



TENNESSEE DEPARTMENT OF TRANSPORTATION ASBESTOS INSPECTION REPORT

SR-16 Bridge over Boiling Fork Creek
Bridge ID Number 26SR0160011
Franklin County, Tennessee



Prepared by:



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54 Lindsley Avenue
Nashville, Tennessee 37210

September 14, 2015
KSWA Project Number: 100-15-0048

Kollan Spradlin

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Tennessee Asbestos Inspector Accreditation [A-I-96275-44129]

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1.0 INTRODUCTION

This report presents the findings of an inspection for asbestos-containing materials completed on the bridge identified in Section 1.1. The inspection was completed in accordance with the State of Tennessee, Department of Transportation Environmental Division, Social and Cultural Resources Office, Hazardous Materials Section requirements.

1.1 TDOT BRIDGE IDENTIFICATION

The bridge is identified in the TDOT Project System/Bridge Management System as:

TDOT PE Number: 26004-4242-04
TDOT PIN Number: 119958.00
Bridge Inventory Number: 26SR0160011
Termini: SR-16 over Boiling Fork Creek in Winchester
Log Mile Number: 12.73

1.2 GENERAL DESCRIPTION

The SR-16 Bridge over Boiling Fork Creek is a 294-foot, 2-lane, 6-span Bridge constructed of concrete T-beams with a concrete deck and an asphalt wearing surface. The bridge was constructed in 1941 and is scheduled for repair. No coatings were encountered on the bridge during field activities. **Figure – 1** shows the general location of the bridge.

2.0 INSPECTION

The identification of asbestos-containing materials (ACM) is performed by collecting bulk samples of suspect materials and having those samples analyzed by a laboratory. Asbestos-containing materials (ACM) are those materials found to contain greater than one percent asbestos by calibrated visual area estimation (CVAE) using Polarized Light Microscopy (PLM).

Bulk sampling is a procedure in which representative homogeneous sampling areas in a structure are identified and then sampled. A homogeneous sampling area is defined as an area that contains material of the same type (uniform in color and texture) and is applied during the same general time period. Once the homogeneous sampling areas are identified, bulk samples of suspect materials are obtained at the discretion of our inspectors, based on site conditions and past experience.

2.1 PERSONNEL AND DATE(S) OF INSPECTION

The sampling and field activities were performed on August 14, 2015 by Mr. Kollan Spradlin. Mr. Spradlin is an accredited State of Tennessee Asbestos Inspector. A copy of Mr. Spradlin's current accreditation from the State of Tennessee is included in **Appendix A**. Field activities were conducted under a Health and Safety Plan (**Appendix B**) and an Activity Hazard Analysis (**Appendix C**) prepared prior to mobilizing to the site.

2.2 VISUAL SURVEY

KSWA's survey began with a visual survey of the bridge. The visual survey consisted of:

- sketching the structure and/or verifying the plans provided
- locating and identifying homogeneous areas of suspect materials that may contain asbestos minerals
- determining applicable sampling locations

Table-1 lists the homogeneous areas identified during our visual survey.

2.3 ACCESS TO BRIDGE COMPONENTS

Individual bridge components were accessed by the following methods.

2.3.1 Concrete Piers – Homogeneous Area A

The concrete piers were accessed and sampled from beneath the bridge.

2.3.2 Concrete Abutments/Wingwalls – Homogeneous Area B

The concrete abutments/wingwalls were accessed and sampled from the shoulders and beneath the bridge.

2.3.3 Black Abutment Joint Compound – Homogeneous Area C

The black abutment joint compound was accessed and sampled from the shoulders and beneath the bridge.

2.3.4 Concrete Decking – Homogeneous Area D

The concrete decking was accessed and sampled from the shoulders and beneath the bridge.

2.3.5 Concrete Beams – Homogeneous Area E

The concrete beams were accessed and sampled from beneath the bridge.

2.3.6 Concrete Guardrails – Homogeneous Area F

The concrete guardrails were accessed and sampled from the top and shoulders of the bridge.

2.3.7 Concrete Sidewalks– Homogeneous Area G

The concrete sidewalks were accessed and sampled from the top and shoulders of the bridge.

2.3.8 Asphalt Overlay – Homogeneous Area H

The asphalt overlay was accessed from the top and shoulders of the bridge.

2.3.9 Cementitious Deck Drains – Homogeneous Area I

The cementitious deck drains were accessed and sampled from below the bridge.

