mapping was acquired and examined during this assessment and the observations are summarized in Table 5-1.<sup>17</sup> Copies of these maps are included in Appendix B.

| Table 5-1: Summary of Sanborn Map Observations |   |
|--|---|
| Year   | Summary of Observations   |
| 1894   | The property contains two dwellings; one on the 56 Bright Street parcel and one on the 676 Riverside Avenue parcel. Neighboring parcels consisted of dwellings in all directions. Further to the east is a wood yard. Further south is a junk yard.   |
| 1900, 1906 & 1912                              | Same general observations as 1894, except the Burlington Traction Co. is shown to be present further to the east.   |
| 1919, 1926                                     | Same general observations as previous except a shed is indicated to be present next to the dwelling on the 676 Riverside Avenue parcel.   |
| 1942, 1950                                     | Same general observations as previous except a poultry slaughtering house and bottling company is located adjacent to the east/southeast and the Burlington Rapid Transit Co. is located further east. The Green Mountain Dairy Products is also shown to be present further south where the junkyard was previously indicated. |
| 1989   | The property is shown to be developed with one dwelling on each parcel.   |

### City Directories

KAS reviewed street directory information<sup>18</sup> for the property and nearby properties. The directories for select years between 1920 and 2000 were reviewed. A residential listing was noted for the two parcels from 1930 – 1984. Starting in the 1990 directory, the 676 Riverside Avenue parcel was listed as vacant. Listings for adjacent parcels generally consisted of residential use except for the 666 Riverside Avenue parcel which was listed as containing Champlain Beverage from 1935 through 1970 and Airport Taxi, Benways, Robar Vermont Charter and Limo in 1990. Jacques Auto Body was also listed at the 666 Riverside Avenue location in the 2000 directory.

### USGS Topographic Maps

KAS reviewed nine historical USGS topographic maps during this assessment to confirm the property status.<sup>19</sup> The maps span the years 1906 to 2015. The 1906 and 1919 maps show property development to be fairly dense in the area of the property. Due to the dense overall development, the remaining maps do not show structures. Copies of the historical topographic maps are included in Appendix B.

### Municipal Records

KAS reviewed the water supply, wastewater permit and stormwater permit state online databases regarding municipal records for the property. No permits or records were found for the property. The property is indicated to be present in an area serviced by the municipal

<sup>17</sup> Envirosite Corp. and Historical Information Gatherers

<sup>18</sup> Manning Street Directory Collection, Vermont Law Library

<sup>19</sup> Envirosite

sewer system.<sup>20</sup> KAS reviewed the building permit history database for the property.<sup>21</sup> No permits or records were found.

#### 5.4.2 Other Historical Sources

KAS reviewed chain of title information for the property at the Burlington City Clerk's office on June 15, 2018. No environmental liens or activity and use limitations were discovered for the property. The property history was ascertained as follows.<sup>22</sup>

| <b>Table 5-2 Property Ownership Summary (676 Riverside Avenue)</b> |  |             |             |             |
|--|--|-------------|-------------|-------------|
| <b>Grantee</b>   | <b>Grantor</b>   | <b>Book</b> | <b>Page</b> | <b>Date</b> |
| Burlington Housing Authority                                       | Wanda C. Robar   | 1260        | 3           | 10/8/2014   |
| Wanda C. Robar   | Final Decree of Distribution of the Estate of Paul L. Robar, Jr. | 1245        | 410         | 6/8/2012    |
| Paul L. Robar, Jr.   | Quit Claim Deed of Pamela J. Randall                             | 616         | 686         | 3/3/1994    |
| Pamela J. Randall  | John B. Randall  | 465         | 80          | 10/9/1992   |
| John B. Randall  | Richard Lucia  | 422         | 366         | 9/19/1990   |
| Richard Lucia  | VT Housing Finance Agency  | 381         | 645         | 5/27/1988   |
| VT Housing Finance Agency  | Leon A. & Susan M. Baker   | 377         | 404         | 2/29/1988   |
| Leon A. & Susan M. Baker   | Larry J. & Jessica J. Bushey                                     | 340         | 696         | 8/27/1986   |
| Larry J. & Jessica J. Bushey                                       | Leo W. Cormier   | 279         | 603         | 12/10/1981  |
| Leo W. Cormier   | RM Rosenberg, Jr.  | 198         | 253         | 6/1/1970    |
| RM Rosenberg, Jr.  | Leo W. & Geonnina Cormier  | 198         | 250         | 6/1/1970    |
| Duff Brown Friedman  | Chittenden Trust Company   | 117         | 124         | 11/1/1940   |
| Chittenden Trust Company   | Israel & Ida Cohen   | 117         | 35          | 6/8/1940    |

| <b>Table 5-3 Property Ownership Summary (56 Bright Street)</b> |                          |             |             |             |
|--|--------------------------|-------------|-------------|-------------|
| <b>Grantee</b>   | <b>Grantor</b>           | <b>Book</b> | <b>Page</b> | <b>Date</b> |
| Alex Wolff   | Wanda Robar              | 1247        | 249         | 5/8/2014    |
| Paul & Wanda Robar   | John R. Finelli          | 933         | 727         | 9/9/2005    |
| John Finelli   | Estate of Ann M. Finelli | 735         | 245         | 5/14/2002   |
| Ann M. Finelli   | James Tomlinson          | 540         | 257         | 2/23/1996   |
| James Tomlinson  | Anne Tomlinson           | 523         | 471         | 4/19/1995   |
| Harris & Mary S. Brown   | Joseph A. McNamara       | 151         | 12          | 11/3/1956   |
| Joseph A. McNamara   | Harris Brown             | NR          | NR          | NR          |

No additional records were found beyond 1940 regarding property ownership.

## 6.0 SITE RECONNAISSANCE

### 6.1 Methodology and Limiting Conditions

On June 15, 2018 Jeremy Roberts, QEP of KAS conducted a site reconnaissance to inspect the property for indications of environmental risks or hazardous conditions. A completed site inspection checklist is included in Appendix D. Photographs of the property are included in Appendix E.

<sup>20</sup> ANR wastewater and stormwater databases

<sup>21</sup> City of Burlington

<sup>22</sup> City of Burlington Land Records

## **6.2. General Site Setting**

### *6.2.1 Current Uses*

The 56 Bright Street parcel contains one multi-unit apartment building which is occupied by two tenants. The 676 Riverside Avenue parcel is vacant and used as a parking lot for the neighboring 666 Riverside parcel.

### *6.2.2 Past Uses*

Based on visual observations it appeared the property was previously used similarly to current day.

### *6.2.3 Current and Past Uses of the Adjoining Properties*

Current uses on the adjoining properties at the time of the site reconnaissance were as noted in Section 3.5 of this report. Past uses of the adjoining properties would appear to be similar to current day based on the site inspection.

### *6.2.4 Current and Past Uses in the Surrounding Area*

The surrounding area uses at the time of the site reconnaissance were as noted in Section 3.2 of this report. Past uses of the surrounding area would likely be similar to what was currently observed. No past uses were evident.

### *6.2.5 Geologic, Hydrogeologic and Topographic Conditions*

The property is essentially covered by the one residential apartment building or asphalt. Very little green space is present. No bodies of water, wetlands or bedrock outcrops were observed on or near the property. No storm water drains were observed on the property.

### *6.2.6 General Description of Structures*

The property is occupied by one structure. See Section 3.4 for more details.

### *6.2.7 Roads*

The property has curb access from Bright Street on the west side of the property and Riverside Avenue on the north side.

### *6.2.8 Potable Water Supply*

The property is supplied by municipal water.

### *6.2.9 Sewage Disposal System*

The property is supplied by municipal sewer.

### **6.3. Interior and Exterior Observations**

#### *6.3.1 Current and Past Usage*

See Sections 6.2.1 and 6.2.2. KAS physically examined all of the common interior spaces, basement space and each apartment unit.

#### *6.3.2 Hazardous Substances and Petroleum Products and Unidentified Containers*

De minimis quantities (<5 gallons) of paints and household cleaners were observed in the building. All these materials were observed to be stored properly and labeled with no evidence of leaks or spills. No other hazardous substances or petroleum products were observed within the building.

#### *6.3.3 Storage Tanks*

No storage tanks were noted on the property.

#### *6.3.4 Odors*

No odors were observed.

#### *6.3.5 Pools of Liquid*

No pools of liquid were observed during the site reconnaissance.

#### *6.3.6 Drums*

No drums were observed on the property.

#### *6.3.7 PCBs*

No obvious sources of PCB containing equipment were observed on the property.

### **6.4. Interior Observations**

#### *6.4.1 Heating and Cooling*

Heating of the building is via a boiler supplied by natural gas.

#### *6.4.2 Stains and Corrosion*

No stains or corrosion were noted.

#### *6.4.3 Drains and Sumps*

No floor drains were noted within the building except for a small drainage hole noted to be present next to the furnace. A condensation line from the furnace was draining into this hole.

### **6.5 Exterior Observations**

#### *6.5.1 Pits, Ponds and Lagoons*

None observed.

#### 6.5.2 *Stained Soil or Pavement*

None observed.

#### 6.5.3 *Stressed Vegetation*

None observed.

#### 6.5.4 *Solid Waste*

None observed.

#### 6.5.5 *Drains and Waste Water*

None observed on the property. Catch basins for storm water collection were noted along the nearby streets.

#### 6.5.6 *Wells*

None observed.

#### 6.5.7 *Septic Systems*

None observed.

## **7.0 INTERVIEWS**

### **7.1 Interview with Property Owners**

Mr. Alex Wolff, owner of 56 Bright Street and Mr. Christopher Barrett, owner's representative for 676 Riverside Avenue, completed a KAS interview questionnaire on July 11 and July 26, 2018, respectively (Appendix F). Important points raised during these interviews included the following.

- The 56 Bright Street property is currently being used and has historically been used as residential housing. There are no other known uses.
- The 676 Riverside Avenue property is currently vacant and consists of a paved lot. It previously housed a single family home.
- They both are not aware of any spills or releases that have occurred at the property.
- They both are not aware of any storage or hazardous materials on the property.

### **7.2. Interview with Property Occupants**

On June 15, 2018, KAS interviewed Mr. John Templeton, who is the property maintenance manager for the owner of 56 Bright Street. Mr. Templeton was interviewed regarding current and past building occupancy and usage. He indicated the building is currently occupied by two tenants. To his knowledge the tenants have not used or stored hazardous materials. He is not aware of any spills associated with these batteries.

### **7.3. User Interview**

Mr. Christopher Barrett, Director of Properties for Burlington Housing Authority, completed a KAS User Questionnaire (Appendix F) on July 26, 2018. Mr. Barrett indicated he is not aware

of any environmental liens or activity and use limitations for the property or of any spills or releases that have occurred on the property. According to Mr. Barrett, Burlington Housing Authority is exploring options for potential purchase and redevelopment and as such, are having the property evaluated for environmental conditions.

#### **7.4. Interview with Local Government Officials**

In order to request information on potential spills and/or hazardous materials incidents associated with the property, KAS contacted the Burlington Fire Department (FD) on July 16, 2018 (Appendix F). The FD has no records of responding to the 56 Bright Street or 676 Riverside Avenue locations or at any of the adjacent parcels.

#### **7.5. Interview with Others**

No other interviews were conducted; the past owners could not be found.

### **8.0 FINDINGS**

This assessment has revealed that the property presents one REC as presented in Section 10.0.

#### **8.1 Non-ASTM Scope Items**

Several renovations have reportedly occurred within the 56 Bright Street building over time. Given the age of the building, asbestos containing materials (ACM) may be present. As required by state and federal regulations, building materials suspect for asbestos must be presumed ACMs, until sampled and proven otherwise.

The building is reportedly pre 1978 construction therefore painted surfaces should be assumed to contain lead based paint unless proven otherwise.

No obvious visible mold was observed at the time of the inspection.

According to the Envirosearch database report, the average radon test result within the area is 1.71 picocuries per liter (pCi/L) and 0.9 pCi/L, for the basement level and first floor, respectively.<sup>23</sup> The average levels are below the EPA action limit of 4 pCi/L. Site-specific testing would be required to determine radon levels inside any current or future buildings.

The property is serviced by the Burlington municipal water supply therefore there is little concern for lead or other contaminants to be present in the drinking water. However, sampling would be required to determine if lead or other contaminants are present in the water source.

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<sup>23</sup> EDR Radius Report

## **9.0 OPINION**

KAS has reviewed available environmental data concerning the property and has determined that current or past uses of the property do not present material threat of a release of hazardous substances and/or petroleum products.

Land development in the vicinity of the property began in the 1800's. Historic fill has been known to be used during this time frame in Burlington/urban areas. Historic fill material can be composed of many different elements like wood, coal ash, construction demolition material, and residue from paint, fertilizers, gasoline, and other products. Common contaminants associated with historic fill such as PAHs, TPH and metals, all of which could pose a risk to human health and the environment if not handled appropriately, were discovered in shallow soils beneath the property in June 2018 (see Appendix G). The identified presence of impacts to shallow soils beneath the property is considered to be a REC.

There are a number of nearby properties with environmental interest. Low to moderate levels of various chlorinated volatile organic compounds (CVOCs) have been documented to be present in soil vapors beneath several of these nearby properties and many other properties in Burlington. At many locations, the source of these CVOCs is not clear. It is possible the source is from the many historical dry cleaning and/or automobile repair garage facilities located throughout Burlington over the years. The potential for similar conditions to exist beneath the subject property cannot be fully ruled out; however, as no release of CVOCs has been documented at or near the property, this condition is considered to be de minimis.

There are a number of nearby sites of environmental interest which do not appear to pose tangible environmental risk to the property based on their identified contaminants, regulatory status, distance and/or direction to the property.

The adjacent property to the east (666 Riverside Avenue) currently operates as a maintenance shop and formerly operated as a cabinet shop and an automotive repair facility. The historical use of this property could have resulted in subsurface contamination migrating beneath the subject property if a release occurred at one time beneath the 666 Riverside Avenue parcel and the impacts made it down to groundwater depth. However, there are no known releases at this property and groundwater has been documented to be present at depths greater than 90 feet below grade in the vicinity of the property. Given this information, the current and historical use of the adjacent 666 Riverside Avenue property is not believed to pose a tangible environmental risk to the subject property.

A sufficient amount of historical information has been gathered to ascertain the presence or absence of RECs on the property. No additional investigation is deemed necessary to ascertain the presence or absence of a REC on the property. Should future redevelopment occur at the property in which excess soils will be generated, soils should be handled and managed under an approved Corrective Action Plan. Additionally, any new building structures should be designed to mitigate potential vapor intrusion risks.

## **10.0 CONCLUSIONS**

KAS has performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527 at 56 Bright Street and 676 Riverside Avenue, Burlington, and Chittenden County, Vermont. Any exceptions to, or deletions from, this practice are described in Section 11.0 of this report. This assessment has revealed no evidence of recognized environmental conditions in connection with the property except for the following:

- The documented presence of urban fill contaminants in shallow soils beneath the property due to the location of the property within a long time urban environment.

A REC is defined in ASTM E 1527 as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property:

- 1) due to release to the environment;
- 2) under conditions indicative of a release to the environment; or
- 3) under conditions that pose a material threat of a future release to the environment.

## **11.0 LIMITING CONDITIONS / DEVIATIONS**

### **11.1. Limiting Conditions/Deviations/Data Gaps**

Noted limiting conditions to the ASTM Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (ASTM E 1527-13) included the following: none.

Noted deviations to the ASTM Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (ASTM E 1527-13) included the following: none.

Data gaps were not encountered except that the historical record did not extend to before first developed use of the property. Given the documented long term unchanged property use as residential, this situation is not deemed to be material to the outcome of the assessment.

### **11.2. Significant Assumptions**

KAS undertook performance of this Phase I ESA according to the following assumptions: none.

### **11.3. Limitations and Exclusions**

KAS has prepared this Phase I ESA report in accord with ASTM E 1527-13 using the best efforts of Environmental Professionals and information available at the time of preparation. This report is intended to convey a point-in-time environmental evaluation of the property, as well as relevant information on past uses. The user of this document must recognize the

limitations inherent in conducting a Phase I ESA, as stated in ASTM E 1527-13, which include but are not necessarily limited to:

- This document does not address regulatory compliance issues and KAS makes no assurances relative to the federal, state or local regulatory compliance of the property (ref. Section 1.4).
- Uncertainty Not Eliminated: No environmental site assessment can wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with a property. Performance of this practice is intended to reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions in connection with a property, and this practice recognizes reasonable limits of time and cost (ref. Section 4.5.1).
- All appropriate inquiry as defined by ASTM E 1527-13 is not an exhaustive assessment of a property (ref. Section 4.5.2).
- A variable level of inquiry may be conducted depending on the specific characteristics and features of the property and the information developed during the course of the assessment (ref. Section 4.5.3).
- An assessment meeting or exceeding the requirements of ASTM E 1527-13 and completed less than 180 days prior to the date of acquisition or intended transaction is presumed to be valid (ref. Section 4.6).
- All appropriate inquiry as defined by ASTM E 1527-13 is not exhaustive and does not require assessment of historic uses more frequently than every five years (ref. Section 8.3.2.1).

#### **11.4. Special Contractual Conditions**

None.

#### **11.5. User Reliance**

This report is for the use and benefit of client as defined herein. Affiliates of client, and third parties authorized in writing by KAS and client, may rely upon this report to the extent that client is entitled to do so, provided said parties agree to abide by the limitations and exclusions as stated herein.

### **12.0 ADDITIONAL SERVICES**

In addition to the Phase I ESA, KAS was contracted by Burlington Housing Authority (BHA) to perform a Tier 1 Vapor Encroachment Screening (VES) and subsurface soil testing. Following are the results of the Tier 1 VES. The report documenting the results of the subsurface soil testing can be found in Appendix G.

KAS performed a Tier 1 Vapor Encroachment Screening (Tier 1 VES) of land and buildings at 56 Bright Street and 676 Riverside Avenue in Burlington, Vermont per ASTM E2600-10. In conjunction with the Tier 1 VES, KAS completed a Phase I ESA for BHA. The findings of this vapor encroachment screening are based on data collected for the Phase I ESA. The Tier 1 VES was conducted pursuant to the American Society of Testing and Materials (ASTM)

*Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions* (ASTM E2600-10).