2.3.10 Cementitious Utility Pipes – Homogeneous Area J

The cementitious utility pipes were accessed and sampled from the shoulders and beneath the bridge.

2.3.11 Gray Joint Compound – Homogeneous Area K

The gray joint compound was accessed and sampled from the top and shoulders of the bridge.

Table – 1: Bridge Component Descriptions

Homogeneous Area	Description	Sample Numbers
A	Concrete Piers	BF-1, BF-2, BF-3
B	Concrete Abutments/Wingwalls	BF-4, BF-5, BF-6
C	Black Abutment Joint Compound	BF-7, BF-8, BF-9
D	Concrete Decking	BF-10, BF-11, BF-12
E	Concrete Beams	BF-13, BF-14, BF-15
F	Concrete Guardrails	BF-16, BF-17, BF-18
G	Concrete Sidewalks	BF-19, BF-20, BF-21
H	Asphalt Overlay	BF-22, BF-23, BF-24
I	Cementitious Deck Drains	BF-25, BF-26, BF-27
J	Cementitious Utility Pipes	BF-28, BF-29, BF-30
K	Gray Joint Compound	BF-31, BF-32, BF-33

3.0 ANALYTICAL PROCEDURES

3.1 ASBESTOS ANALYSIS PROCEDURES

The bulk samples are analyzed in the laboratory using Polarized Light Microscopy (PLM) coupled with dispersion staining. PLM is an analytical method for asbestos identification, which identifies the specific asbestos minerals by their unique optical properties. The optical properties are a result of the mineral's chemical composition, physical atomic structure, and visual morphology. This is the U.S. Environmental Protection Agency (EPA) recommended method of analysis for asbestos identification in bulk samples.

In most instances samples from each homogeneous area are analyzed on a “first positive stop” basis. “First positive stop” means that if one sample from a homogeneous area of material is found to contain greater than one percent asbestos, the remaining samples from that homogeneous area are not analyzed and the material is assumed to contain asbestos. In addition, samples which contain multiple layers, or that have associated mastic or adhesive backing, are analyzed as two or more separate samples. Samples that are identified to contain 1% or less asbestos minerals have been point counted by the laboratory for confirmation.

3.2 LABORATORY NAME AND ACCREDITATION

The bulk samples collected for this inspection were analyzed by a laboratory that has received accreditation from the National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP). The name and accreditation number of the analytical laboratory that analyzed the samples for this inspection are indicated in **Table - 2**:

Table – 2: Analytical Laboratory

Laboratory	EMSL Analytical, Inc.
NVLAP Number	102104-0

4.0 REGULATORY OVERVIEW

4.1 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

The EPA's National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations (40 CFR 61, Subpart B) requires that all regulated asbestos-containing materials (RACM) be properly removed prior to any renovation or demolition activities that will disturb them. These regulations define RACM as:

- Friable ACM.
- Category I non-friable ACM that has become friable.
- Category I non-friable ACM that will be or has been subject to sanding, grinding, cutting, or abrading.
- Category II non-friable ACM that has a high probability of becoming, or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

4.1.1 Definitions

Significant definitions related to regulation of asbestos under NESHAPS include:

Friable asbestos-containing material (ACM), is defined by the Asbestos NESHAP, as any material containing more than one percent (1%) asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy (PLM), that, when dry, can be crumbled, pulverized or reduced to powder by hand pressure. (Sec. 61.141)

Non-friable ACM is any material containing more than one percent (1%) asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy (PLM), that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. EPA also defines two categories of non-friable ACM, Category I and Category II non-friable ACM, which are described as follows:

Category I non-friable ACM is any asbestos-containing packing, gasket, resilient floor covering or asphalt roofing product which contains more than one percent (1%) asbestos as determined using polarized light microscopy (PLM) according to the method specified in Appendix A, Subpart F, 40 CFR Part 763. (Sec. 61.141)

Category II non-friable ACM is any material, excluding Category I non-friable ACM, containing more than one percent (1%) asbestos as determined using polarized light microscopy according to the methods specified in Appendix A, Subpart F, 40 CFR Part 763 that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. (Sec. 61.141)

"Regulated Asbestos-Containing Material" (RACM) is (a) friable asbestos material, (b) Category I non-friable ACM that has become friable, (c) Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting or abrading, or (d) Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

Friable materials are defined as those which can be crumbled, pulverized, or reduced to powder by hand pressure when dry. The NESHAP regulations also establish specific notification and control requirements for renovation and demolition work.