### 12.1. Purpose

The purpose of conducting a Tier 1 VES as established by ASTM E2600-10 on a parcel of property is to identify a vapor encroachment condition (VEC), which is the presence or likely presence of contaminant of concern (COC) vapors in the subsurface of the target property (TP) caused by the release of vapors from contaminated soil or groundwater either on or near the TP.

### 12.2. Detailed Scope-of-Services

KAS was engaged by client to conduct a Tier 1 VES as defined in ASTM E2600-10. No invasive environmental testing was conducted. The work scope included the following elements:

- Collection of specific data as specified in the ASTM method.
- Review of specified governmental records.
- Review of available environmental information.
- Review of available current and historical use information.
- Performance of the Tier 1 evaluation and development of appropriate findings, conclusions and recommendations.

### 12.3. Significant Assumptions

KAS undertook performance of this Tier 1 VES assuming that the data contained in the Phase I ESA report is fully usable and that permission to do so has been granted by RuralEdge.

### 12.4. Limitations and Exceptions

KAS has prepared this Tier 1 VES report in accordance with ASTM E2600-10 using the best efforts of Environmental Professionals and information available at the time of preparation. This report is intended to convey a point-in-time evaluation. The user of this document must recognize the limitations inherent in conducting a Tier 1 VES as stated in ASTM E2600-10, which include but are not necessarily limited to:

- Compliance: This guide does not address requirements of any federal, state, or local laws with respect to vapor intrusion. Users are cautioned that federal, state, and local laws, regulations, or policy may impose vapor encroachment screening or vapor intrusion assessment obligations that are beyond the scope of this guide. Users should also be aware that there may be other legal obligations, for example, disclosure, with regard to contaminant of concern (COC) or COC vapors discovered on the TP that are not addressed in this guide. (ref. Section 1.1.2).
- Property Specific: This guide is property specific in that it relates to screening of VECs associated with a specific parcel of real estate. Consequently, this guide does not address many additional issues raised in transactions such as purchases of business entities or interests therein, or of their assets, that may well involve environmental liabilities pertaining to properties previously owned or operated or other off-site

environmental liabilities. The guide does not replace a Phase I ESA conducted by an environmental professional or any obligation of the environmental professional under Practice E1527 to identify all recognized environmental conditions (RECs) related to the TP (ref. Section 4.2.3.).

- **Uncertainty Not Eliminated:** No vapor encroachment screen can wholly eliminate uncertainty regarding the identification of VECs in connection with a TP. Screening is intended to reduce, but not eliminate, uncertainty regarding whether or not a VEC exists in connection with a property. (ref. Section 4.5.1).
- **Not Exhaustive:** The guide is not meant to be an exhaustive screening. There is a point at which the cost of information obtained or the time required to gather it outweighs the usefulness of the information and, in fact, may be a material detriment to the orderly completion of real estate transactions. One of the purposes is to identify a balance between the competing goals of limiting the costs and time demands inherent in performing a VES and the reduction of uncertainty about unknown conditions resulting from additional information. (ref. Section 4.5.2).
- **Variable Level of Inquiry:** Not every property will warrant the same level of screening. The appropriate level of screening should be guided by the type of property subject to screening and the information already available or developed in the course of the investigation. (ref. Section 4.5.3).
- **Continued Viability:** Subject to subsection 4.7, a VES conducted according to the procedures presented in this guide and completed less than 180 days before the date of acquisition of the property or, for transactions not involving an acquisition, the date of the intended use of the VES, is presumed to be valid. Subject to subsection 4.7 and the user's responsibilities set forth in Section 6, a VES conducted according to the procedures presented in this guide and for which the information was collected or updated within one year before the date of acquisition of the property or, for transactions not involving an acquisition, the date of the intended use of the VES may be used provided that the following components of the investigation were conducted or updated within 180 days of the date of purchase or the date of the intended transaction: (ref. Section 4.6).

## 12.5 Records Review

### 12.5.1 Regulatory Database Search

KAS reviewed relevant governmental records via the Envirosearch Government Records Report dated June 22, 2018, with confirmation of select properties via the Vermont Department of Environmental Conservation (DEC) on-line hazardous sites locator (<http://www.anr.state.vt.us/W MID/HazSites.aspx>). Findings made were as follows:

The approximate minimum search distance for petroleum related contamination is 500 feet per ASTM E2600 at §8.3.2. For the property, this search radius encompasses properties along and adjacent to Riverside Avenue, Bright Street and near Intervale Avenue. Two known petroleum impacted properties were identified within a 500 feet search radius from the property (Vermont Transit and 711 Riverside Avenue). Based on information reviewed, these two properties have received regulatory closure and there are no known groundwater plumes associated with the petroleum release identified at each of these properties.

The approximate minimum search distance for non-petroleum chemicals of concern is 1/3 mile per ASTM E2600 at §8.3.2. Within this search radius lies several properties the majority of which are clustered around Bright Street, Archibald Street and North Winooski Avenue. This search radius also extends towards the northeast where it abuts the Winooski River. Nine known non-petroleum impacted properties were identified within a 1/3 mile search radius from the property.

No other listings within 500 feet for petroleum sites or 0.33 miles for non-petroleum sites were identified in the Envirosearch database report or using the DEC on-line hazardous sites locator tool.

#### 12.5.2 Additional Environmental Record Sources

Following is a list of the documents examined during the additional research phase of KAS' work:

- Analysis of Brownfields Cleanup Alternatives/Corrective Action Plan for the Bright Street Co-op (27 Bright Street, 35-39 Bright Street and 47 Bright Street) dated November 2014<sup>24</sup>
- Certificate of Completion for 27 Bright Street, 35-39 Bright Street, 47 Bright Street and 112-114 Archibald Street dated January 19, 2017<sup>25</sup>
- Phase II Environmental Site Assessment for the Former Gracey Roofing site dated November 10, 1993<sup>26</sup>
- Additional Site Investigation for the Former Bushey Auto property dated June 2013<sup>27</sup>.
- Site Investigation Report for the former North End Dry Cleaner site dated October 1994<sup>28</sup>
- Phase II Environmental Site Assessment Report for the former Q-Tees Restaurant dated May 2013<sup>29</sup>
- Analysis of Brownfields Cleanup Alternatives/Corrective Action Plan for 230-242 North Winooski Avenue property dated October 2015<sup>30</sup>
- Site Investigation Report for the former Howard Bank property dated November 1991<sup>31</sup>
- Phase II Environmental Site Assessment Report for the 208-212 North Winooski Avenue property dated November 2016<sup>32</sup>

All of these reports generally indicate similar conditions were found in shallow soil vapor beneath each of the properties with many of the properties exhibiting levels of tetrachloroethylene (PCE) in soil vapor above regulatory standards. The majority of these properties are located along North Winooski Avenue; however, PCE impacts in shallow soil vapor above regulatory standards were also noted along Archibald Street and Bright Street. The source of the PCE soil vapor impacts is not abundantly clear based a review of the reports

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<sup>24</sup> LE Environmental, November 2014

<sup>25</sup> VTDEC, January 2017

<sup>26</sup> Con Test, Inc. November 1993

<sup>27</sup> Waite-Heindel, June 2013

<sup>28</sup> Wagner, Heindel & Noyes, October 1994

<sup>29</sup> KAS, May 2013

<sup>30</sup> LAG, October 2015

<sup>31</sup> Johnson Company, November 1991

<sup>32</sup> Practical Environmental Solutions, November 2016

and it appears there may be many historical sources contributing to the presence of PCE in shallow soil vapors within these areas over time.

### 12.5.3 *Standard Historical Sources*

Historical records reviewed during the Tier 1 VES included Sanborn Insurance Maps, historical and more recent aerial photographs and historical and recent USGS topographic maps. These sources indicated the historical property use was residential. No commercial use of the property was noted.

An expanded review was performed to accommodate the search radius requirements of the Tier 1 VES. Two historical gasoline filling stations were noted within a 500 feet radius from the target property. One was shown on the 1942 Sanborn map and was located at the corner of North Winooski Avenue and Riverside Avenue to the east of the property. No other gasoline filling stations were noted. The other station was shown to the east of the property at 358 North Winooski Avenue. Both of these properties are believed to be a sufficient distance away from the subject property to not be of concern for vapor migration.

No dry cleaning establishments were noted within the coverage area of the Sanborn maps acquired for the Phase I ESA. A fair amount of industrial development and property uses were noted on the Sanborn maps to the east of the property. A junk yard/auto junk yard was noted at 38 Bright Street, approximately five properties away from the subject property. No other properties of concern were noted during review of the Sanborn maps, aerial photographs, or topographic maps.

## 12.6 Findings

The findings of the research and assessment completed for the Tier 1 VES are summarized as follows:

- The Phase I ESA identified one recognized environmental condition; the documented presence of urban fill contaminants in shallow soils beneath the property;
- The Phase I ESA identified one de minimis condition; the documented presence of low to moderate levels of various CVOCs in soil vapors beneath several properties in the general vicinity of the subject property;
- Two properties with petroleum contamination were identified within 500 feet to the property, and several properties with non-petroleum contamination were identified within 1/3 mile of the property;
- Based on information reviewed, the two properties with petroleum contamination have received regulatory closure and there are no known groundwater plumes associated with the petroleum releases at these properties;
- A review of the environmental reports for the non-petroleum impacted properties identified within 1/3 mile of the subject property generally indicate similar conditions were found in shallow soil vapor beneath each of the properties with many of the properties exhibiting levels of PCE in soil vapor above regulatory standards. The source of the PCE soil vapor impacts is not abundantly clear based a review of the

reports and it appears there may be many historical sources contributing to the presence of PCE in shallow soil vapors within these areas over time;

- Two historical gasoline filling stations were noted with 500 feet of the subject property; and,
- No other listings within 500 feet for petroleum contaminated sites or 0.33 miles for non-petroleum contaminated sites were identified in the government records report.

## **12.7 Conclusions**

KAS has determined that a VEC to the TP cannot be ruled out based on this work. This conclusion is based on the determination that most of the identified sites within the ASTM-prescribed search radii have documented non-petroleum impacts to shallow soil vapors. The potential for similar conditions to be present at or in the immediate vicinity of the TP cannot be fully ruled out based on existing data.

## **12.8 Opinion**

The Tier I VES has concluded that a vapor intrusion risk to the TP cannot be ruled out; however, a Tier 2 VES is not recommended as it is believed testing would not supply additional benefit for redevelopment at this time. Should redevelopment proceed the collection of soil vapor data should be considered prior to finalizing building designs so that any potential vapor intrusion risks are fully mitigated.

## **12.9 Deviations**

No deviations were noted.

## **13.0 REFERENCES**

United States Geological Survey (USGS), Topographic Map of Burlington, Vermont, 1987, viewed on line at <http://www.topoquest.com>

City of Burlington Land Records viewed in person at the Burlington City Clerk's office, Burlington, Vermont, in person on June 15, 2018

City of Burlington, Vermont Tax Map obtained on line at <https://www.burlingtonvt.gov/>

Government Records Report for 56 Bright Street/676 Riverside Avenue, Burlington, Vermont June 22, 2018, Envirosite Corporation, Westport, CT

Aerial Photograph of Burlington, Vermont April 25, 1999, viewed on line at <http://terraserver.microsoft.com>

Johnson/Manning Street Directories for select years from 1920 to 2000, viewed in person at the Vermont Law Library, State Street, Montpelier, Vermont.

United States Geological Survey Map of Burlington, Vermont, July 1987, obtained from [www.msrmmaps.com](http://www.msrmmaps.com)



Aerial Photograph VT-62-L 9-178, May 9, 1962, obtained at the Vermont Law Library, State Street, Montpelier, Vermont.

Google Earth Imagery of Burlington, Vermont 2016

Sanborn Fire Insurance Maps of Burlington, Vermont, obtained from First Search Technology Corporation on November 11, 2011.

VANR Natural Resources Atlas, viewed online at <http://anrmaps.vermont.gov/websites/anra/>.

KAS, Inc. Phase I ESA User Interview with Mr. Christopher Barrett, Director of Properties for Burlington Housing Authority, July 26, 2018

KAS, Inc. Phase I ESA owner interview with Mr. Alex Wolff, owner of 56 Bright Street, July 11, 2018

KAS, Inc. Phase I ESA owner interview with Mr. Christopher Barrett, representative of Burlington Housing Authority, July 26, 2018

ATC Associates, Inc. Phase II Environmental Site Assessment, Vermont Transit Trolley Barns, 2000

LE Environmental November 2014 Analysis of Brownfields Cleanup Alternatives / Corrective Action Plan prepared for the 27 Bright Street, 35-39 Bright Street, 47 Bright Street and 112-114 Archibald Street properties dated November 25, 2014 available for review at <https://anrweb.vt.gov/DEC/ERT/GlobalSearch.aspx>

Practical Environmental Solutions Phase II Environmental Site Assessment Report prepared for the 208-212 North Winooski Avenue property dated November 22, 2016 available for review at <https://anrweb.vt.gov/DEC/ERT/GlobalSearch.aspx>

Lincoln Applied Geology Analysis of Brownfields Cleanup Alternatives / Corrective Action Plan prepared for the 230-242 North Winooski Avenue property dated October 7, 2015 available for review at <https://anrweb.vt.gov/DEC/ERT/GlobalSearch.aspx>

ATC Associates, Inc. Phase II Environmental Site Assessment Report prepared for the Vermont Transit property dated October 12, 2000 available for review at <https://anrweb.vt.gov/DEC/ERT/GlobalSearch.aspx>

Waite-Heindel Environmental Management Additional Site Investigation Report prepared for the Former Bushey Auto property dated June 6, 2013 available for review at <https://anrweb.vt.gov/DEC/ERT/GlobalSearch.aspx>

Contest Environmental Consulting Phase II Environmental Site Assessment Report prepared for the Former Gracey Roofing property dated November 10, 1993 available for review at <https://anrweb.vt.gov/DEC/ERT/GlobalSearch.aspx>



The Johnson Company Continuing Site Investigation Report prepared for the Former Howard Bank property dated November 1991 available for review at  
<https://anrweb.vt.gov/DEC/ERT/GlobalSearch.aspx>

Waite, Heindel & Noyes, Inc. Supplemental Investigation Report prepared for the Former North End Dry Cleaners property dated October 1994 available for review at  
<https://anrweb.vt.gov/DEC/ERT/GlobalSearch.aspx>

#### **14.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS**

I hereby certify that this Phase I Environmental Site Assessment report, as presented, is a complete and accurate record of my findings, to the best of my knowledge.

Prepared by:



Jeremy Roberts, Environmental Professional

#### **15.0 QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONALS**

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in §312.10 of this part. I have the specific qualifications based on education, training and experience to assess a property of the nature, history and setting of the subject property. I have developed and performed the All Appropriate Inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.



Jeremy Roberts, Environmental Professional



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802.383.0486 p  
802.383.0490 f

July 16, 2018

Mr. Christopher Barrett, Director of Properties  
Burlington Housing Authority  
65 Main Street  
Burlington, Vermont 05401

RE: Subsurface Investigation and Soil Testing, BHA Proposed Housing Project,  
56 Bright Street/676 Riverside Avenue, Burlington, Vermont

Dear Mr. Barrett:

The following summarizes the subsurface investigation and soil testing activities completed by KAS, Inc. (KAS) at the above listed properties. This work scope was completed in accordance with KAS' Proposal dated May 21, 2018 and the Professional Services Agreement between KAS and Burlington Housing Authority (BHA) dated May 31, 2018. The work was approved by BHA for implementation on June 6, 2018.

#### **BACKGROUND**

BHA is currently in the preliminary stages of planning to construct a new three story apartment complex at the corner of Bright Street and Riverside Avenue ("Site"). The preliminary plans include the demolition of the existing 56 Bright Street apartment building followed by the construction of a new building on the 676 Riverside Avenue parcel. In order to properly plan for soil management activities, the advancement of soil borings and laboratory testing was requested to evaluate subsurface soils in the vicinity of the proposed new structure.

#### **WORK SCOPE**

KAS conducted subsurface testing in accordance with the approved work scope and authorization from BHA. The work scope included:

- Project coordination and Health and Safety Plan (HASP) Preparation;
- Pre-marking for DigSafe notification;
- Soil boring advancement and soil field screening;
- Laboratory analysis of soil samples; and,
- Preparation of a summary report outlining the findings (this document).

Details of each task are provided below. The objective of the work scope was to provide data to determine if contaminants of concern are present in soils. The contaminants of concern consist of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), metals and/or polychlorinated biphenyls (PCBs) in subsurface soils; which are commonly present in urban environments and have been noted in soils at several locations in close proximity to the Site.

#### **Project Coordination / DigSafe Notification**

KAS coordinated with BHA to gain access to the property to conduct the work scope. The area of exploration was pre-marked prior to drilling pursuant to



Mr. Christopher Barrett  
July 16, 2018  
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DigSafe requirements. A DigSafe number was obtained (#20182416580) prior the subsurface work taking place. KAS also notified the City of Burlington Public Works to locate service utility lines and other lines that may exist on the property which may not have been marked by DigSafe.

#### Soil Borings and Soil Screening

On June 20, 2018, KAS oversaw the advancement of six soil borings (SB-1 thru SB-6) by Accuworx of Barre, Vermont, in the vicinity of the proposed new building foundation at the corner of Bright Street and Riverside Avenue. The soil borings were advanced using a direct push drill rig equipped with a macrocore sampling system, following KAS Protocol #004.<sup>1</sup> Soil boring locations are presented on the attached Site Plan.

Undisturbed soil samples/cores were collected continuously down to the base of each boring (15 feet below grade). The soil cores were logged by a KAS senior scientist and screened for the presence of VOCs using a MiniRae PID equipped with a 10.6 eV lamp which was calibrated with isobutylene referenced to benzene prior to drilling activities. Soils were screened using the KAS Protocol #001.<sup>2</sup>

No petroleum or solvent odors were noted in any of the samples collected during the advancement of the borings. PID screening values for these borings ranged from 0.0 to 2.0 parts per million by volume (ppmv).