5.0 RESULTS

The results of the asbestos inspection are presented in the following sections.

5.1 RESULTS OF ASBESTOS BULK SAMPLE ANALYSIS

Thirty-three samples were obtained from the SR-16 Bridge over Boiling Fork Creek. Multiple samples of each homogeneous area were collected in accordance with State of Tennessee, Department of Transportation Environmental Division, Social and Cultural Resources Office, Hazardous Materials Section requirements and delivered to the laboratory for visual observation and microscopic analysis. The samples were selected based on homogeneous areas of suspect materials, as described in Section 2.2.

Building material homogeneous areas sampled included: concrete piers, concrete abutments/wingwalls, black abutment joint compound, concrete decking, concrete beams, concrete guardrails, concrete sidewalks, asphalt overlay, cementitious deck drains, cementitious utility pipes, and gray joint compound. Photographs of the subject Franklin County Bridge are presented in **Appendix D** and the analytical results of all the samples collected from the property, along with the chain-of-custody records, are included in **Appendix E**.

Of the various material sampled, the black abutment joint compound and the cementitious utility pipes was found to be asbestos-containing. The cementitious utility pipes appeared to be interlocking sections of pre-manufactured pipe. The general condition of the sections was fair, however, many of the sections were no longer attached to each other and small sections of PVC pipe had been inserted. The cementitious utility pipes were located in a pipe rack that held 9 pipes and ran along the western side of the bridge. The eastern side of the bridge exhibited one steel pipe that was not sampled due to the steel composition. **Table – 3** summarizes the various sampled materials which were found to contain asbestos. Photographs of the homogeneous areas sampled that tested positive for containing asbestos or are presumed to contain asbestos, as well as pictures of other bridge components, are presented in Appendix D.

Table – 3: Materials Containing Asbestos

Sample No.	HA	Material Description	Location (Bridge Component)	Approx. Qty.	Friable (Y/N)	Type Asbestos and Content
BF-7	C	Black Abutment Joint Compound	Northeast	150 square feet	No	5% Chrysotile
BF-8	C	Black Abutment Joint Compound	Northeast	150 square feet	No	First Positive Stop
BF-9	C	Black Abutment Joint Compound	Southwest	150 square feet	No	First Positive Stop
BF-28	J	Cementitious Pipe	Southwest	2750 linear feet of 6" diameter pipe	No	20% Chrysotile
BF-27	J	Cementitious Pipe	Southwest	2750 linear feet of 6" diameter pipe	No	First Positive Stop
BF-28	J	Cementitious Pipe	Northwest	2750 linear feet of 6" diameter pipe	No	First Positive Stop

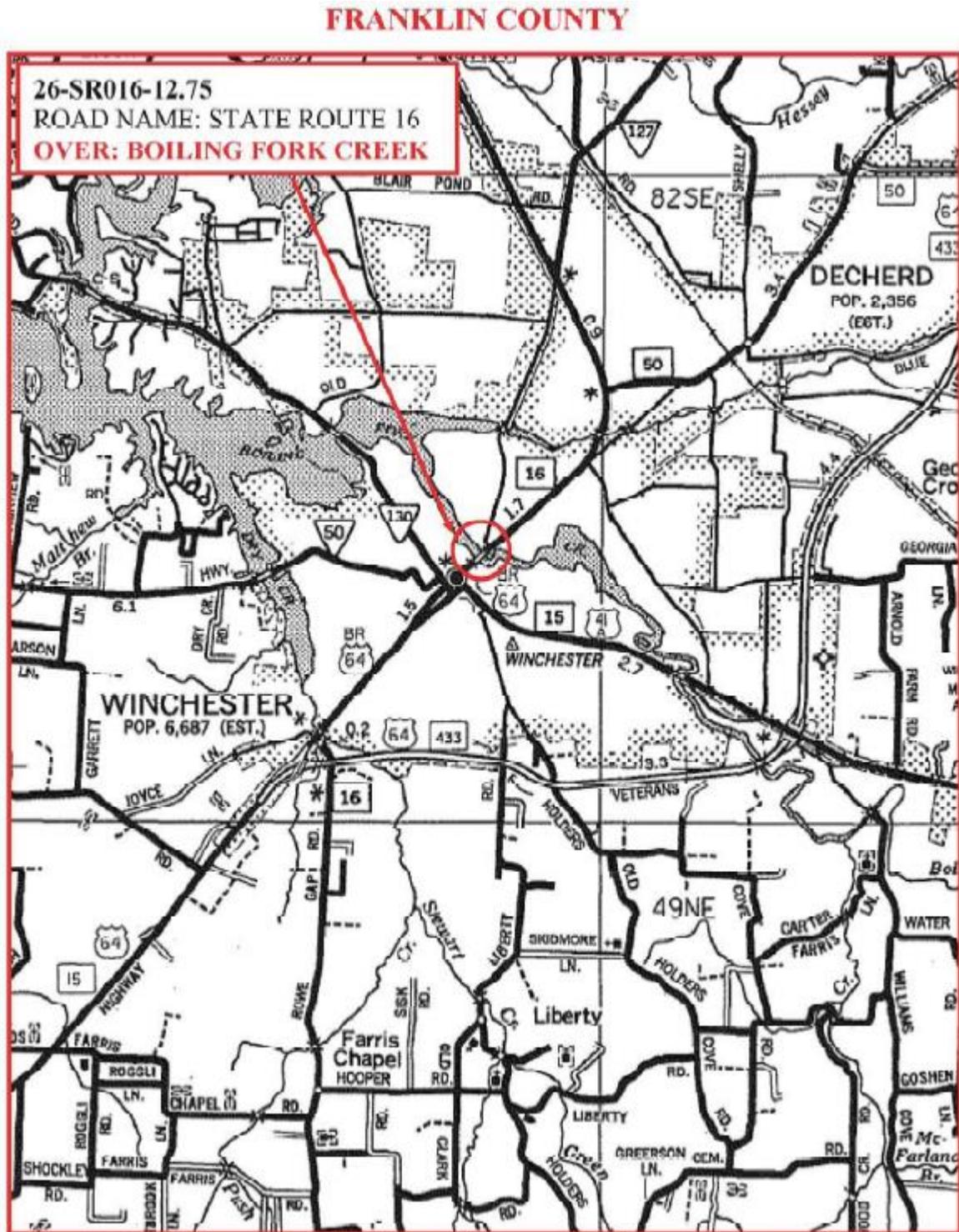
*Sample was not analyzed. Presumed to be asbestos-containing using "First Positive Stop" (FPS) method

6.0 QUALIFICATIONS

The information presented herein is based on information obtained during the site visit and from previous experience. If additional information becomes available which might impact our conclusions or recommendations, K. S. Ware & Associates, L.L.C. requests the opportunity to review the information, reassess the potential concerns, and modify opinions, if warranted.

This report has been prepared on behalf of the Tennessee Department of Transportation. This document is not a Bid Document or a Contract Document. Use of this report or reliance upon information contained in this report by any other party implies an agreement by that party to the same terms and conditions under which service was provided. Furthermore, any party, other than our Client, relying on this document is cautioned that all conclusions made or decisions arrived at based on their review of this document are those solely of the third party, without warranty, guarantee or promise by the author. These findings are relevant to the dates of our services and should not be relied upon to represent conditions at substantially earlier or later dates.

Figure – 1: Site Vicinity Map Franklin County



APPENDIX A: ASBESTOS INSPECTION PERSONNEL ACCREDITATIONS

THE STATE OF TENNESSEE

Department of Environment and Conservation
Division of Solid Waste Management
Toxic Substances Program



Initial

Kollan L. Spradlin

DOB	Sex	HGT	WGT
13-Aug-1987	M	5' 8"	185

Discipline	Accreditation	Expiration
Inspector	A-1-96275-44129	Jun-30-2016

Asbestos Accreditation

APPENDIX B: HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN FOR ASBESTOS SURVEY SERVICES

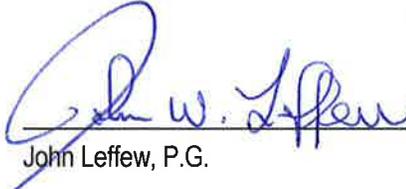
K. S. WARE AND ASSOCIATES, L.L.C.