The subsurface sediments predominately consisted of dry, brown, poorly graded fine to coarse sand. A perched water table was noted in all of the borings at approximately 12 – 13 feet below grade. Only one boring location (SB-4) was noted to contain signs of non-native fill material (brick). See attached Soil Boring Data Summary.

#### Soil Sampling

Three composite laboratory analytical samples were obtained from the six boring locations; one from a shallower location at approximately 6 - 24 inches below surface grade, one from an intermittent depth of approximately 2 – 5 feet below grade and one from a deeper depth at approximately 5 – 7 feet below grade. The soil samples were collected according to KAS Protocol #006.<sup>3</sup> Three grab soil samples were collected for VOC analysis; one from SB-4 at 1 – 2 feet below grade, one from SB-5 at 3 – 5 feet below grade and one from SB-4 at 5 – 6 feet below grade. These grab soil samples correlated with the highest PID readings recorded at each interval (shallow, intermediate and deep).

The samples were transported under chain of custody procedures to Eastern Analytical Laboratories (EAL) for laboratory analysis. The analysis was completed so that the soil data could possibly be used later for waste characterization samples in the event the soil is impacted and needs to be shipped offsite for disposal. The samples were analyzed for the following:

- VOCs via EPA Method 8260c (grab samples only);

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<sup>1</sup> KAS Protocol #004: Soil Borings

<sup>2</sup> KAS Protocol #001: Soil Screening Headspace Measurement

<sup>3</sup> KAS Protocol #006: Sample Containerization, Preservation, Handling and Packaging



Mr. Christopher Barrett  
July 16, 2018  
Page 3

- Total petroleum hydrocarbons (TPH) via EPA Method 8100;
- Semi-volatile organic compounds (SVOCs) via EPA Method 8270d;
- RCRA 8 metals via EPA Method 6010/6020;
- Polychlorinated Biphenyls (PCBs) via EPA Method 8082A; and,
- Corrosivity/pH via EPA Method 9045.

After the soil samples were collected, drill cuttings were backfilled in the point of origin and each borehole was finished with cold patch or sand to match the existing surface.

#### Analytical Results of Subsurface Soil Samples

Only one VOC (Styrene) was detected in soil boring SB-4 from 1 – 2 feet below grade, at a level well below the screening level for residential sites. Several SVOCs and polynuclear aromatic hydrocarbons (PAHs) were detected in SS-1 (6-24") and SS-2 (2-5'), with benzo(a)pyrene (BaP) and dibenzo(a,h)anthracene exceeding the screening levels for residential sites in the SS-1 (6-24") sample only. PAHs expressed as the toxic equivalent quotient (TEQ) for BaP exceeded the background level soil concentration for urban sites in the SS-1 (6-24") sample. The TEQ for BaP was below the soil concentration for urban sites in the SS-2 (2-5') and SS-3 (5-7') samples. Several metals were reported; however, all were below the screening levels for residential sites. The total petroleum hydrocarbon (TPH) level reported in SS-1 (6-24") exceeded the residential screening value range. No PCBs were reported above laboratory detection limits. The tabulated soil analytical results and the soil laboratory analytical report are attached.

#### **CONCLUSIONS AND RECOMMENDATIONS**

The historical presence of the Site within an urban setting appears to have resulted in shallow soil subsurface impacts of PAHs and TPH. The impacts above residential standards and urban background values appear to be limited to approximately 6 – 24" soil interval lying below the existing asphalt or sod surfaces. Due to the presence of elevated levels of PAHs and TPH in the shallow subsurface soils scheduled to be disturbed during future redevelopment, it is recommended that the soils be managed and handled appropriately during construction in accordance with a Corrective Action Plan approved by the VT DEC. The soil analytical data and findings of the subsurface testing should be reported to the VT DEC.

KAS appreciates the opportunity to conduct this work for BHA. Please call or e-mail me at [JeremyR@kas-consulting.com](mailto:JeremyR@kas-consulting.com) if you have any questions.

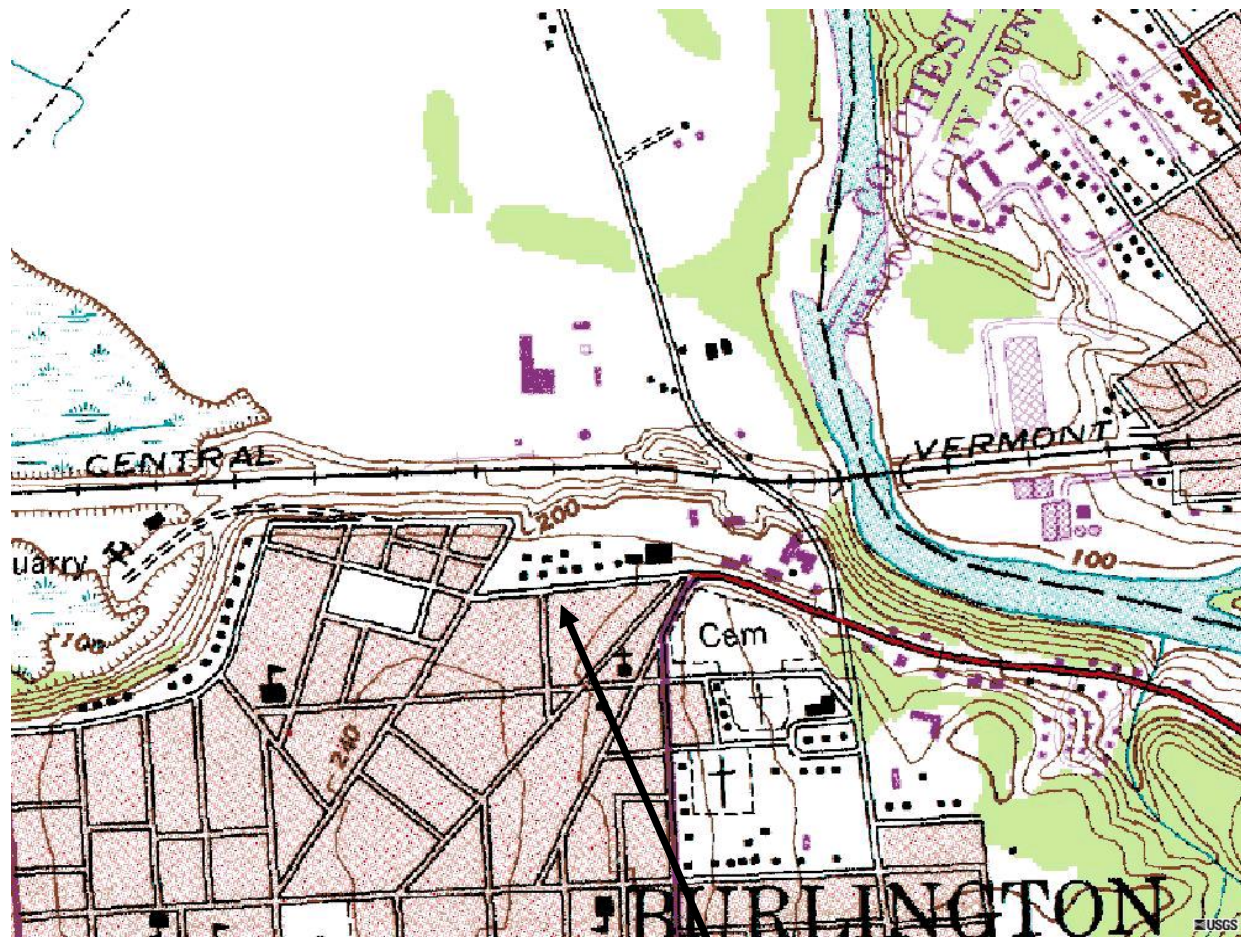
Sincerely,

A handwritten signature in black ink, appearing to read "J. Roberts", written over a horizontal line.

Jeremy Roberts, P.G.  
Principal / Environmental Program Manager

cc: KAS #505180495

Attachments: Site Location Map, Site Plan, Soil Boring Data, Soil Analytical Summary & Laboratory Report



N

**SUBJECT  
PROPERTY**

KAS Job Number

505180495

Source:

[www.topoquest.com](http://www.topoquest.com)



**56 Bright St / 676 Riverside Avenue  
Burlington, VT**

Site Location map  
1981 USGS Map

Date: 05/09/14

Drawing No. 0

Scale: nts

By: JR



Approximate Soil Boring Location

KAS Job Number 505180495  
Source: Google Earth



## BHA Proposed Housing Project

56 Bright St / 676 Riverside Ave, Burlington, VT

Site Plan w/ Soil Boring Locations

|                |               |            |        |
|----------------|---------------|------------|--------|
| Date: 07/16/18 | Drawing No. 0 | Scale: nts | By: JR |
|----------------|---------------|------------|--------|



Soil Boring Data Summary  
Proposed BHA Housing Project  
6/20/18

| Soil Boring # | Soil Sample # | Run Depth (feet bg) | Group Name                        | PID (ppmv) | Comments / Observations                     |
|---------------|---------------|---------------------|-----------------------------------|------------|---|
| SB-1          | -             | 6 - 12"             | Silty Sand                        | 0.0        | Asphalt surface (~3" asphalt w/ 3" subbase) |
|               | -             | 1 - 2'              | Poorly Graded Sand                | 1.1        |   |
|               | -             | 2 - 5'              | Poorly Graded Sand                | 0.2        |   |
|               | -             | 5 - 7'              | Poorly Graded Sand with Gravel    | 0.0        |   |
|               | -             | 7 - 10'             | Poorly Graded Sand with Gravel    | 0.0        |   |
|               | -             | 10 - 12'            | Poorly Graded Coarse Sand         | 0.2        |   |
|               | -             | 12 - 15'            | Poorly Graded Coarse to Fine Sand | 0.3        | Coarse sand w/ perched water 12 - 13'       |
| SB-2          | -             | 6 - 12"             | Silty Sand                        | 0.0        | Sod surface                                 |
|               | -             | 1 - 3'              | Poorly Graded Sand                | 0.3        |   |
|               | -             | 3 - 5'              | Poorly Graded Sand                | 0.2        |   |
|               | -             | 5 - 7'              | Poorly Graded Sand with Gravel    | 0.3        |   |
|               | -             | 7 - 10'             | Poorly Graded Sand with Gravel    | 0.0        |   |
|               | -             | 10 - 12'            | Poorly Graded Coarse Sand         | 0.2        |   |
|               | -             | 12 - 15'            | Poorly Graded Coarse to Fine Sand | 0.0        | Coarse sand w/ perched water 12 - 13'       |
| SB-3          | -             | 8 - 12"             | Silty Sand                        | 0.5        | Asphalt surface (~3" asphalt w/ 5" subbase) |
|               | -             | 1 - 2'              | Poorly Graded Sand                | 0.0        |   |
|               | -             | 2 - 5'              | Poorly Graded Sand                | 0.0        |   |
|               | -             | 5 - 7'              | Poorly Graded Sand with Gravel    | 0.3        |   |
|               | -             | 7 - 10'             | Poorly Graded Sand with Gravel    | 0.8        |   |
|               | -             | 10 - 12'            | Poorly Graded Coarse Sand         | 0.2        |   |
|               | -             | 12 - 15'            | Poorly Graded Coarse to Fine Sand | 0.9        | Coarse sand w/ perched water 12 - 13'       |
| SB-4          | SB-4 (1-2')   | 1 - 2'              | Silty Sand                        | 1.3        | Asphalt surface (~6" asphalt w/ 6" subbase) |
|               | -             | 2 - 5'              | Poorly Graded Sand                | 0.3        |   |
|               | SB-4 (5-6')   | 5 - 6'              | Poorly Graded Sand                | 2.0        | Remnants of brick noted, no odor            |
|               | -             | 6 - 8'              | Poorly Graded Sand with Gravel    | 0.2        |   |
|               | -             | 8 - 10'             | Poorly Graded Sand with Gravel    | 0.9        |   |
|               | -             | 10 - 12'            | Poorly Graded Coarse Sand         | 0.1        |   |
|               | -             | 12 - 15'            | Poorly Graded Coarse to Fine Sand | 0.3        | Coarse sand w/ perched water 12 - 13'       |
| SB-5          | -             | 1 - 2'              | Silty Sand                        | 0.7        | Asphalt surface (~6" asphalt w/ 6" subbase) |
|               | -             | 2 - 3'              | Poorly Graded Sand                | 0.0        |   |
|               | SB-5 (3-5')   | 3 - 5'              | Poorly Graded Sand                | 1.6        |   |
|               | -             | 5 - 7'              | Poorly Graded Sand with Gravel    | 0.0        |   |
|               | -             | 7 - 10'             | Poorly Graded Sand with Gravel    | 0.0        |   |
|               | -             | 10 - 12'            | Poorly Graded Coarse Sand         | 0.0        |   |
|               | -             | 12 - 15'            | Poorly Graded Coarse to Fine Sand | 0.0        | Coarse sand w/ perched water 12 - 13'       |
| SB-6          | -             | 6 - 12"             | Silty Sand                        | 0.1        | Sod surface                                 |
|               | -             | 1 - 2'              | Poorly Graded Sand                | 0.9        |   |
|               | -             | 2 - 5'              | Poorly Graded Sand                | 0.4        |   |
|               | -             | 5 - 7'              | Poorly Graded Sand with Gravel    | 0.2        |   |
|               | -             | 7 - 10'             | Poorly Graded Sand with Gravel    | 0.3        |   |
|               | -             | 10 - 12'            | Poorly Graded Coarse Sand         | 0.2        |   |
|               | -             | 12 - 15'            | Poorly Graded Coarse to Fine Sand | 0.2        | Coarse sand w/ perched water 12 - 13'       |



Summary of Soil Analytical Data  
Proposed BHA Housing Project  
Burlington, Vermont