54 Lindsley Ave.
Nashville, Tennessee 37210

Project Number: 100-15-0048
Name: Termini: SR-16 over Boiling Fork Creek, LM 12.73 in Winchester
Location: Franklin County, Tennessee
Client: Tennessee Department of Transportation
Client Contact : Kyle Kirschenmann
Phone No.: (615) 253-2470

Review and Approval:

Health and Safety Officer


John Leffew, P.G. August 11, 2015
Date

Field Safety Coordinator


Kollan Spradlin, E.I. August 11, 2015
Date

Project Manager


Kollan Spradlin, E.I. August 11, 2015
Date

Responsibilities for Field Safety Coordinator:

- Primary on-site contact for KSWA's health and safety procedures during field activities.
- Has the authority to stop KSWA operations if conditions are judged to be hazardous to on-site personnel or the public.
- Perform discretionary audits to determine compliance of Health and Safety Plan requirements.
- Responsible for providing access to the health and safety for all on-site employees.
- Responsible for instructing on-site personnel on the location of emergency communication equipment (i.e. phones and radios as necessary).
- Has no responsibility for health and safety procedures of any contractor, subcontractor, client personnel or others on the site.

Date of Plan Preparation

July 28, 2015

Dates of Planned Field Activities

August 14, 2015

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1.0 PURPOSE

The purpose of this health and safety plan (HASP) is to provide standards for worker safety and protection during field activities conducted on a frequent or routine basis. The plan outlines standards and mandatory procedures relative to physical and chemical hazards encountered at sites, communication, training, worker health monitoring, decontamination procedures and levels of personal protection. Any questions concerning this information should be directed to the K.S. Ware and Associates, L.L.C. (KSWA) Project Manager identified on the cover of this Health and Safety Plan, at 615-255-9702.

2.0 APPLICABILITY

This plan is applicable to all personnel working at above referenced site, where mandatory worker health and safety training is required by State or Federal agencies. It is intended for use at the above referenced site where information regarding potential site hazards is available in the form of background research, personal communication with past or present property owners or workers, previous sampling results, etc.

Available information should be provided to site workers as outlined in Section 6.1 A site specific hazard evaluation is included in Section 5.

Activities to which this plan is applicable may include sampling of items that may contain asbestos containing material (ACM); and other routine field activities. Activities involving contact with unknown substances and activities on sites where little background information is available will require more extensive and specific HASP development.

This plan does not cover procedures for entry into confined spaces. Project-specific attachments should be prepared and appended to this Health and Safety Plan if those activities are planned. Work of this nature shall be performed in accordance with 29 CFR 1926.250 subpart P "Excavation, Trenching and Shoring", 29 CFR 1910.146 "Permit Required Confined Space Entry" and the KSWA "Employee Confined Space Entry Program".

3.0 SITE DESCRIPTION AND HISTORY

The project consists of performing an Asbestos Survey in Franklin County Tennessee on a bridge located on SR-16 over Boiling Fork Creek. The bridge is a 294-foot, two-lane, six-span bridge constructed of concrete T-beams with a concrete deck and asphalt wearing surface. The bridge is numbered 26SR0160011. This bridge was constructed in 1941 and is scheduled to be repaired.

3.1 BRIDGE INSPECTION EQUIPMENT

KSWA will be on site to perform an asbestos survey on the Franklin County Bridge. Equipment to be used during the survey will include asbestos sample collection equipment.

3.2 WORK PRECAUTIONS

- No eating, drinking, using tobacco products, chewing gum, or putting hands in mouth while on the site.
- Wear the TDOT required roadway safety gear (hard hat, Class III reflective vest, boots) at all times while on the project site.
- Wear gloves at applicable times while at the work site.
- Wear protective eyewear at applicable times while at the work site.
- Wash all exposed skin areas with soap and water before departing from the site.
- Remove and change any non-impervious clothing that becomes contaminated during site activities.
- Do not go anywhere on the site other than where directed by the Field Safety Coordinator.
- Use safe and legal procedures for sample storage and shipment.

3.3 DISPOSAL RESTRICTIONS

Treat disposable items as ordinary refuse except when gross contamination is expected. In the event that refuse including disposable personnel protective equipment is suspected of being contaminated, the refuse will be collected and stored on site for future disposal.

4.0 HAZARD EVALUATION

4.1 PHYSICAL HAZARDS

4.1.1 Operational Hazards

Prior to commencement of field activities, the Field Safety Coordinator will conduct a site reconnaissance to identify any visible or operational hazards.

Additionally, because there is a possibility that asbestos may be present at the site, the appropriate Personal Protective Equipment (PPE) will be worn at all times that work is being performed.

4.1.2 Fall Hazards

Field activities can have the potential for fall hazards. Be aware of any uneven terrain, clear paths of debris and materials that may be a hazard. While on the bridges, be aware of slick surfaces and gaps while accessing the different components.

4.1.3 Heat Stress

Field activities in hot climates create a potential for heat stress. The warning symptoms of heat stress include fatigue; loss of strength, reduced accuracy, comprehension and retention; reduced alertness and mental capacity. To prevent heat stress, personnel shall receive adequate water supplies and electrolyte replacement fluids, and maintain scheduled work/rest periods. Pulse rate and body temperature shall also be monitored as appropriate.

4.1.4 Cold Stress

Field activities in cold climates create a potential for cold stress. The warning symptoms of cold stress include reduced coordination, drowsiness, impaired judgment, fatigue, and numbing of the toes, fingers, nose and ears. To prevent cold stress, personnel shall wear appropriate clothing and maintain scheduled work test periods, with rest periods taken in a sheltered and heated location.

4.1.5 Tools and Equipment

Tools and equipment used by KSWA shall be inspected and maintained to be safe and adequate for their designated use. Housekeeping of the site shall be maintained as to prevent trip hazards.

4.1.6 Traffic Hazard

Field activities will encounter traffic on this project. Be aware of the surroundings and watch for traffic.

4.1.7 Noise Hazard

Operation of equipment may present a noise hazard to workers. KSWA personnel will be provided with hearing protection to be utilized when noise levels are excessive.

4.1.8 Water Hazard

Field activities for this project will be conducted over the water and from a boat. All occupants of the boat must wear floatation devices while on the water. Safe boating practices must be exercised while the boat is in operation. Conducting field activities over the water, no person shall lean over the guardrail or parapit.

Precautions: In order to reduce the health and safety risk to workers due to physical hazards at the project site, the following precautions will be observed:

1. ANSI Class III High Visibility clothing will be worn by personnel at all times on the project site.
2. Hard hats shall include high visibility reflective tape.
3. Protective eyewear will be worn by personnel in the work area when appropriate.
4. Hearing protection will be worn by personnel as deemed necessary by the Field Safety Coordinator (typically noised levels greater than 85 db).
5. Steel toed boots with non-conductive soles will be worn by personnel at all times on the project site.
6. Hand protection (leather gloves) will be worn by personnel when moving and/or lifting equipment as well as when using large hand tools (machetes, sledges, shovels, etc.).
7. All equipment and related support equipment and vehicles shall have a daily safety inspection (29 CFR 1926.550). The inspections shall include, but are not limited to; all hydraulic lines and fittings for wear and damage, all cable systems and pull ropes for damage and proper installation, exhaust systems and drill controls, electrical lines for damage and/or contact with standing water, etc. Inspection schedules, the vehicle and equipment description, nomenclature, the license plate or ID number for the equipment, the findings of the inspections and the corrective action taken shall be maintained.
8. Before beginning each work shift, the area will be checked for site hazards including overhead lines, underground lines, above ground obstructions, tripping hazards, etc.
9. All vehicles will be fitted with a cab-top rotating or strobe light bar. Light bar is to be active when vehicle is on site.
10. All workers shall use floatation devices while on the boat.

4.1.9 Asbestos Containing Material

Collecting samples from bridge components may release asbestos fibers into the air. KSWA personnel will wear a respirator while sampling, and all sampling equipment will be properly decontaminated between samples and after field activities. KSWA personnel will limit exposure by adhering to this health and safety plan.

4.2 CHEMICAL HAZARDS

Chemical hazards are not anticipated at this site.

4.3 BIOLOGICAL HAZARDS

4.3.1 Stinging Insects

The most common stinging insects are bees, wasps and ants. Few species of ants have medically important stings. While most bees possess a defensive sting, and will sting if grasped or crushed, only a few social species sting often enough, or have sufficiently venomous stings to be of medical significance. These include the honeybees and the bumblebees. Most fatalities from bee and wasp stings occur in hypersensitive individuals; death is most often induced by a single sting, and occurs most often within 1 hour after the sting. The victim is typically over 40 years of age and stung on the head or neck. Most deaths are caused by respiratory dysfunction with the second most common cause being anaphylaxis; arteriosclerosis may be a compounding factor. If stung, seek medical attention immediately.

5.0 COMMUNICATIONS AND TRAINING

Workers at State and Federally listed or recognized sites must be provided with adequate information and training to recognize and evaluate potential hazards. Training shall comply with applicable regulations including 29 CFR 1910.1200 "Hazard Communication Standard".