| Soil Boring ID (depth in feet): | SB-4<br>(1-2') | SB-5<br>(3-5') | SB-4<br>(5-6') | SS-1<br>(6-24") | SS-2<br>(2-5') | SS-3<br>(5-7') | EPA Regional Screening Levels |                  | VTDEC I-Rule<br>Screening Levels<br>(Residential) | VTDEC I-Rule Backgrond<br>Soil Concentrations |       |
|---------------------------------|----------------|----------------|----------------|-----------------|----------------|----------------|-------------------------------|------------------|---|---|-------|
|                                 | 1.3            | 1.6            | 2.0            | -               | -              | -              |                               |                  |   |   |       |
| Sample Date:                    | 6/20/18        | 6/20/18        | 6/20/18        | 6/20/18         | 6/20/18        | 6/20/18        | Residential                   | Industrial       |   | Rural   | Urban |
| VOCs (mg/kg)                    |                |                |                |                 |                |                |                               |                  |   |   |       |
| Dichlorodifluoromethane         | < 0.1          | < 0.1          | < 0.1          |                 |                |                | 87                            | 370              | -   | -   | -     |
| Chloromethane                   | < 0.1          | < 0.1          | < 0.1          |                 |                |                | 110                           | 460              | -   | -   | -     |
| Vinyl chloride                  | < 0.1          | < 0.1          | < 0.1          |                 |                |                | 0.059                         | 1.7              | -   | -   | -     |
| Bromomethane                    | < 0.2          | < 0.2          | < 0.2          |                 |                |                | 6.8                           | 30               | -   | -   | -     |
| Chloroethane                    | < 0.1          | < 0.1          | < 0.1          |                 |                |                | 14,000                        | 57,000           | -   | -   | -     |
| Trichlorofluoromethane          | < 0.1          | < 0.1          | < 0.1          |                 |                |                | 23,000                        | 350,000          | -   | -   | -     |
| Diethyl Ether                   | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 16,000                        | 230,000          | -   | -   | -     |
| Acetone                         | < 2            | < 2            | < 2            |                 |                |                | 61,000                        | 670,000          | 39,900  | -   | -     |
| 1,1-Dichloroethene              | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 230                           | 1,000            | -   | -   | -     |
| Methylene chloride              | < 0.1          | < 0.1          | < 0.1          |                 |                |                | 57                            | 1,000            | -   | -   | -     |
| Carbon disulfide                | < 0.1          | < 0.1          | < 0.1          |                 |                |                | 770                           | 3,500            | -   | -   | -     |
| Methyl-t-butyl ether(MTBE)      | < 0.1          | < 0.1          | < 0.1          |                 |                |                | 47                            | 210              | -   | -   | -     |
| trans-1,2-Dichloroethene        | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 1,600                         | 23,000           | 1,460   | -   | -     |
| 1,1-Dichloroethane              | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 3.6                           | 16               | -   | -   | -     |
| 2,2-Dichloropropane             | < 0.05         | < 0.05         | < 0.05         |                 |                |                | -                             | -                | -   | -   | -     |
| cis-1,2-Dichloroethene          | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 160                           | 2,300            | 146   | -   | -     |
| 2-Butanone(MEK)                 | < 0.5          | < 0.5          | < 0.5          |                 |                |                | 27,000                        | 190,000          | 26,000  | -   | -     |
| Bromochloromethane              | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 150                           | 630              | 129   | -   | -     |
| Tetrahydrofuran(THF)            | < 0.5          | < 0.5          | < 0.5          |                 |                |                | 18,000                        | 94,000           | -   | -   | -     |
| Chloroform                      | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 0.32                          | 1.4              | -   | -   | -     |
| 1,1,1-Trichloroethane           | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 8,100                         | 36,000           | -   | -   | -     |
| Carbon tetrachloride            | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 0.65                          | 2.9              | 0.247   | -   | -     |
| 1,1-Dichloropropene             | < 0.05         | < 0.05         | < 0.05         |                 |                |                | -                             | -                | -   | -   | -     |
| Benzene                         | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 1.2                           | 5.1              | 0.442   | -   | -     |
| 1,2-Dichloroethane              | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 0.46                          | 2.0              | 0.175   | -   | -     |
| Trichloroethene                 | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 0.94                          | 6.0              | 0.442   | -   | -     |
| 1,2-Dichloropropane             | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 2.5                           | 11               | -   | -   | -     |
| Dibromomethane                  | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 24                            | 99               | -   | -   | -     |
| Bromodichloromethane            | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 0.29                          | 1.3              | -   | -   | -     |
| 4-Methyl-2-pentanone(MIBK)      | < 0.5          | < 0.5          | < 0.5          |                 |                |                | 33,000                        | 140,000          | -   | -   | -     |
| cis-1,3-Dichloropropene         | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 1.8                           | 8.2              | -   | -   | -     |
| Toluene                         | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 4,900                         | 47,000           | 4,640   | -   | -     |
| trans-1,3-Dichloropropene       | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 1.8                           | 8.2              | -   | -   | -     |
| 1,1,2-Trichloroethane           | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 1.1                           | 5.0              | -   | -   | -     |
| 2-Hexanone                      | < 0.1          | < 0.1          | < 0.1          |                 |                |                | 200                           | 1,300            | -   | -   | -     |
| Tetrachloroethene               | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 24                            | 100              | 1.46  | -   | -     |
| 1,3-Dichloropropane             | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 1,600                         | 23,000           | -   | -   | -     |
| Dibromochloromethane            | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 8.3                           | 39               | -   | -   | -     |
| 1,2-Dibromoethane(EDB)          | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 0.036                         | 0.16             | -   | -   | -     |
| Chlorobenzene                   | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 280                           | 1,300            | 273   | -   | -     |
| 1,1,1,2-Tetrachloroethane       | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 2.0                           | 8.8              | -   | -   | -     |
| Ethylbenzene                    | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 5.8                           | 25               | 2.21  | -   | -     |
| mp-Xylene                       | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 550                           | 2,400            | 575   | -   | -     |
| o-Xylene                        | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 650                           | 2,800            | -   | -   | -     |
| Styrene                         | 0.052          | < 0.05         | < 0.05         |                 |                |                | 6,000                         | 35,000           | -   | -   | -     |
| Bromoform                       | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 19                            | 86               | -   | -   | -     |
| IsoPropylbenzene                | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 1,900                         | 9,900            | -   | -   | -     |
| Bromobenzene                    | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 290                           | 1,800            | -   | -   | -     |
| 1,1,2,2-Tetrachloroethane       | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 0.6                           | 2.7              | -   | -   | -     |
| 1,2,3-Trichloropropane          | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 0.0051                        | 0.11             | 0.00324   | -   | -     |
| n-Propylbenzene                 | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 3,800                         | 24,000           | -   | -   | -     |
| 2-Chlorotoluene                 | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 1,600                         | 23,000           | -   | -   | -     |
| 4-Chlorotoluene                 | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 1,600                         | 23,000           | -   | -   | -     |
| tert-Butylbenzene               | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 7,800                         | 120,000          | -   | -   | -     |
| 1,3,5-Trimethylbenzene          | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 270                           | 1,500            | 264   | -   | -     |
| 1,2,4-Trimethylbenzene          | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 300                           | 1,800            | -   | -   | -     |
| sec-Butylbenzene                | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 7,800                         | 120,000          | -   | -   | -     |
| 1,3-Dichlorobenzene             | < 0.05         | < 0.05         | < 0.05         |                 |                |                | -                             | -                | -   | -   | -     |
| p-Isopropyltoluene              | < 0.05         | < 0.05         | < 0.05         |                 |                |                | -                             | -                | -   | -   | -     |
| 1,4-Dichlorobenzene             | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 2.6                           | 11               | -   | -   | -     |
| 1,2-Dichlorobenzene             | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 1,800                         | 9,300            | -   | -   | -     |
| n-Butylbenzene                  | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 3,900                         | 58,000           | -   | -   | -     |
| 1,2-Dibromo-3-chloropropane     | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 0.0053                        | 0.064            | 0.00327   | -   | -     |
| 1,2,4-Trichlorobenzene          | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 24                            | 11               | -   | -   | -     |
| Hexachlorobutadiene             | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 1.2                           | 5.3              | -   | -   | -     |
| Naphthalene                     | < 0.1          | < 0.1          | < 0.1          |                 |                |                | 3.8                           | 17               | 1.42  | -   | -     |
| 1,2,3-Trichlorobenzene          | < 0.05         | < 0.05         | < 0.05         |                 |                |                | 63                            | 930              | -   | -   | -     |
| PAHs (mg/kg)                    |                |                |                |                 |                |                |                               |                  |   |   |       |
| Naphthalene                     |                |                |                | 0.032           | < 0.007        | < 0.007        | 3.8                           | 17               | 1.42  | -   | -     |
| 2-Methylnaphthalene             |                |                |                | 0.019           | < 0.007        | < 0.007        | 240                           | 3,000            | -   | -   | -     |
| 1-Methylnaphthalene             |                |                |                | 0.015           | < 0.007        | < 0.007        | 18                            | 73               | -   | -   | -     |
| Acenaphthylene                  |                |                |                | 0.096           | < 0.007        | < 0.007        | -                             | -                | -   | -   | -     |
| Acenaphthene                    |                |                |                | 0.021           | < 0.007        | < 0.007        | 3,600                         | 45,000           | -   | -   | -     |
| Fluorene                        |                |                |                | 0.023           | < 0.007        | < 0.007        | 2,400                         | 30,000           | -   | -   | -     |
| Phenanthrene                    |                |                |                | 0.37            | 0.022          | < 0.007        | -                             | -                | -   | -   | -     |
| Anthracene                      |                |                |                | 0.097           | < 0.007        | < 0.007        | 18,000                        | 230,000          | -   | -   | -     |
| Fluoranthene                    |                |                |                | 1.0             | 0.064          | < 0.007        | 2,400                         | 30,000           | -   | -   | -     |
| Pyrene                          |                |                |                | 0.86            | 0.051          | < 0.007        | 1,800                         | 23,000           | -   | -   | -     |
| Benzo(a)anthracene              |                |                |                | 0.52            | 0.029          | < 0.007        | 1.1                           | 21               | -   | -   | -     |
| Chrysene                        |                |                |                | 0.68            | 0.038          | < 0.007        | 110                           | 2,100            | -   | -   | -     |
| Benzo(b)fluoranthene            |                |                |                | 0.90            | 0.055          | < 0.007        | 1.1                           | 21               | -   | -   | -     |
| Benzo(k)fluoranthene            |                |                |                | 0.30            | 0.020          | < 0.007        | 11                            | 210              | -   | -   | -     |
| Benzo(a)pyrene                  |                |                |                | 0.63            | 0.038          | < 0.007        | 0.11                          | 2.1              | 0.076/1.54 <sup>†</sup>                           | -   | -     |
| Indeno(1,2,3-cd)pyrene          |                |                |                | 0.64            | 0.043          | < 0.007        | 1.1                           | 21               | -   | -   | -     |
| Dibenzo(a,h)anthracene          |                |                |                | 0.15            | 0.0099         | < 0.007        | 0.11                          | 2.1              | -   | -   | -     |
| Benzo(g,h,i)perylene            |                |                |                | 0.58            | 0.045          | < 0.007        | -                             | -                | -   | -   | -     |
| TEQ as Benzo(a)pyrene*          |                |                |                | 0.98968         | 0.060838       | ND             | -                             | -                | -   | 0.026   | 0.58  |
| RCRA METALS (mg/kg)             |                |                |                |                 |                |                |                               |                  |   |   |       |
| Total Arsenic                   |                |                |                | 6.1             | 5.2            | 4.6            | 0.68                          | 3.0              | -   | 16  |       |
| Total Barium                    |                |                |                | 75              | 28             | 20             | 160                           | 2,300            | 36.0  | -   | -     |
| Total Cadmium                   |                |                |                | < 0.5           | < 0.5          | < 0.5          | 71                            | 980              | 7.15  | -   | -     |
| Total Chromium                  |                |                |                | 27              | 17             | 16             | 120,000                       | 1,800,000        | 41,900  | -   | -     |
| Total Lead                      |                |                |                | 75              | 13             | 5.4            | 400                           | 800              | -   | 41  | 111   |
| Total Mercury                   |                |                |                | < 0.1           | < 0.1          | < 0.1          | 11                            | 46               | 10.9  | -   | -     |
| Total Selenium                  |                |                |                | < 0.5           | < 0.5          | < 0.5          | 390                           | 5,800            | 382   | -   | -     |
| Total Silver                    |                |                |                | < 0.5           | < 0.5          | < 0.5          | 390                           | 5,800            | 247   | -   | -     |
| TPH (mg/kg)                     |                |                |                |                 |                |                |                               |                  |   |   |       |
| C9-C40                          |                |                |                | 130             | < 20           | < 20           | 82 to 230,000                 | 420 to 3,500,000 | -   | -   | -     |
| PCBs (mg/kg)                    |                |                |                |                 |                |                |                               |                  |   |   |       |
| PCB-1016                        |                |                |                | < 0.02          | < 0.02         | < 0.02         | 4.1                           | 27               | -   | -   | -     |
| PCB-1221                        |                |                |                | < 0.02          | < 0.02         | < 0.02         | 0.20                          | 0.83             | -   | -   | -     |
| PCB-1232                        |                |                |                | < 0.02          | < 0.02         | < 0.02         | 0.17                          | 0.72             | -   | -   | -     |
| PCB-1242                        |                |                |                | < 0.02          | < 0.02         | < 0.02         | 0.23                          | 0.95             | -   | -   | -     |
| PCB-1248                        |                |                |                | < 0.02          | < 0.02         | < 0.02         | 0.23                          | 0.95             | -   | -   | -     |
| PCB-1254                        |                |                |                | < 0.02          | < 0.02         | < 0.02         | 0.24                          | 0.97             | 0.120   | -   | -     |
| PCB-1260                        |                |                |                | < 0.02          | < 0.02         | < 0.02         | 0.24                          | 0.99             | -   | -   | -     |
| PCB-1262                        |                |                |                | < 0.02          | < 0.02         | < 0.02         | -                             | -                | -   | -   | -     |
| PCB-1268                        |                |                |                | < 0.02          | < 0.02         | < 0.02         | -                             | -                | -   | -   | -     |

NOTES:

All values reported in mg/kg, dry, unless otherwise indicated.

EPA = Environmental Protection Agency; Screening Levels from May 2018 EPA Regional Screening Level Summary Table

VTDEC = Vermont Department of Environmental Conservation

I-Rule = Investigation and Remediation of Contaminated Properties Rule (July 27, 2017)

<xx = Not Detected< Detection Limit; ND = Not Detected

Results reported above detection limits are indicated in bold

Detection limits and reported concentrations at or above the the applicable screening level (e.g., residential/urban) are shaded

"-" indicates not analyzed or that a screening level is not provided in the I-Rule/EPA

<sup>†</sup> Includes residential and industrial benzo(a)pyrene soil screening values

\* Total Equivalent Quotient (TEQ) calculated per method for Polyaromatic Hydrocarbons as defined by Florida Department of Environmental Protection in their "Dose Additivity Guidance", August 3, 2016.



# Eastern Analytical, Inc.

*professional laboratory and drilling services*

Jeremy Roberts  
KAS, Inc.  
PO Box 787  
Williston, VT 05495



Subject: Laboratory Report

Eastern Analytical, Inc. ID: 183379

Client Identification: BHA Riverside Avenue | 505180495

Date Received: 6/21/2018

Dear Mr. Roberts :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at [www.easternanalytical.com](http://www.easternanalytical.com) for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

Solid samples are reported on a dry weight basis, unless otherwise noted

< : "less than" followed by the reporting limit

> : "greater than" followed by the reporting limit

%R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269), Vermont (VT1012) and New York (12072).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample (s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw, Lab Director

7-6-18

Date

22

# of pages (excluding cover letter)

Client: KAS, Inc.

Client Designation: BHA Riverside Avenue | 505180495

Temperature upon receipt (°C): 3.8

Received on ice or cold packs (Yes/No): Y

Acceptable temperature range (°C): 0-6

| Lab ID    | Sample ID  | Date     | Date    | Sample | % Dry  | Exceptions/Comments (other than thermal preservation) |
|-----------|------------|----------|---------|--------|--------|---|
|           |            | Received | Sampled | Matrix | Weight |   |
| 183379.01 | SB-4 1-2'  | 6/21/18  | 6/20/18 | soil   | 91.6   | Adheres to Sample Acceptance Policy                   |
| 183379.02 | SB-5 3-5'  | 6/21/18  | 6/20/18 | soil   | 95.4   | Adheres to Sample Acceptance Policy                   |
| 183379.03 | SB-4 5-6'  | 6/21/18  | 6/20/18 | soil   | 90.0   | Adheres to Sample Acceptance Policy                   |
| 183379.04 | SS-1 6-24" | 6/21/18  | 6/20/18 | soil   | 90.4   | Adheres to Sample Acceptance Policy                   |
| 183379.05 | SS-2 2-5'  | 6/21/18  | 6/20/18 | soil   | 93.3   | Adheres to Sample Acceptance Policy                   |
| 183379.06 | SS-3 5-7'  | 6/21/18  | 6/20/18 | soil   | 94.5   | Adheres to Sample Acceptance Policy                   |
| 183379.07 | Trip Blank | 6/21/18  | 6/20/18 | soil   | 100.0  | Adheres to Sample Acceptance Policy                   |

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.

Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

All results contained in this report relate only to the above listed samples.

References include:

1) EPA 600/4-79-020, 1983

2) Standard Methods for Examination of Water and Wastewater, 20th Edition, 1998 and 22nd Edition, 2012

3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB

4) Hach Water Analysis Handbook, 2nd edition, 1992



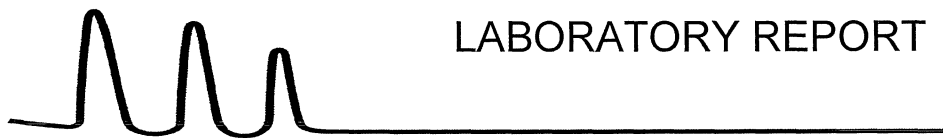
# LABORATORY REPORT

EAI ID#: 183379

Client: KAS, Inc.

Client Designation: BHA Riverside Avenue | 505180495

| Sample ID:                 | SB-4 1-2' | SB-5 3-5' | SB-4 5-6' | Trip Blank |
|----------------------------|-----------|-----------|-----------|------------|
| Lab Sample ID:             | 183379.01 | 183379.02 | 183379.03 | 183379.07  |
| Matrix:                    | soil      | soil      | soil      | soil       |
| Date Sampled:              | 6/20/18   | 6/20/18   | 6/20/18   | 6/20/18    |
| Date Received:             | 6/21/18   | 6/21/18   | 6/21/18   | 6/21/18    |
| Units:                     | mg/kg     | mg/kg     | mg/kg     | mg/kg      |
| Date of Analysis:          | 6/27/18   | 6/27/18   | 6/27/18   | 6/27/18    |
| Analyst:                   | VG        | VG        | VG        | VG         |
| Method:                    | 8260C     | 8260C     | 8260C     | 8260C      |
| Dilution Factor:           | 1         | 1         | 1         | 1          |
| Dichlorodifluoromethane    | < 0.1     | < 0.1     | < 0.1     | < 0.1      |
| Chloromethane              | < 0.1     | < 0.1     | < 0.1     | < 0.1      |
| Vinyl chloride             | < 0.1     | < 0.1     | < 0.1     | < 0.1      |
| Bromomethane               | < 0.2     | < 0.2     | < 0.2     | < 0.2      |
| Chloroethane               | < 0.1     | < 0.1     | < 0.1     | < 0.1      |
| Trichlorofluoromethane     | < 0.1     | < 0.1     | < 0.1     | < 0.1      |
| Diethyl Ether              | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| Acetone                    | < 2       | < 2       | < 2       | < 2        |
| 1,1-Dichloroethene         | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| Methylene chloride         | < 0.1     | < 0.1     | < 0.1     | < 0.1      |
| Carbon disulfide           | < 0.1     | < 0.1     | < 0.1     | < 0.1      |
| Methyl-t-butyl ether(MTBE) | < 0.1     | < 0.1     | < 0.1     | < 0.1      |
| trans-1,2-Dichloroethene   | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 1,1-Dichloroethane         | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 2,2-Dichloropropane        | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| cis-1,2-Dichloroethene     | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 2-Butanone(MEK)            | < 0.5     | < 0.5     | < 0.5     | < 0.5      |
| Bromochloromethane         | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| Tetrahydrofuran(THF)       | < 0.5     | < 0.5     | < 0.5     | < 0.5      |
| Chloroform                 | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 1,1,1-Trichloroethane      | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| Carbon tetrachloride       | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 1,1-Dichloropropene        | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| Benzene                    | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 1,2-Dichloroethane         | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| Trichloroethene            | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 1,2-Dichloropropane        | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| Dibromomethane             | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| Bromodichloromethane       | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 4-Methyl-2-pentanone(MIBK) | < 0.5     | < 0.5     | < 0.5     | < 0.5      |
| cis-1,3-Dichloropropene    | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| Toluene                    | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| trans-1,3-Dichloropropene  | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 1,1,2-Trichloroethane      | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 2-Hexanone                 | < 0.1     | < 0.1     | < 0.1     | < 0.1      |
| Tetrachloroethene          | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 1,3-Dichloropropane        | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| Dibromochloromethane       | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 1,2-Dibromoethane(EDB)     | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| Chlorobenzene              | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 1,1,1,2-Tetrachloroethane  | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| Ethylbenzene               | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| mp-Xylene                  | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| o-Xylene                   | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| Styrene                    | 0.052     | < 0.05    | < 0.05    | < 0.05     |
| Bromoform                  | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| IsoPropylbenzene           | < 0.05    | < 0.05    | < 0.05    | < 0.05     |



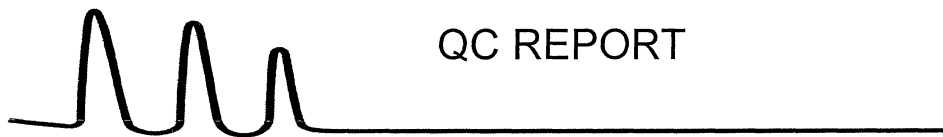
# LABORATORY REPORT

EAI ID#: 183379

Client: KAS, Inc.

Client Designation: BHA Riverside Avenue | 505180495

| Sample ID:                    | SB-4 1-2' | SB-5 3-5' | SB-4 5-6' | Trip Blank |
|-------------------------------|-----------|-----------|-----------|------------|
| Lab Sample ID:                | 183379.01 | 183379.02 | 183379.03 | 183379.07  |
| Matrix:                       | soil      | soil      | soil      | soil       |
| Date Sampled:                 | 6/20/18   | 6/20/18   | 6/20/18   | 6/20/18    |
| Date Received:                | 6/21/18   | 6/21/18   | 6/21/18   | 6/21/18    |
| Units:                        | mg/kg     | mg/kg     | mg/kg     | mg/kg      |
| Date of Analysis:             | 6/27/18   | 6/27/18   | 6/27/18   | 6/27/18    |
| Analyst:                      | VG        | VG        | VG        | VG         |
| Method:                       | 8260C     | 8260C     | 8260C     | 8260C      |
| Dilution Factor:              | 1         | 1         | 1         | 1          |
| Bromobenzene                  | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 1,1,2,2-Tetrachloroethane     | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 1,2,3-Trichloropropane        | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| n-Propylbenzene               | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 2-Chlorotoluene               | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 4-Chlorotoluene               | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 1,3,5-Trimethylbenzene        | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| tert-Butylbenzene             | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 1,2,4-Trimethylbenzene        | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| sec-Butylbenzene              | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 1,3-Dichlorobenzene           | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| p-Isopropyltoluene            | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 1,4-Dichlorobenzene           | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 1,2-Dichlorobenzene           | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| n-Butylbenzene                | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 1,2-Dibromo-3-chloropropane   | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 1,2,4-Trichlorobenzene        | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| Hexachlorobutadiene           | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| Naphthalene                   | < 0.1     | < 0.1     | < 0.1     | < 0.1      |
| 1,2,3-Trichlorobenzene        | < 0.05    | < 0.05    | < 0.05    | < 0.05     |
| 4-Bromofluorobenzene (surr)   | 97 %R     | 95 %R     | 96 %R     | 95 %R      |
| 1,2-Dichlorobenzene-d4 (surr) | 100 %R    | 97 %R     | 104 %R    | 102 %R     |
| 2,5-Dibromotoluene (surr)     | 73 %R     | 78 %R     | 82 %R     | 89 %R      |
| Toluene-d8 (surr)             | 100 %R    | 99 %R     | 99 %R     | 101 %R     |



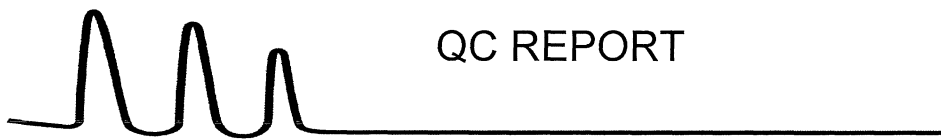
# QC REPORT

EAI ID#: 183379

Client: KAS, Inc.

Client Designation: BHA Riverside Avenue | 505180495

| Parameter Name             | Blank  | LCS          | LCSD                    | Analysis Date | Units | Limits   | RPD | Method |
|----------------------------|--------|--------------|-------------------------|---------------|-------|----------|-----|--------|
| Dichlorodifluoromethane    | < 0.1  |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Chloromethane              | < 0.1  |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Vinyl chloride             | < 0.1  |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Bromomethane               | < 0.2  |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Chloroethane               | < 0.1  |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Trichlorofluoromethane     | < 0.1  |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Diethyl Ether              | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Acetone                    | < 2    |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| 1,1-Dichloroethene         | < 0.05 | 1.1 (105 %R) | 0.84 (84 %R) (22 RPD) ! | 6/25/2018     | mg/kg | 59 - 172 | 20  | 8260C  |
| Methylene chloride         | < 0.1  |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Carbon disulfide           | < 0.1  |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Methyl-t-butyl ether(MTBE) | < 0.1  |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| trans-1,2-Dichloroethene   | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| 1,1-Dichloroethane         | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| 2,2-Dichloropropane        | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| cis-1,2-Dichloroethene     | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| 2-Butanone(MEK)            | < 0.5  |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Bromochloromethane         | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Tetrahydrofuran(THF)       | < 0.5  |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Chloroform                 | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| 1,1,1-Trichloroethane      | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Carbon tetrachloride       | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| 1,1-Dichloropropene        | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Benzene                    | < 0.05 | 1.1 (113 %R) | 0.96 (96 %R) (16 RPD)   | 6/25/2018     | mg/kg | 66 - 142 | 20  | 8260C  |
| 1,2-Dichloroethane         | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Trichloroethene            | < 0.05 | 1.1 (110 %R) | 0.99 (99 %R) (11 RPD)   | 6/25/2018     | mg/kg | 62 - 137 | 20  | 8260C  |
| 1,2-Dichloropropane        | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Dibromomethane             | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Bromodichloromethane       | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| 4-Methyl-2-pentanone(MIBK) | < 0.5  |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| cis-1,3-Dichloropropene    | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Toluene                    | < 0.05 | 1.2 (117 %R) | 1.1 (112 %R) (5 RPD)    | 6/25/2018     | mg/kg | 59 - 139 | 20  | 8260C  |
| trans-1,3-Dichloropropene  | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| 1,1,2-Trichloroethane      | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| 2-Hexanone                 | < 0.1  |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Tetrachloroethene          | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| 1,3-Dichloropropane        | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Dibromochloromethane       | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| 1,2-Dibromoethane(EDB)     | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Chlorobenzene              | < 0.05 | 1.2 (115 %R) | 1.1 (115 %R) (0 RPD)    | 6/25/2018     | mg/kg | 60 - 133 | 20  | 8260C  |
| 1,1,1,2-Tetrachloroethane  | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Ethylbenzene               | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| mp-Xylene                  | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| o-Xylene                   | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Styrene                    | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |
| Bromoform                  | < 0.05 |              |                         | 6/25/2018     | mg/kg |          |     | 8260C  |



# QC REPORT

EAI ID#: 183379

Client: KAS, Inc.

Client Designation: BHA Riverside Avenue | 505180495

| Parameter Name                | Blank  | LCS    | LCSD   | Analysis Date | Units | Limits   | RPD | Method |
|-------------------------------|--------|--------|--------|---------------|-------|----------|-----|--------|
| IsoPropylbenzene              | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| Bromobenzene                  | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| 1,1,2,2-Tetrachloroethane     | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| 1,2,3-Trichloropropane        | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| n-Propylbenzene               | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| 2-Chlorotoluene               | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| 4-Chlorotoluene               | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| 1,3,5-Trimethylbenzene        | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| tert-Butylbenzene             | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| 1,2,4-Trimethylbenzene        | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| sec-Butylbenzene              | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| 1,3-Dichlorobenzene           | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| p-Isopropyltoluene            | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| 1,4-Dichlorobenzene           | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| 1,2-Dichlorobenzene           | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| n-Butylbenzene                | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| 1,2-Dibromo-3-chloropropane   | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| 1,2,4-Trichlorobenzene        | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| Hexachlorobutadiene           | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| Naphthalene                   | < 0.1  |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| 1,2,3-Trichlorobenzene        | < 0.05 |        |        | 6/25/2018     | mg/kg |          |     | 8260C  |
| 4-Bromofluorobenzene (surr)   | 94 %R  | 93 %R  | 95 %R  | 6/25/2018     | % Rec | 70 - 130 | 20  | 8260C  |
| 1,2-Dichlorobenzene-d4 (surr) | 100 %R | 99 %R  | 98 %R  | 6/25/2018     | % Rec | 70 - 130 | 20  | 8260C  |
| 2,5-Dibromotoluene (surr)     | 85 %R  | 88 %R  | 89 %R  | 6/25/2018     | % Rec | 40 - 160 | 20  | 8260C  |
| Toluene-d8 (surr)             | 102 %R | 100 %R | 101 %R | 6/25/2018     | % Rec | 70 - 130 | 20  | 8260C  |

Samples were extracted and analyzed within holding time limits.

Instrumentation was calibrated in accordance with the method requirements.

The method blanks were free of contamination at the reporting limits.

Sample surrogate recoveries met the above stated criteria.

The associated matrix spikes and/or Laboratory Control Samples met acceptance criteria.

There were no exceptions in the analyses, unless noted.

\*! Flagged analyte recoveries deviated from the QA/QC limits. Unless noted below, flagged analytes that exceed acceptance limits in the Quality Control sample were not detected in the field samples.

Analytes that exceed limits high but are not detected in the field samples do not impact the data. For analytes that show low recovery and are not detected in the field samples, a low point calibration standard has been analyzed to support the reporting limit.



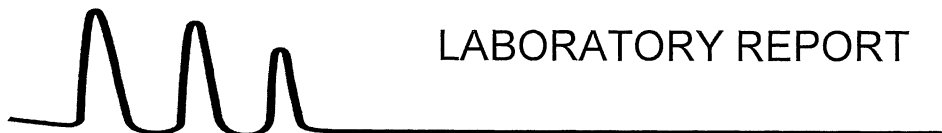
## LABORATORY REPORT

EAI ID#: 183379

Client: KAS, Inc.

Client Designation: BHA Riverside Avenue | 505180495

|                             |            |                 |               |         |     |
|-----------------------------|------------|-----------------|---------------|---------|-----|
| Client Sample ID:           | SS-1 6-24" | Date Prepared:  |               | 6/25/18 |     |
| Lab Sample ID:              | 183379.04  | Units:          |               | mg/kg   |     |
| Matrix:                     | soil       | Method:         |               | 8270D   |     |
| Date Sampled:               | 6/20/18    | Analyst:        |               | JMR     |     |
| Date Received:              | 6/21/18    | Dilution Factor | Date Analyzed | TEF     | TEQ |
| alpha-Terpineol             | < 0.4      | 1               | 6/26/18       |         |     |
| Phenol                      | < 0.08     | 1               | 6/26/18       |         |     |
| 2-Chlorophenol              | < 0.08     | 1               | 6/26/18       |         |     |
| 2,4-Dichlorophenol          | < 0.08     | 1               | 6/26/18       |         |     |
| 2,4,5-Trichlorophenol       | < 0.08     | 1               | 6/26/18       |         |     |
| 2,4,6-Trichlorophenol       | < 0.08     | 1               | 6/26/18       |         |     |
| Pentachlorophenol           | < 0.4      | 1               | 6/26/18       |         |     |
| 2-Nitrophenol               | < 0.4      | 1               | 6/26/18       |         |     |
| 4-Nitrophenol               | < 0.4      | 1               | 6/26/18       |         |     |
| 2,4-Dinitrophenol           | < 0.7      | 1               | 6/26/18       |         |     |
| 2-Methylphenol              | < 0.08     | 1               | 6/26/18       |         |     |
| 3/4-Methylphenol            | < 0.08     | 1               | 6/26/18       |         |     |
| 2,4-Dimethylphenol          | < 0.4      | 1               | 6/26/18       |         |     |
| 4-Chloro-3-methylphenol     | < 0.08     | 1               | 6/26/18       |         |     |
| 4,6-Dinitro-2-methylphenol  | < 0.4      | 1               | 6/26/18       |         |     |
| Benzoic Acid                | < 4        | 1               | 6/26/18       |         |     |
| N-Nitrosodimethylamine      | < 0.08     | 1               | 6/26/18       |         |     |
| n-Nitroso-di-n-propylamine  | < 0.08     | 1               | 6/26/18       |         |     |
| n-Nitrosodiphenylamine      | < 0.08     | 1               | 6/26/18       |         |     |
| bis(2-Chloroethyl)ether     | < 0.08     | 1               | 6/26/18       |         |     |
| bis(2-chloroisopropyl)ether | < 0.08     | 1               | 6/26/18       |         |     |
| bis(2-Chloroethoxy)methane  | < 0.08     | 1               | 6/26/18       |         |     |
| 1,3-Dichlorobenzene         | < 0.08     | 1               | 6/26/18       |         |     |
| Acetophenone                | < 0.7      | 1               | 6/26/18       |         |     |
| 1,4-Dichlorobenzene         | < 0.08     | 1               | 6/26/18       |         |     |
| 1,2-Dichlorobenzene         | < 0.08     | 1               | 6/26/18       |         |     |
| 1,2,4-Trichlorobenzene      | < 0.08     | 1               | 6/26/18       |         |     |
| 2-Chloronaphthalene         | < 0.08     | 1               | 6/26/18       |         |     |
| 4-Chlorophenyl-phenylether  | < 0.08     | 1               | 6/26/18       |         |     |
| 4-Bromophenyl-phenylether   | < 0.08     | 1               | 6/26/18       |         |     |
| Hexachloroethane            | < 0.08     | 1               | 6/26/18       |         |     |
| Hexachlorobutadiene         | < 0.08     | 1               | 6/26/18       |         |     |
| Hexachlorocyclopentadiene   | < 0.4      | 1               | 6/26/18       |         |     |
| Hexachlorobenzene           | < 0.08     | 1               | 6/26/18       |         |     |
| 4-Chloroaniline             | < 0.08     | 1               | 6/26/18       |         |     |
| 2,3-Dichloroaniline         | < 0.08     | 1               | 6/26/18       |         |     |
| 2-Nitroaniline              | < 0.4      | 1               | 6/26/18       |         |     |
| 3-Nitroaniline              | < 0.4      | 1               | 6/26/18       |         |     |
| 4-Nitroaniline              | < 0.4      | 1               | 6/26/18       |         |     |
| Aniline                     | < 0.08     | 1               | 6/26/18       |         |     |
| Benzyl alcohol              | < 0.7      | 1               | 6/26/18       |         |     |
| Nitrobenzene                | < 0.08     | 1               | 6/26/18       |         |     |
| Isophorone                  | < 0.08     | 1               | 6/26/18       |         |     |
| 2,4-Dinitrotoluene          | < 0.4      | 1               | 6/26/18       |         |     |
| 2,6-Dinitrotoluene          | < 0.4      | 1               | 6/26/18       |         |     |
| Benzidine (estimated)       | < 0.4      | 1               | 6/26/18       |         |     |



## LABORATORY REPORT

EAI ID#: 183379

Client: KAS, Inc.

Client Designation: BHA Riverside Avenue | 505180495

|                             |            |                    |               |         |        |
|-----------------------------|------------|--------------------|---------------|---------|--------|
| Client Sample ID:           | SS-1 6-24" | Date Prepared:     |               | 6/25/18 |        |
| Lab Sample ID:              | 183379.04  | Units:             |               | mg/kg   |        |
| Matrix:                     | soil       | Method:            |               | 8270D   |        |
| Date Sampled:               | 6/20/18    | Dilution<br>Factor | Analyst:      |         | JMR    |
| Date Received:              | 6/21/18    |                    | Date Analyzed | TEF     | TEQ    |
| 3,3'-Dichlorobenzidine      | < 0.08     | 1                  | 6/26/18       |         |        |
| Pyridine                    | < 0.4      | 1                  | 6/26/18       |         |        |
| Azobenzene                  | < 0.08     | 1                  | 6/26/18       |         |        |
| Carbazole                   | < 0.08     | 1                  | 6/26/18       |         |        |
| Dimethylphthalate           | < 0.08     | 1                  | 6/26/18       |         |        |
| Diethylphthalate            | < 0.4      | 1                  | 6/26/18       |         |        |
| Di-n-butylphthalate         | < 0.4      | 1                  | 6/26/18       |         |        |
| Butylbenzylphthalate        | < 0.4      | 1                  | 6/26/18       |         |        |
| bis(2-Ethylhexyl)phthalate  | < 0.4      | 1                  | 6/26/18       |         |        |
| Di-n-octylphthalate         | < 0.4      | 1                  | 6/26/18       |         |        |
| Dibenzofuran                | < 0.08     | 1                  | 6/26/18       |         |        |
| Naphthalene                 | 0.032      | 1                  | 6/26/18       |         |        |
| 2-Methylnaphthalene         | 0.019      | 1                  | 6/26/18       |         |        |
| 1-Methylnaphthalene         | 0.015      | 1                  | 6/26/18       |         |        |
| Acenaphthylene              | 0.096      | 1                  | 6/26/18       |         |        |
| Acenaphthene                | 0.021      | 1                  | 6/26/18       |         |        |
| Fluorene                    | 0.023      | 1                  | 6/26/18       |         |        |
| Phenanthrene                | 0.37       | 1                  | 6/26/18       |         |        |
| Anthracene                  | 0.097      | 1                  | 6/26/18       |         |        |
| Fluoranthene                | 1.0        | 1                  | 6/26/18       |         |        |
| Pyrene                      | 0.86       | 1                  | 6/26/18       |         |        |
| Benzo[a]anthracene          | 0.52       | 1                  | 6/26/18       | 0.1     | .052   |
| Chrysene                    | 0.68       | 1                  | 6/26/18       | 0.001   | .00068 |
| Benzo[b]fluoranthene        | 0.90       | 1                  | 6/26/18       | 0.1     | .09    |
| Benzo[k]fluoranthene        | 0.30       | 1                  | 6/26/18       | 0.01    | .003   |
| Benzo[a]pyrene              | 0.63       | 1                  | 6/26/18       | 1       | .63    |
| Indeno[1,2,3-cd]pyrene      | 0.64       | 1                  | 6/26/18       | 0.1     | .064   |
| Dibenz[a,h]anthracene       | 0.15       | 1                  | 6/26/18       | 1       | .15    |
| Benzo[g,h,i]perylene        | 0.58       | 1                  | 6/26/18       |         |        |
| n-Decane                    | < 0.4      | 1                  | 6/26/18       |         |        |
| n-Octadecane                | < 0.4      | 1                  | 6/26/18       |         |        |
| 2-Fluorophenol (surr)       | 59 %R      |                    | 6/26/18       |         |        |
| Phenol-d6 (surr)            | 63 %R      |                    | 6/26/18       |         |        |
| 2,4,6-Tribromophenol (surr) | 93 %R      |                    | 6/26/18       |         |        |
| Nitrobenzene-D5 (surr)      | 67 %R      |                    | 6/26/18       |         |        |
| 2-Fluorobiphenyl (surr)     | 76 %R      |                    | 6/26/18       |         |        |
| p-Terphenyl-D14 (surr)      | 82 %R      |                    | 6/26/18       |         |        |

TEF: Toxicity Equivalent Factor TEQ: Toxicity Equivalence to Benzo[a]pyrene

The TEF factors set forth in this report are taken from the following EPA document: "Mid- Atlantic Risk Assessment User's Guide: November 2013". This guidance document sets forth a recommended, but not mandatory approach based upon currently available information with respect to risk assessment for response actions at CERCLA sites. This document does not establish binding rules. This document contains the most current TEF values per VT IROCP.