5.1 COMMUNICATION

The Field Safety Coordinator shall supply all on site personnel with readily available access to this Health and Safety Plan. This plan shall cover, at a minimum, the following topics:

- A. A brief description of the history of the location with regards to health and environmental hazards.
- B. A description of the activities to which the hazard evaluation summary is applicable.
- C. A description of any hazards which may be encountered, including:
 1. Physical Hazards - terrain, traffic, equipment, severe weather (heat stress and frostbite), electrical hazards, noise.
 2. Chemical Hazards - materials used and stored at the site, materials released at the site.
 3. Biological Hazards - insects, plants, animals, pathogens, and infectious materials.
- D. A description of the levels of protection selected for the operation.
- E. Equipment decontamination procedure if different from those specified herein.
- F. Summary of emergency contacts for use in the event of fire, explosion, medical emergency or other emergency, including the location of the nearest telephone and an address and phone number to provide to emergency personnel.
- G. A map showing the route to the nearest hospital.

Prior to any employee or subcontractor beginning work on the site, the Field Safety Coordinator shall brief all KSWA employees as well as subcontractors on the contents of this plan. Personnel will have the opportunity to review the plan, and ask questions about the planned work or hazards. Also, a brief site reconnaissance will be completed to familiarize the personnel with site conditions, boundaries, and physical hazards.

By KSWA voluntarily sharing this information with subcontractors and contractors, those firms are not relieved of the responsibility to provide their personnel with adequate and proper supervision, safety information, instruction, and equipment.

5.2 HEALTH AND SAFETY TRAINING

All personnel will be provided with approved health and safety training as outlined in 29 CFR 1910.120(e). Documentation for KSWA employees should also be maintained at a central location at the KSWA office.

5.3 RESPIRATOR USAGE TRAINING AND FIT TESTING

Prior to assignment to a site where respirator use may be required, employees will be provided with respirator training as outlined in 29 CFR 1910.134(e)(5). Respirator fit tests are to be conducted at 6 to 10 month intervals, or at any time when a condition that may change the fit of a respirator has occurred, such as change in weight, change in facial structure, extensive dental work, etc. All use of respirators shall comply with KSWA's written respiratory program.

6.0 SITE CONTROL - WORK ZONES

It is anticipated that conditions will require special measures to achieve site security or restriction of normal site activities and access. The work area includes a 294-foot, six-span bridge. The work will be performed along the side and underneath the bridge. The work zone will be delineated in accordance with TDOT temporary lane closure guidelines. Work zones will be identified with flashing lights, illuminated and non-illuminated signage, traffic spotter, etc.

7.0 PERSONAL PROTECTION

PPE and safety requirements must be appropriate to protect against the known or worst potential hazards on the site. Protective equipment should be selected based on the concentrations and possible routes of exposure to known or potential worst case substances. The levels of PPE are described in Section 8. All KSWA engineering or assessment personnel engaged in work on site will be participants in the KSWA medical monitoring program described in Section 12, or a similar program.

It is anticipated that Level D protection and basic site safety measures will be sufficient at this project site. Any conditions warranting upgrading of the required level of protection to Level B or A will be cause for all personnel to immediately leave the work site. The site will be re-evaluated and a new site Health and Safety Plan will be prepared which incorporates the additional site information.

Whenever Level C is in use, the breathing zone of the workers will also be monitored constantly utilizing a photoionization detector (PID). If the total volatile organic concentration (as indicated by the PID) in the breathing zone of the workers approaches 50 ppm, work shall cease and the crew will exit the work area and evaluate the need to upgrade to Level B.

The specific respiratory protective device selected for Level C protection shall be the device identified on each individual's respirator fit test, as described in Section 5.3. In general, respirators will be supplied with combination cartridges for organic vapors, dusts, mists and acid gasses and shall be approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health. In the event that a site hazard evaluation summary identifies the potential for exposure to other chemical substances (i.e. formaldehyde, ammonia), additional cartridges will be supplied as necessary to be made available at the site.

8.0 LEVELS OF PROTECTION

This plan is not intended for use at sites where levels of protection above Level C are required. Levels C and D are described below.

8.1 LEVEL C

Level C protection should be selected when the types and concentrations of respirable materials are known, have adequate warning properties, or are reasonably assumed to be not greater than the protection factors associated with air-purifying respirators; and exposure to the few unprotected areas of the body (i.e., neck and back of head) is unlikely to cause harm. Continuous monitoring of the site and/or individuals should be established.

8.1.1 Personal Protective Equipment

The following equipment is necessary for Level C personal protection:

- Half-face or full-face air-purifying respirator (OSHA/NIOSH approved).
- Chemical-resistant outer clothing.
- Gloves - inner (tight-fitting, chemical-resistant type or woven liners).
- Gloves - outer (chemical resistant).
- Hardhat (face shield optional).
- Boots - outer (chemical-protective).
- Safety glasses.