# LABORATORY REPORT

EAI ID#: 183379

Client: KAS, Inc.

Client Designation: BHA Riverside Avenue | 505180495

|                             |           |                 |         |
|-----------------------------|-----------|-----------------|---------|
| Client Sample ID:           | SS-2 2-5' | Date Prepared:  | 6/25/18 |
| Lab Sample ID:              | 183379.05 | Units:          | mg/kg   |
| Matrix:                     | soil      | Method:         | 8270D   |
| Date Sampled:               | 6/20/18   | Analyst:        | JMR     |
| Date Received:              | 6/21/18   | Dilution Factor |         |
|                             |           | Date Analyzed   | TEF TEQ |
| alpha-Terpineol             | < 0.4     | 1               | 6/26/18 |
| Phenol                      | < 0.07    | 1               | 6/26/18 |
| 2-Chlorophenol              | < 0.07    | 1               | 6/26/18 |
| 2,4-Dichlorophenol          | < 0.07    | 1               | 6/26/18 |
| 2,4,5-Trichlorophenol       | < 0.07    | 1               | 6/26/18 |
| 2,4,6-Trichlorophenol       | < 0.07    | 1               | 6/26/18 |
| Pentachlorophenol           | < 0.4     | 1               | 6/26/18 |
| 2-Nitrophenol               | < 0.4     | 1               | 6/26/18 |
| 4-Nitrophenol               | < 0.4     | 1               | 6/26/18 |
| 2,4-Dinitrophenol           | < 0.7     | 1               | 6/26/18 |
| 2-Methylphenol              | < 0.07    | 1               | 6/26/18 |
| 3/4-Methylphenol            | < 0.07    | 1               | 6/26/18 |
| 2,4-Dimethylphenol          | < 0.4     | 1               | 6/26/18 |
| 4-Chloro-3-methylphenol     | < 0.07    | 1               | 6/26/18 |
| 4,6-Dinitro-2-methylphenol  | < 0.4     | 1               | 6/26/18 |
| Benzoic Acid                | < 4       | 1               | 6/26/18 |
| N-Nitrosodimethylamine      | < 0.07    | 1               | 6/26/18 |
| n-Nitroso-di-n-propylamine  | < 0.07    | 1               | 6/26/18 |
| n-Nitrosodiphenylamine      | < 0.07    | 1               | 6/26/18 |
| bis(2-Chloroethyl)ether     | < 0.07    | 1               | 6/26/18 |
| bis(2-chloroisopropyl)ether | < 0.07    | 1               | 6/26/18 |
| bis(2-Chloroethoxy)methane  | < 0.07    | 1               | 6/26/18 |
| 1,3-Dichlorobenzene         | < 0.07    | 1               | 6/26/18 |
| Acetophenone                | < 0.7     | 1               | 6/26/18 |
| 1,4-Dichlorobenzene         | < 0.07    | 1               | 6/26/18 |
| 1,2-Dichlorobenzene         | < 0.07    | 1               | 6/26/18 |
| 1,2,4-Trichlorobenzene      | < 0.07    | 1               | 6/26/18 |
| 2-Chloronaphthalene         | < 0.07    | 1               | 6/26/18 |
| 4-Chlorophenyl-phenylether  | < 0.07    | 1               | 6/26/18 |
| 4-Bromophenyl-phenylether   | < 0.07    | 1               | 6/26/18 |
| Hexachloroethane            | < 0.07    | 1               | 6/26/18 |
| Hexachlorobutadiene         | < 0.07    | 1               | 6/26/18 |
| Hexachlorocyclopentadiene   | < 0.4     | 1               | 6/26/18 |
| Hexachlorobenzene           | < 0.07    | 1               | 6/26/18 |
| 4-Chloroaniline             | < 0.07    | 1               | 6/26/18 |
| 2,3-Dichloroaniline         | < 0.07    | 1               | 6/26/18 |
| 2-Nitroaniline              | < 0.4     | 1               | 6/26/18 |
| 3-Nitroaniline              | < 0.4     | 1               | 6/26/18 |
| 4-Nitroaniline              | < 0.4     | 1               | 6/26/18 |
| Aniline                     | < 0.07    | 1               | 6/26/18 |
| Benzyl alcohol              | < 0.7     | 1               | 6/26/18 |
| Nitrobenzene                | < 0.07    | 1               | 6/26/18 |
| Isophorone                  | < 0.07    | 1               | 6/26/18 |
| 2,4-Dinitrotoluene          | < 0.4     | 1               | 6/26/18 |
| 2,6-Dinitrotoluene          | < 0.4     | 1               | 6/26/18 |
| Benzidine (estimated)       | < 0.4     | 1               | 6/26/18 |



# LABORATORY REPORT

EAI ID#: 183379

Client: KAS, Inc.

Client Designation: BHA Riverside Avenue | 505180495

|                             |           |                 |         |               |         |
|-----------------------------|-----------|-----------------|---------|---------------|---------|
| Client Sample ID:           | SS-2 2-5' | Date Prepared:  | 6/25/18 |               |         |
| Lab Sample ID:              | 183379.05 | Units:          | mg/kg   |               |         |
| Matrix:                     | soil      | Method:         | 8270D   |               |         |
| Date Sampled:               | 6/20/18   | Analyst:        | JMR     |               |         |
| Date Received:              | 6/21/18   | Dilution Factor |         | Date Analyzed | TEF TEQ |
| 3,3'-Dichlorobenzidine      | < 0.07    | 1               | 6/26/18 |               |         |
| Pyridine                    | < 0.4     | 1               | 6/26/18 |               |         |
| Azobenzene                  | < 0.07    | 1               | 6/26/18 |               |         |
| Carbazole                   | < 0.07    | 1               | 6/26/18 |               |         |
| Dimethylphthalate           | < 0.07    | 1               | 6/26/18 |               |         |
| Diethylphthalate            | < 0.4     | 1               | 6/26/18 |               |         |
| Di-n-butylphthalate         | < 0.4     | 1               | 6/26/18 |               |         |
| Butylbenzylphthalate        | < 0.4     | 1               | 6/26/18 |               |         |
| bis(2-Ethylhexyl)phthalate  | < 0.4     | 1               | 6/26/18 |               |         |
| Di-n-octylphthalate         | < 0.4     | 1               | 6/26/18 |               |         |
| Dibenzofuran                | < 0.07    | 1               | 6/26/18 |               |         |
| Naphthalene                 | < 0.007   | 1               | 6/26/18 |               |         |
| 2-Methylnaphthalene         | < 0.007   | 1               | 6/26/18 |               |         |
| 1-Methylnaphthalene         | < 0.007   | 1               | 6/26/18 |               |         |
| Acenaphthylene              | < 0.007   | 1               | 6/26/18 |               |         |
| Acenaphthene                | < 0.007   | 1               | 6/26/18 |               |         |
| Fluorene                    | < 0.007   | 1               | 6/26/18 |               |         |
| Phenanthrene                | 0.022     | 1               | 6/26/18 |               |         |
| Anthracene                  | < 0.007   | 1               | 6/26/18 |               |         |
| Fluoranthene                | 0.064     | 1               | 6/26/18 |               |         |
| Pyrene                      | 0.051     | 1               | 6/26/18 |               |         |
| Benzo[a]anthracene          | 0.029     | 1               | 6/26/18 | 0.1           | .0029   |
| Chrysene                    | 0.038     | 1               | 6/26/18 | 0.001         | .000038 |
| Benzo[b]fluoranthene        | 0.055     | 1               | 6/26/18 | 0.1           | .0055   |
| Benzo[k]fluoranthene        | 0.020     | 1               | 6/26/18 | 0.01          | .0002   |
| Benzo[a]pyrene              | 0.038     | 1               | 6/26/18 | 1             | .038    |
| Indeno[1,2,3-cd]pyrene      | 0.043     | 1               | 6/26/18 | 0.1           | .0043   |
| Dibenz[a,h]anthracene       | 0.0099    | 1               | 6/26/18 | 1             | .0099   |
| Benzo[g,h,i]perylene        | 0.045     | 1               | 6/26/18 |               |         |
| n-Decane                    | < 0.4     | 1               | 6/26/18 |               |         |
| n-Octadecane                | < 0.4     | 1               | 6/26/18 |               |         |
| 2-Fluorophenol (surr)       | 57 %R     |                 | 6/26/18 |               |         |
| Phenol-d6 (surr)            | 60 %R     |                 | 6/26/18 |               |         |
| 2,4,6-Tribromophenol (surr) | 90 %R     |                 | 6/26/18 |               |         |
| Nitrobenzene-D5 (surr)      | 63 %R     |                 | 6/26/18 |               |         |
| 2-Fluorobiphenyl (surr)     | 71 %R     |                 | 6/26/18 |               |         |
| p-Terphenyl-D14 (surr)      | 78 %R     |                 | 6/26/18 |               |         |

TEF: Toxicity Equivalent Factor TEQ: Toxicity Equivalence to Benzo[a]pyrene

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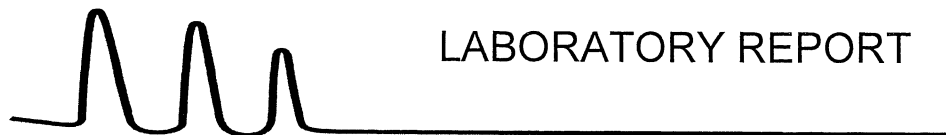
## LABORATORY REPORT

EAI ID#: 183379

Client: KAS, Inc.

Client Designation: BHA Riverside Avenue | 505180495

|                             |           |                    |               |         |     |
|-----------------------------|-----------|--------------------|---------------|---------|-----|
| Client Sample ID:           | SS-3 5-7' | Date Prepared:     |               | 6/25/18 |     |
| Lab Sample ID:              | 183379.06 | Units:             |               | mg/kg   |     |
| Matrix:                     | soil      | Method:            |               | 8270D   |     |
| Date Sampled:               | 6/20/18   | Dilution<br>Factor | Analyst:      |         | JMR |
| Date Received:              | 6/21/18   |                    | Date Analyzed | TEF     | TEQ |
| alpha-Terpineol             | < 0.4     | 1                  | 6/26/18       |         |     |
| Phenol                      | < 0.07    | 1                  | 6/26/18       |         |     |
| 2-Chlorophenol              | < 0.07    | 1                  | 6/26/18       |         |     |
| 2,4-Dichlorophenol          | < 0.07    | 1                  | 6/26/18       |         |     |
| 2,4,5-Trichlorophenol       | < 0.07    | 1                  | 6/26/18       |         |     |
| 2,4,6-Trichlorophenol       | < 0.07    | 1                  | 6/26/18       |         |     |
| Pentachlorophenol           | < 0.4     | 1                  | 6/26/18       |         |     |
| 2-Nitrophenol               | < 0.4     | 1                  | 6/26/18       |         |     |
| 4-Nitrophenol               | < 0.4     | 1                  | 6/26/18       |         |     |
| 2,4-Dinitrophenol           | < 0.7     | 1                  | 6/26/18       |         |     |
| 2-Methylphenol              | < 0.07    | 1                  | 6/26/18       |         |     |
| 3/4-Methylphenol            | < 0.07    | 1                  | 6/26/18       |         |     |
| 2,4-Dimethylphenol          | < 0.4     | 1                  | 6/26/18       |         |     |
| 4-Chloro-3-methylphenol     | < 0.07    | 1                  | 6/26/18       |         |     |
| 4,6-Dinitro-2-methylphenol  | < 0.4     | 1                  | 6/26/18       |         |     |
| Benzoic Acid                | < 4       | 1                  | 6/26/18       |         |     |
| N-Nitrosodimethylamine      | < 0.07    | 1                  | 6/26/18       |         |     |
| n-Nitroso-di-n-propylamine  | < 0.07    | 1                  | 6/26/18       |         |     |
| n-Nitrosodiphenylamine      | < 0.07    | 1                  | 6/26/18       |         |     |
| bis(2-Chloroethyl)ether     | < 0.07    | 1                  | 6/26/18       |         |     |
| bis(2-chloroisopropyl)ether | < 0.07    | 1                  | 6/26/18       |         |     |
| bis(2-Chloroethoxy)methane  | < 0.07    | 1                  | 6/26/18       |         |     |
| 1,3-Dichlorobenzene         | < 0.07    | 1                  | 6/26/18       |         |     |
| Acetophenone                | < 0.7     | 1                  | 6/26/18       |         |     |
| 1,4-Dichlorobenzene         | < 0.07    | 1                  | 6/26/18       |         |     |
| 1,2-Dichlorobenzene         | < 0.07    | 1                  | 6/26/18       |         |     |
| 1,2,4-Trichlorobenzene      | < 0.07    | 1                  | 6/26/18       |         |     |
| 2-Chloronaphthalene         | < 0.07    | 1                  | 6/26/18       |         |     |
| 4-Chlorophenyl-phenylether  | < 0.07    | 1                  | 6/26/18       |         |     |
| 4-Bromophenyl-phenylether   | < 0.07    | 1                  | 6/26/18       |         |     |
| Hexachloroethane            | < 0.07    | 1                  | 6/26/18       |         |     |
| Hexachlorobutadiene         | < 0.07    | 1                  | 6/26/18       |         |     |
| Hexachlorocyclopentadiene   | < 0.4     | 1                  | 6/26/18       |         |     |
| Hexachlorobenzene           | < 0.07    | 1                  | 6/26/18       |         |     |
| 4-Chloroaniline             | < 0.07    | 1                  | 6/26/18       |         |     |
| 2,3-Dichloroaniline         | < 0.07    | 1                  | 6/26/18       |         |     |
| 2-Nitroaniline              | < 0.4     | 1                  | 6/26/18       |         |     |
| 3-Nitroaniline              | < 0.4     | 1                  | 6/26/18       |         |     |
| 4-Nitroaniline              | < 0.4     | 1                  | 6/26/18       |         |     |
| Aniline                     | < 0.07    | 1                  | 6/26/18       |         |     |
| Benzyl alcohol              | < 0.7     | 1                  | 6/26/18       |         |     |
| Nitrobenzene                | < 0.07    | 1                  | 6/26/18       |         |     |
| Isophorone                  | < 0.07    | 1                  | 6/26/18       |         |     |
| 2,4-Dinitrotoluene          | < 0.4     | 1                  | 6/26/18       |         |     |
| 2,6-Dinitrotoluene          | < 0.4     | 1                  | 6/26/18       |         |     |
| Benzidine (estimated)       | < 0.4     | 1                  | 6/26/18       |         |     |



# LABORATORY REPORT

EAI ID#: 183379

Client: KAS, Inc.

Client Designation: BHA Riverside Avenue | 505180495

|                             |           |                 |         |               |          |
|-----------------------------|-----------|-----------------|---------|---------------|----------|
| Client Sample ID:           | SS-3 5-7' | Date Prepared:  | 6/25/18 |               |          |
| Lab Sample ID:              | 183379.06 | Units:          | mg/kg   |               |          |
| Matrix:                     | soil      | Method:         | 8270D   |               |          |
| Date Sampled:               | 6/20/18   | Analyst:        | JMR     |               |          |
| Date Received:              | 6/21/18   | Dilution Factor |         | Date Analyzed | TEF TEQ  |
| 3,3'-Dichlorobenzidine      | < 0.07    | 1               | 6/26/18 |               |          |
| Pyridine                    | < 0.4     | 1               | 6/26/18 |               |          |
| Azobenzene                  | < 0.07    | 1               | 6/26/18 |               |          |
| Carbazole                   | < 0.07    | 1               | 6/26/18 |               |          |
| Dimethylphthalate           | < 0.07    | 1               | 6/26/18 |               |          |
| Diethylphthalate            | < 0.4     | 1               | 6/26/18 |               |          |
| Di-n-butylphthalate         | < 0.4     | 1               | 6/26/18 |               |          |
| Butylbenzylphthalate        | < 0.4     | 1               | 6/26/18 |               |          |
| bis(2-Ethylhexyl)phthalate  | < 0.4     | 1               | 6/26/18 |               |          |
| Di-n-octylphthalate         | < 0.4     | 1               | 6/26/18 |               |          |
| Dibenzofuran                | < 0.07    | 1               | 6/26/18 |               |          |
| Naphthalene                 | < 0.007   | 1               | 6/26/18 |               |          |
| 2-Methylnaphthalene         | < 0.007   | 1               | 6/26/18 |               |          |
| 1-Methylnaphthalene         | < 0.007   | 1               | 6/26/18 |               |          |
| Acenaphthylene              | < 0.007   | 1               | 6/26/18 |               |          |
| Acenaphthene                | < 0.007   | 1               | 6/26/18 |               |          |
| Fluorene                    | < 0.007   | 1               | 6/26/18 |               |          |
| Phenanthrene                | < 0.007   | 1               | 6/26/18 |               |          |
| Anthracene                  | < 0.007   | 1               | 6/26/18 |               |          |
| Fluoranthene                | < 0.007   | 1               | 6/26/18 |               |          |
| Pyrene                      | < 0.007   | 1               | 6/26/18 |               |          |
| Benzo[a]anthracene          | < 0.007   | 1               | 6/26/18 | 0.1           | < .0007  |
| Chrysene                    | < 0.007   | 1               | 6/26/18 | 0.001         | < .00000 |
| Benzo[b]fluoranthene        | < 0.007   | 1               | 6/26/18 | 0.1           | < .0007  |
| Benzo[k]fluoranthene        | < 0.007   | 1               | 6/26/18 | 0.01          | < .00007 |
| Benzo[a]pyrene              | < 0.007   | 1               | 6/26/18 | 1             | < .007   |
| Indeno[1,2,3-cd]pyrene      | < 0.007   | 1               | 6/26/18 | 0.1           | < .0007  |
| Dibenz[a,h]anthracene       | < 0.007   | 1               | 6/26/18 | 1             | < .007   |
| Benzo[g,h,i]perylene        | < 0.007   | 1               | 6/26/18 |               |          |
| n-Decane                    | < 0.4     | 1               | 6/26/18 |               |          |
| n-Octadecane                | < 0.4     | 1               | 6/26/18 |               |          |
| 2-Fluorophenol (surr)       | 65 %R     |                 | 6/26/18 |               |          |
| Phenol-d6 (surr)            | 66 %R     |                 | 6/26/18 |               |          |
| 2,4,6-Tribromophenol (surr) | 95 %R     |                 | 6/26/18 |               |          |
| Nitrobenzene-D5 (surr)      | 71 %R     |                 | 6/26/18 |               |          |
| 2-Fluorobiphenyl (surr)     | 78 %R     |                 | 6/26/18 |               |          |
| p-Terphenyl-D14 (surr)      | 83 %R     |                 | 6/26/18 |               |          |

TEF: Toxicity Equivalent Factor TEQ: Toxicity Equivalence to Benzo[a]pyrene

The TEF factors set forth in this report are taken from the following EPA document: "Mid- Atlantic Risk Assessment User's Guide: November 2013". This guidance document sets forth a recommended, but not mandatory approach based upon currently available information with respect to risk assessment for response actions at CERCLA sites. This document does not establish binding rules. This document contains the most current TEF values per VT IROCP.



# QC REPORT

EAI ID#: 183379

Client: KAS, Inc.

Batch ID: 636655-12911/S062518ABN1

Client Designation: BHA Riverside Avenue | 505180495

| Parameter Name              | Blank  | LCS              | LCSD                    | Analysis Date | Units | Limits   | RPD | Method |
|-----------------------------|--------|------------------|-------------------------|---------------|-------|----------|-----|--------|
| alpha-Terpineol             | < 0.34 | 1.1 (67 %R)      | 1.2 (73 %R) (8 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Phenol                      | < 0.07 | 1.9 (57 %R)      | 2.1 (62 %R) (7 RPD)     | 6/26/2018     | mg/kg | 15 - 130 | 30  | 8270D  |
| 2-Chlorophenol              | < 0.07 | 2.1 (62 %R)      | 2.3 (68 %R) (9 RPD)     | 6/26/2018     | mg/kg | 30 - 130 | 30  | 8270D  |
| 2,4-Dichlorophenol          | < 0.07 | 2.4 (71 %R)      | 2.6 (77 %R) (9 RPD)     | 6/26/2018     | mg/kg | 30 - 130 | 30  | 8270D  |
| 2,4,5-Trichlorophenol       | < 0.07 | 2.6 (77 %R)      | 2.7 (80 %R) (3 RPD)     | 6/26/2018     | mg/kg | 30 - 130 | 30  | 8270D  |
| 2,4,6-Trichlorophenol       | < 0.07 | 2.6 (79 %R)      | 2.7 (82 %R) (4 RPD)     | 6/26/2018     | mg/kg | 30 - 130 | 30  | 8270D  |
| Pentachlorophenol           | < 0.34 | 2.7 (80 %R)      | 2.7 (80 %R) (1 RPD)     | 6/26/2018     | mg/kg | 30 - 130 | 30  | 8270D  |
| 2-Nitrophenol               | < 0.34 | 2.3 (70 %R)      | 2.6 (78 %R) (10 RPD)    | 6/26/2018     | mg/kg | 30 - 130 | 30  | 8270D  |
| 4-Nitrophenol               | < 0.34 | 2.6 (78 %R)      | 2.7 (82 %R) (4 RPD)     | 6/26/2018     | mg/kg | 15 - 130 | 30  | 8270D  |
| 2,4-Dinitrophenol           | < 0.7  | 2.7 (81 %R)      | 2.8 (83 %R) (2 RPD)     | 6/26/2018     | mg/kg | 15 - 130 | 30  | 8270D  |
| 2-Methylphenol              | < 0.07 | 2.1 (63 %R)      | 2.2 (67 %R) (7 RPD)     | 6/26/2018     | mg/kg | 30 - 130 | 30  | 8270D  |
| 3/4-Methylphenol            | < 0.07 | 2.3 (69 %R)      | 2.5 (74 %R) (7 RPD)     | 6/26/2018     | mg/kg | 30 - 130 | 30  | 8270D  |
| 2,4-Dimethylphenol          | < 0.34 | 2.0 (59 %R)      | 2.2 (66 %R) (11 RPD)    | 6/26/2018     | mg/kg | 30 - 130 | 30  | 8270D  |
| 4-Chloro-3-methylphenol     | < 0.07 | 2.5 (76 %R)      | 2.6 (79 %R) (4 RPD)     | 6/26/2018     | mg/kg | 30 - 130 | 30  | 8270D  |
| 4,6-Dinitro-2-methylphenol  | < 0.34 | 2.7 (80 %R)      | 2.7 (82 %R) (3 RPD)     | 6/26/2018     | mg/kg | 30 - 130 | 30  | 8270D  |
| Benzoic Acid                | < 3.4  | < 3.4 (72 %R)    | < 3.4 (55 %R) (26 RPD)  | 6/26/2018     | mg/kg | 15 - 130 | 30  | 8270D  |
| N-Nitrosodimethylamine      | < 0.07 | 0.95 (57 %R)     | 1.0 (62 %R) (8 RPD)     | 6/26/2018     | mg/kg | 15 - 140 | 30  | 8270D  |
| n-Nitroso-di-n-propylamine  | < 0.07 | 1.1 (64 %R)      | 1.1 (69 %R) (7 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| n-Nitrosodiphenylamine      | < 0.07 | 1.3 (80 %R)      | 1.3 (80 %R) (1 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| bis(2-Chloroethyl)ether     | < 0.07 | 0.99 (59 %R)     | 1.1 (64 %R) (8 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| bis(2-chloroisopropyl)ether | < 0.07 | 0.95 (57 %R)     | 1.0 (60 %R) (5 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| bis(2-Chloroethoxy)methane  | < 0.07 | 1.1 (66 %R)      | 1.2 (73 %R) (9 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| 1,3-Dichlorobenzene         | < 0.07 | 1.0 (61 %R)      | 1.1 (65 %R) (7 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Acetophenone                | < 0.7  | 0.99 (59 %R)     | 1.1 (64 %R) (7 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| 1,4-Dichlorobenzene         | < 0.07 | 1.0 (61 %R)      | 1.1 (65 %R) (7 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| 1,2-Dichlorobenzene         | < 0.07 | 1.0 (62 %R)      | 1.1 (67 %R) (8 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| 1,2,4-Trichlorobenzene      | < 0.07 | 1.1 (67 %R)      | 1.2 (74 %R) (10 RPD)    | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| 2-Chloronaphthalene         | < 0.07 | 1.1 (69 %R)      | 1.2 (75 %R) (8 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| 4-Chlorophenyl-phenylether  | < 0.07 | 1.3 (78 %R)      | 1.3 (81 %R) (4 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| 4-Bromophenyl-phenylether   | < 0.07 | 1.4 (83 %R)      | 1.4 (84 %R) (2 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Hexachloroethane            | < 0.07 | 0.99 (59 %R)     | 1.1 (64 %R) (7 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Hexachlorobutadiene         | < 0.07 | 1.1 (69 %R)      | 1.3 (76 %R) (10 RPD)    | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Hexachlorocyclopentadiene   | < 0.34 | * < 0.34 (11 %R) | 0.35 (21 %R) (66 RPD) ! | 6/26/2018     | mg/kg | 15 - 140 | 30  | 8270D  |
| Hexachlorobenzene           | < 0.07 | 1.4 (85 %R)      | 1.4 (87 %R) (1 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| 4-Chloroaniline             | < 0.07 | 1.1 (66 %R)      | 1.2 (71 %R) (6 RPD)     | 6/26/2018     | mg/kg | 15 - 140 | 30  | 8270D  |
| 2,3-Dichloroaniline         | < 0.07 | 1.2 (74 %R)      | 1.3 (77 %R) (4 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| 2-Nitroaniline              | < 0.34 | 1.2 (72 %R)      | 1.2 (74 %R) (2 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| 3-Nitroaniline              | < 0.34 | 1.3 (75 %R)      | 1.3 (78 %R) (3 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| 4-Nitroaniline              | < 0.34 | 1.2 (75 %R)      | 1.3 (79 %R) (5 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Aniline                     | < 0.07 | 0.99 (59 %R)     | 1.1 (64 %R) (8 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Benzyl alcohol              | < 0.7  | 1.1 (66 %R)      | 1.2 (71 %R) (8 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Nitrobenzene                | < 0.07 | 1.1 (65 %R)      | 1.2 (70 %R) (8 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Isophorone                  | < 0.07 | 1.1 (67 %R)      | 1.2 (72 %R) (7 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| 2,4-Dinitrotoluene          | < 0.34 | 1.3 (80 %R)      | 1.4 (83 %R) (4 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| 2,6-Dinitrotoluene          | < 0.34 | 1.3 (79 %R)      | 1.3 (81 %R) (3 RPD)     | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Benzidine (estimated)       | < 0.34 | 0.35 (21 %R)     | 0.40 (24 %R) (14 RPD)   | 6/26/2018     | mg/kg | 1 - 200  | 50  | 8270D  |



# QC REPORT

EAI ID#: 183379

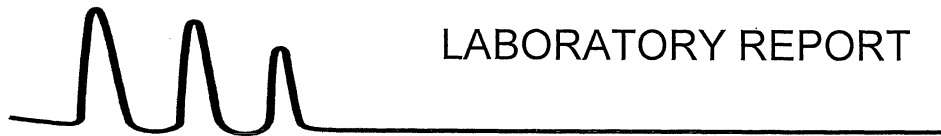
Client: KAS, Inc.

Batch ID: 636655-12911/S062518ABN1

Client Designation: BHA Riverside Avenue | 505180495

| Parameter Name              | Blank   | LCS          | LCSD                 | Analysis Date | Units | Limits   | RPD | Method |
|-----------------------------|---------|--------------|----------------------|---------------|-------|----------|-----|--------|
| Pyridine                    | < 0.34  | 0.89 (54 %R) | 0.97 (58 %R) (8 RPD) | 6/26/2018     | mg/kg | 15 - 140 | 30  | 8270D  |
| Azobenzene                  | < 0.07  | 1.2 (74 %R)  | 1.2 (75 %R) (1 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Carbazole                   | < 0.07  | 1.4 (81 %R)  | 1.4 (82 %R) (1 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Dimethylphthalate           | < 0.07  | 1.3 (78 %R)  | 1.4 (82 %R) (4 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Diethylphthalate            | < 0.34  | 1.3 (80 %R)  | 1.4 (83 %R) (3 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Di-n-butylphthalate         | < 0.34  | 1.5 (91 %R)  | 1.5 (89 %R) (2 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Butylbenzylphthalate        | < 0.34  | 1.5 (88 %R)  | 1.5 (90 %R) (3 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| bis(2-Ethylhexyl)phthalate  | < 0.34  | 1.4 (86 %R)  | 1.5 (88 %R) (3 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Di-n-octylphthalate         | < 0.34  | 1.4 (87 %R)  | 1.5 (88 %R) (1 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Dibenzofuran                | < 0.07  | 1.2 (74 %R)  | 1.3 (78 %R) (5 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Naphthalene                 | < 0.007 | 1.1 (66 %R)  | 1.2 (73 %R) (10 RPD) | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| 2-Methylnaphthalene         | < 0.007 | 1.2 (71 %R)  | 1.3 (77 %R) (8 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| 1-Methylnaphthalene         | < 0.007 | 1.2 (71 %R)  | 1.3 (76 %R) (6 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Acenaphthylene              | < 0.007 | 1.2 (71 %R)  | 1.2 (74 %R) (3 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Acenaphthene                | < 0.007 | 1.2 (70 %R)  | 1.2 (72 %R) (4 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Fluorene                    | < 0.007 | 1.2 (75 %R)  | 1.3 (78 %R) (5 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Phenanthrene                | < 0.007 | 1.3 (78 %R)  | 1.3 (79 %R) (1 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Anthracene                  | < 0.007 | 1.3 (79 %R)  | 1.3 (81 %R) (3 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Fluoranthene                | < 0.007 | 1.4 (82 %R)  | 1.4 (84 %R) (2 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Pyrene                      | < 0.007 | 1.4 (82 %R)  | 1.4 (86 %R) (5 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Benzo[a]anthracene          | < 0.007 | 1.3 (81 %R)  | 1.4 (83 %R) (3 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Chrysene                    | < 0.007 | 1.4 (85 %R)  | 1.4 (87 %R) (3 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Benzo[b]fluoranthene        | < 0.007 | 1.4 (82 %R)  | 1.4 (81 %R) (0 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Benzo[k]fluoranthene        | < 0.007 | 1.3 (77 %R)  | 1.3 (80 %R) (3 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Benzo[a]pyrene              | < 0.007 | 1.3 (79 %R)  | 1.3 (81 %R) (2 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Indeno[1,2,3-cd]pyrene      | < 0.007 | 1.3 (80 %R)  | 1.4 (81 %R) (2 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Dibenz[a,h]anthracene       | < 0.007 | 1.3 (80 %R)  | 1.4 (82 %R) (3 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| Benzo[g,h,i]perylene        | < 0.007 | 1.3 (76 %R)  | 1.3 (78 %R) (2 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| n-Decane                    | < 0.34  | 0.88 (53 %R) | 0.93 (56 %R) (6 RPD) | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| n-Octadecane                | < 0.34  | 1.3 (80 %R)  | 1.3 (79 %R) (1 RPD)  | 6/26/2018     | mg/kg | 40 - 140 | 30  | 8270D  |
| 2-Fluorophenol (surr)       | 64 %R   | 60 %R        | 66 %R                | 6/26/2018     | mg/kg | 30 - 130 | 30  | 8270D  |
| Phenol-d6 (surr)            | 68 %R   | 63 %R        | 70 %R                | 6/26/2018     | mg/kg | 30 - 130 | 30  | 8270D  |
| 2,4,6-Tribromophenol (surr) | 93 %R   | 93 %R        | 95 %R                | 6/26/2018     | mg/kg | 30 - 130 | 30  | 8270D  |
| Nitrobenzene-D5 (surr)      | 73 %R   | 66 %R        | 71 %R                | 6/26/2018     | mg/kg | 30 - 130 | 30  | 8270D  |
| 2-Fluorobiphenyl (surr)     | 80 %R   | 68 %R        | 74 %R                | 6/26/2018     | mg/kg | 30 - 130 | 30  | 8270D  |
| p-Terphenyl-D14 (surr)      | 85 %R   | 90 %R        | 93 %R                | 6/26/2018     | mg/kg | 30 - 130 | 30  | 8270D  |

Samples were extracted and analyzed within holding time limits. Instrumentation was calibrated in accordance with the method requirements. The method blanks were free of contamination at the reporting limits. Sample surrogate recoveries met the above stated criteria. The associated matrix spikes and/or Laboratory Control Samples met acceptance criteria. There were no exceptions in the analyses, unless noted. \*!Flagged analyte recoveries deviated from the QA/QC limits. Unless noted below, flagged analytes that exceed acceptance limits in the Quality Control sample were not detected in the field samples.



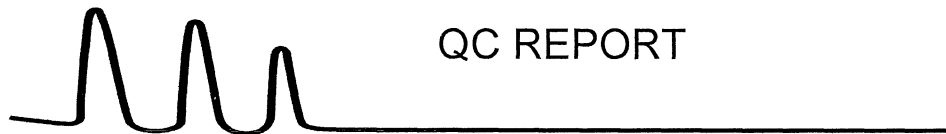
# LABORATORY REPORT

EAI ID#: 183379

Client: KAS, Inc.

Client Designation: BHA Riverside Avenue | 505180495

|                          |            |           |           |
|--------------------------|------------|-----------|-----------|
| Sample ID:               | SS-1 6-24" | SS-2 2-5' | SS-3 5-7' |
| Lab Sample ID:           | 183379.04  | 183379.05 | 183379.06 |
| Matrix:                  | soil       | soil      | soil      |
| Date Sampled:            | 6/20/18    | 6/20/18   | 6/20/18   |
| Date Received:           | 6/21/18    | 6/21/18   | 6/21/18   |
| Units:                   | mg/kg      | mg/kg     | mg/kg     |
| Date of Extraction/Prep: | 6/22/18    | 6/22/18   | 6/22/18   |
| Date of Analysis:        | 6/22/18    | 6/22/18   | 6/22/18   |
| Analyst:                 | MA         | MA        | MA        |
| Method:                  | 8100mod    | 8100mod   | 8100mod   |
| Dilution Factor:         | 1          | 1         | 1         |
| TPH (C9-C40)             | 130        | < 20      | < 20      |
| p-Terphenyl-D14 (surr)   | 80 %R      | 81 %R     | 75 %R     |



## QC REPORT

EAI ID#: 183379

Client: KAS, Inc.

Batch ID: 636651-85088/S062118TPHL11

Client Designation: BHA Riverside Avenue | 505180495

| Parameter Name         | Blank | LCS        | LCSD               | Analysis Date | Units | Limits   | RPD | Method  |
|------------------------|-------|------------|--------------------|---------------|-------|----------|-----|---------|
| TPH (C9-C40)           | < 20  | 62 (77 %R) | 59 (74 %R) (4 RPD) | 6/22/2018     | mg/kg | 30 - 160 | 30  | 8100mod |
| p-Terphenyl-D14 (surr) | 73 %R | 79 %R      | 75 %R              | 6/22/2018     | % Rec | 30 - 130 |     | 8100mod |

Samples were extracted and analyzed within holding time limits.

Instrumentation was calibrated in accordance with the method requirements.

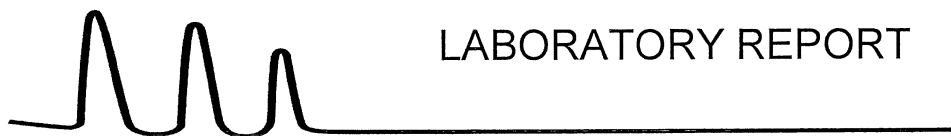
The method blanks were free of contamination at the reporting limits.

Sample surrogate recoveries met the above stated criteria.

The associated matrix spikes and/or Laboratory Control Samples met acceptance criteria.

There were no exceptions in the analyses, unless noted.

\*! Flagged analyte recoveries deviated from the QA/QC limits. Unless noted below, flagged analytes that exceed acceptance limits in the Quality Control sample were not detected in the field samples.



# LABORATORY REPORT

EAI ID#: 183379

Client: KAS, Inc.

Client Designation: BHA Riverside Avenue | 505180495

| Sample ID:               | SS-1 6-24" | SS-2 2-5' | SS-3 5-7' |
|--------------------------|------------|-----------|-----------|
| Lab Sample ID:           | 183379.04  | 183379.05 | 183379.06 |
| Matrix:                  | soil       | soil      | soil      |
| Date Sampled:            | 6/20/18    | 6/20/18   | 6/20/18   |
| Date Received:           | 6/21/18    | 6/21/18   | 6/21/18   |
| % Solid:                 | 90.4       | 93.3      | 94.5      |
| Units:                   | mg/kg      | mg/kg     | mg/kg     |
| Date of Extraction/Prep: | 6/28/18    | 6/28/18   | 6/28/18   |
| Date of Analysis:        | 7/2/18     | 7/2/18    | 7/2/18    |
| Analyst:                 | SG         | SG        | SG        |
| Extraction Method:       | 3540C      | 3540C     | 3540C     |
| Analysis Method:         | 8082A      | 8082A     | 8082A     |
| Dilution Factor:         | 1          | 1         | 1         |
| PCB-1016                 | < 0.02     | < 0.02    | < 0.02    |
| PCB-1221                 | < 0.02     | < 0.02    | < 0.02    |
| PCB-1232                 | < 0.02     | < 0.02    | < 0.02    |
| PCB-1242                 | < 0.02     | < 0.02    | < 0.02    |
| PCB-1248                 | < 0.02     | < 0.02    | < 0.02    |
| PCB-1254                 | < 0.02     | < 0.02    | < 0.02    |
| PCB-1260                 | < 0.02     | < 0.02    | < 0.02    |
| PCB-1262                 | < 0.02     | < 0.02    | < 0.02    |
| PCB-1268                 | < 0.02     | < 0.02    | < 0.02    |
| TMX (surr)               | 98 %R      | 97 %R     | 101 %R    |
| DCB (surr)               | 83 %R      | 86 %R     | 95 %R     |

Acid clean-up was performed on the samples and associated batch QC.



# QC REPORT

EAI ID#: **183379**

Client: **KAS, Inc.**

Batch ID: 636657-76775/S062818PCB1

Client Designation: **BHA Riverside Avenue | 505180495**

| Parameter Name | Blank  | LCS             | LCSD                      | Analysis Date | Units | Limits   | RPD | Method |
|----------------|--------|-----------------|---------------------------|---------------|-------|----------|-----|--------|
| PCB-1016       | < 0.02 | 0.12 (93 %R)    | 0.13 (95 %R) (2 RPD)      | 6/29/2018     | mg/kg | 40 - 140 | 30  | 8082A  |
| PCB-1221       | < 0.02 | < 0.02 (%R N/A) | < 0.02 (%R N/A) (RPD N/A) | 6/29/2018     | mg/kg |          |     | 8082A  |
| PCB-1232       | < 0.02 | < 0.02 (%R N/A) | < 0.02 (%R N/A) (RPD N/A) | 6/29/2018     | mg/kg |          |     | 8082A  |
| PCB-1242       | < 0.02 | < 0.02 (%R N/A) | < 0.02 (%R N/A) (RPD N/A) | 6/29/2018     | mg/kg |          |     | 8082A  |
| PCB-1248       | < 0.02 | < 0.02 (%R N/A) | < 0.02 (%R N/A) (RPD N/A) | 6/29/2018     | mg/kg |          |     | 8082A  |
| PCB-1254       | < 0.02 | < 0.02 (%R N/A) | < 0.02 (%R N/A) (RPD N/A) | 6/29/2018     | mg/kg |          |     | 8082A  |
| PCB-1260       | < 0.02 | 0.13 (99 %R)    | 0.13 (101 %R) (2 RPD)     | 6/29/2018     | mg/kg | 40 - 140 | 30  | 8082A  |
| PCB-1262       | < 0.02 | < 0.02 (%R N/A) | < 0.02 (%R N/A) (RPD N/A) | 6/29/2018     | mg/kg |          |     | 8082A  |
| PCB-1268       | < 0.02 | < 0.02 (%R N/A) | < 0.02 (%R N/A) (RPD N/A) | 6/29/2018     | mg/kg |          |     | 8082A  |
| TMX (surr)     | 90 %R  | 90 %R           | 91 %R                     | 6/29/2018     | % Rec | 30 - 150 | 30  | 8082A  |
| DCB (surr)     | 90 %R  | 88 %R           | 90 %R                     | 6/29/2018     | % Rec | 30 - 150 | 30  | 8082A  |

Samples were extracted and analyzed within holding time limits.

Instrumentation was calibrated in accordance with the method requirements.

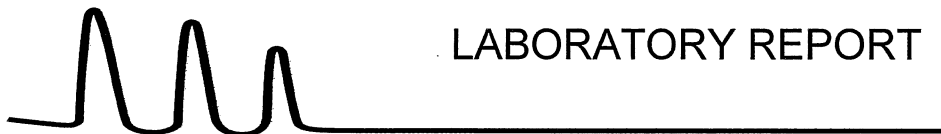
The method blanks were free of contamination at the reporting limits.

Sample surrogate recoveries met the above stated criteria.

The associated matrix spikes and/or Laboratory Control Samples met acceptance criteria.

There were no exceptions in the analyses, unless noted.

\*!! Flagged analyte recoveries deviated from the QA/QC limits. Unless noted below, flagged analytes that exceed acceptance limits in the Quality Control sample were not detected in the field samples.



# LABORATORY REPORT

EAI ID#: 183379

Client: KAS, Inc.

Client Designation: BHA Riverside Avenue | 505180495

Sample ID: SS-1 6-24" SS-2 2-5' SS-3 5-7'

Lab Sample ID: 183379.04 183379.05 183379.06

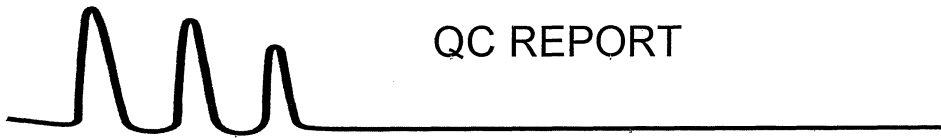
Matrix: soil soil soil

Date Sampled: 6/20/18 6/20/18 6/20/18

Date Received: 6/21/18 6/21/18 6/21/18

pH 7.83 7.35 7.09  
Corrosivity 7.83 7.35 7.09

| Units | Analysis |       | Method | Analyst |
|-------|----------|-------|--------|---------|
|       | Date     | Time  |        |         |
| SU    | 6/22/18  | 14:50 | 9045   | ATA     |
| SU    | 6/22/18  | 14:50 | 9045   | ATA     |



QC REPORT

EAI ID#: 183379

Client: KAS, Inc.  
Client Designation: BHA Riverside Avenue | 505180495

| Parameter Name | Blank | LCS           | LCSD                  | Units | Date of Analysis | Limits      | RPD | Method |
|----------------|-------|---------------|-----------------------|-------|------------------|-------------|-----|--------|
| pH             |       | 7.93 (99 %R)  | 7.90 (99 %R) (0 RPD)  | SU    | 6/22/18          | 7.89 - 8.07 | 10  | 9045   |
| Corrosivity    |       | 6.00 (100 %R) | 6.03 (101 %R) (0 RPD) | SU    | 6/22/18          | 5.95 - 6.07 | 10  | 9045   |

Samples were analyzed within holding times unless noted on the sample results page.  
Instrumentation was calibrated in accordance with the method requirements.  
The method blanks were free of contamination at the reporting limits.  
The associated matrix spikes and/or Laboratory Control Samples met the above stated criteria.  
Exceptions to the above statements are flagged or noted above or on the QC Narrative page.  
\*/! Flagged analyte recoveries deviated from the QA/QC limits.



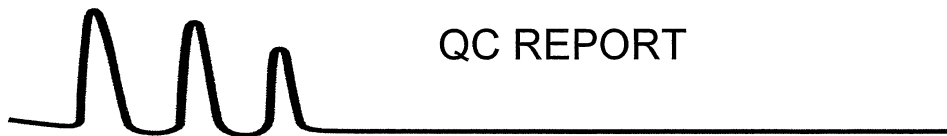
# LABORATORY REPORT

EAI ID#: 183379

Client: **KAS, Inc.**

Client Designation: **BHA Riverside Avenue | 505180495**

| Sample ID:     | SS-1 6-24" | SS-2 2-5' | SS-3 5-7' |                   |       |                  |        |         |
|----------------|------------|-----------|-----------|-------------------|-------|------------------|--------|---------|
| Lab Sample ID: | 183379.04  | 183379.05 | 183379.06 |                   |       |                  |        |         |
| Matrix:        | soil       | soil      | soil      |                   |       |                  |        |         |
| Date Sampled:  | 6/20/18    | 6/20/18   | 6/20/18   |                   |       |                  |        |         |
| Date Received: | 6/21/18    | 6/21/18   | 6/21/18   | Analytical Matrix | Units | Date of Analysis | Method | Analyst |
| Arsenic        | 6.1        | 5.2       | 4.6       | SolTotDry         | mg/kg | 6/22/18          | 6020   | DS      |
| Barium         | 75         | 28        | 20        | SolTotDry         | mg/kg | 6/22/18          | 6020   | DS      |
| Cadmium        | < 0.5      | < 0.5     | < 0.5     | SolTotDry         | mg/kg | 6/22/18          | 6020   | DS      |
| Chromium       | 27         | 17        | 16        | SolTotDry         | mg/kg | 6/22/18          | 6020   | DS      |
| Lead           | 75         | 13        | 5.4       | SolTotDry         | mg/kg | 6/22/18          | 6020   | DS      |
| Mercury        | < 0.1      | < 0.1     | < 0.1     | SolTotDry         | mg/kg | 6/22/18          | 6020   | DS      |
| Selenium       | < 0.5      | < 0.5     | < 0.5     | SolTotDry         | mg/kg | 6/22/18          | 6020   | DS      |
| Silver         | < 0.5      | < 0.5     | < 0.5     | SolTotDry         | mg/kg | 6/22/18          | 6020   | DS      |



# QC REPORT

EAI ID#: **183379**

Client: **KAS, Inc.**

Client Designation: **BHA Riverside Avenue | 505180495**

| Parameter Name | Blank | LCS           | LCSD | Units | Date of Analysis | Limits   | RPD | Method |
|----------------|-------|---------------|------|-------|------------------|----------|-----|--------|
| Arsenic        | < 0.5 | 39 (98 %R)    | NA   | mg/kg | 6/22/18          | 80 - 120 |     | 6020   |
| Barium         | < 0.5 | 41 (101 %R)   | NA   | mg/kg | 6/22/18          | 80 - 120 |     | 6020   |
| Cadmium        | < 0.5 | 38 (95 %R)    | NA   | mg/kg | 6/22/18          | 80 - 120 |     | 6020   |
| Chromium       | < 0.5 | 40 (100 %R)   | NA   | mg/kg | 6/22/18          | 80 - 120 |     | 6020   |
| Lead           | < 0.5 | 41 (101 %R)   | NA   | mg/kg | 6/22/18          | 80 - 120 |     | 6020   |
| Mercury        | < 0.1 | 0.44 (109 %R) | NA   | mg/kg | 6/22/18          | 80 - 120 |     | 6020   |
| Selenium       | < 0.5 | 38 (95 %R)    | NA   | mg/kg | 6/22/18          | 80 - 120 |     | 6020   |
| Silver         | < 0.5 | 42 (104 %R)   | NA   | mg/kg | 6/22/18          | 80 - 120 |     | 6020   |

Samples were analyzed within holding times unless noted on the sample results page.

Instrumentation was calibrated in accordance with the method requirements.

The method blanks were free of contamination at the reporting limits.

The associated matrix spikes and/or Laboratory Control Samples met the above stated criteria.

Exceptions to the above statements are flagged or noted above or on the QC Narrative page.

\*! Flagged analyte recoveries deviated from the QA/QC limits.

## CHAIN-OF-CUSTODY RECORD

183379

BOLD FIELDS REQUIRED. PLEASE CIRCLE REQUESTED ANALYSIS.

| SAMPLE I.D. | SAMPLING DATE / TIME<br>*If COMPOSITE, INDICATE BOTH START & FINISH DATE / TIME | MATRIX (SEE BELOW)<br>GRAB/*COMPOSITE | VOC  |                    | SVOC              |                                  | TCLP  | METALS            | INORGANICS                                   |                               |   |  | MICRO  | OTHER            | # of CONTAINERS | NOTES<br>MeOH VIAL # |                                       |
|-------------|---|---------------------------------------|--|--------------------|-------------------|----------------------------------|-------|-------------------|--|-------------------------------|---|--|--|------------------|-----------------|----------------------|---------------------------------------|
|             |   |                                       | 524.2 BTEX<br>524.2 MTBE ONLY<br>624 VTG<br>1, 4 DIOXANE | 8021 BTEX<br>HALOS | 8015 GRO<br>MANPH | 8270 625 STYICS<br>EDB<br>BN PAH | LI L2 | 8015 DRO<br>MAEPH | PEST 608<br>PCB 608<br>PEST 8081<br>PCB 8083 | OIL & GREASE 1664<br>TPH 1664 | TCLP 1311<br>ABN<br>VOC<br>PEST<br>HERB | DISSOLVED METALS (LIST BELOW)<br>TOTAL METALS (LIST BELOW) | TS TSS TDS SPEC CON.<br>Ba Cl F SO <sub>4</sub><br>NO <sub>2</sub> NO <sub>3</sub> NO <sub>3</sub> NO <sub>2</sub> | BOD CBOD T. ALK. |                 |                      | TKN NH <sub>3</sub> T. PHOS. O. PHOS. |
| SB-4 1-2'   | 6/20/18 1251  | SG                                    | X  |                    |                   |                                  |       |                   |  |                               |   |  |  |                  |                 | 1                    | 45765                                 |
| SB-5 3-5'   | 6/20/18 1311  | SG                                    | X  |                    |                   |                                  |       |                   |  |                               |   |  |  |                  |                 | 1                    | 45766                                 |
| SB-4 5-6'   | 6/20/18 1323  | SG                                    | X  |                    |                   |                                  |       |                   |  |                               |   |  |  |                  |                 | 1                    | 45767                                 |
| SS-1 6-24"  | 6/20/18 905-1305  | SC                                    |  |                    |                   | XX                               | X     |                   | X  |                               |   |  | X  |                  |                 | 3                    | —                                     |
| SS-2 2-5'   | 6/20/18 905-1305  | SC                                    |  |                    |                   | XX                               | X     |                   | X  |                               |   |  | X  |                  |                 | 3                    | —                                     |
| SS-3 5-7'   | 6/20/18 905-1378  | SC                                    |  |                    |                   | XX                               | X     |                   | X  |                               |   |  | X  |                  |                 | 3                    | —                                     |
| Trip Blank  | Lab Prepared  | —                                     | X  |                    |                   |                                  |       |                   |  |                               |   |  |  |                  |                 | 1                    | 45768                                 |

MATRIX: A-Air; S-Soil; GW-Ground Water; SW-Surface Water; DW-Drinking Water; WW-Waste Water  
PRESERVATIVE: H-HCL; N-HNO<sub>3</sub>; S-H<sub>2</sub>SO<sub>4</sub>; Na-NaOH; M-MEOH

PROJECT MANAGER: Jeremy Roberts  
 COMPANY: KAS, Inc.  
 ADDRESS: PO Box 787  
 CITY: Williston STATE: VT ZIP: 05495  
 PHONE: 802-383-0486 EXT.:  
 FAX: 802-383-0490  
 E-MAIL: Jeremy.R@KAS-consulting.com  
 SITE NAME: Bitter Riverside Avenue  
 PROJECT #: 505180495  
 STATE: NH MA ME VT OTHER:  
 REGULATORY PROGRAM: NPDES: RGP POTW STORMWATER OR  
 GWP, OIL FUND, BROWNFIELD OR OTHER:  
 QUOTE #: PO #:

DATE NEEDED:

QA/QC  
REPORTING LEVEL  
A B CREPORTING OPTIONS  
PRELIMS ☒ YES OR NOTEMP. 38 °C  
ICE? ☒ YES NOMETALS: 8 RCRA 13 PP Fe, Mn Pb, Cu

OTHER METALS:

SAMPLES FIELD FILTERED? ☐ YES ☐ NO

NOTES: (IE: SPECIAL DETECTION LIMITS, BILLING INFO, IF DIFFERENT)

OR  
PRESUMPTIVE CERTAINTY ☒ E-MAIL ☒ PDF EQUIS EXCEL

SAMPLER(S):

RELINQUISHED BY:

DATE:

TIME:

RECEIVED BY:

RELINQUISHED BY:

DATE:

TIME:

RECEIVED BY:

RELINQUISHED BY:

DATE:

TIME:

RECEIVED BY:

SITE HISTORY:

SUSPECTED CONTAMINATION:

FIELD READINGS:



Eastern Analytical, Inc.

professional laboratory and drilling services

25 CHENELL DRIVE | CONCORD, NH 03301 | TEL: 603.228.0525 | 1.800.287.0525 | E-MAIL: CUSTOMERSERVICE@EASTERNANALYTICAL.COM | WWW.EASTERNANALYTICAL.COM

(WHITE: ORIGINAL GREEN: PROJECT MANAGER)