8.1.2 Criteria for Use of Level C

The following criteria identify situations in which Level C PPE should be employed:

- Site known to contain potentially hazardous materials resulting in air concentrations requiring a protection factor afforded by a full-face or half-face air-purifying respirator (OSHA/NIOSH approved).
- Well-documented, reliable history of site and patterns of prior entry.
- No evidence to suspect acute or chronic toxicity to exposed skin.
- Total vapor reading between 0 ppm and 50 ppm on instruments such as the photoionization detector or organic vapor analyzer.
- Continuous air or personal monitoring should occur while wearing Level C protection.

8.2 LEVEL D

Level D is the basic work uniform and for all site operations. Level D should be selected when performing environmental sampling involving dilute concentrations of contaminants on sites that have been characterized by previous analyses or research.

8.2.1 Personal Protective Equipment

The following equipment is necessary for Level D personal protection:

- Standard work clothing.
- Optional disposable chemical-resistant clothing appropriate for known or expected levels of contamination.
- Boots/Shoes - safety or chemical-resistant boots.
- Safety glasses or safety goggles.
- Gloves - disposable latex or nitrile.
- Optional moisture resistant outer gloves.
- Hardhat.

8.2.2 Criteria for Use of Level D

The following criteria indicate situations where Level D personal protection is adequate:

- No indication of airborne health hazards present.
- No gross indication, above background concentrations, on the photoionization detector and/or organic vapor analyzer.

Additionally, a half-face or full-face respirator will be used

9.0 DECONTAMINATION PROCEDURES

9.1 PERSONNEL DECONTAMINATION

If Level D protection is used, any disposable inner gloves or protective clothing should be sealed in a plastic bag and disposed of properly. Moisture resistant outer gloves and outer boots should be scrubbed with a stiff brush in soapy water, then rinsed to remove possible residual contamination. Disposable equipment should be used whenever possible.

If Level C or greater protection is used, personnel are required to follow the decontamination procedures listed below, as they apply to the gear being worn:

- A. Wash boots thoroughly with clean water or an appropriate cleaning solution to remove gross contaminants.
- B. Scrub down outer boots in decon solution and rinse with water.
- C. Remove boots.
- D. If wearing reusable raingear, it should be cleaned in a similar manner as the boots.
- E. Disposable Tyveks should be removed and placed in trash receptacle.
- F. Spent cartridges can also be discarded in the trash receptacle.
- G. Remove outer gloves and wash in same manner as boots while wearing disposable inner gloves.
- H. Use a new set of disposable gloves to clean additional equipment including hard hat, safety glasses, etc.
- I. Decontamination wash and rinse water will be allowed to percolate into the ground or as specified.

9.2 EQUIPMENT DECONTAMINATION

Proper decontamination of all equipment is necessary to avoid transferring contaminants from the site, thereby increasing potential for exposure of on site and off site personnel. The measures described below should be followed prior to leaving all sites, as applicable to the equipment being used. Any variations from the procedures described below for reasons of worker health or safety must be described by the Project Manager in the site-specific hazard summary.

These measures are separate from, and may not be substituted for, other decontamination procedures associated with proper sampling protocol.

- A. The equipment may be thoroughly rinsed with clean water or an appropriate cleaning solution and wiped dry with paper towels before leaving the work site. Alternatively, they may be wrapped in absorbent material and/or stored in plastic bags sealed to prevent contact with workers, vehicles, etc.
- B. The rinse water from this operation will be allowed to percolate into the ground or as specified.
- C. Decontamination of asbestos inspection equipment will take place at the site prior to moving to subsequent locations. Decontamination of such equipment will entail a thorough steam cleaning, or washing and rinsing of the equipment with high pressure water followed by air drying. In addition, the tires and undercarriages of vehicles exiting areas identified as having surficial hazardous materials will be sprayed with high pressure water and allowed to dry before leaving the contaminated area.

10.0 EMERGENCY PROCEDURES

10.1 INHALATION

If warning signals such as: dizziness, nausea, headache, shortness of breath, burning sensation in mouth, throat or lung or symptoms specific to hazard found at the site are apparent, the victim should leave the contaminated air space immediately. Have someone contact emergency services and obtain health and safety information about potential contaminants.

If unconscious, the victim should be pulled out of the contaminated area immediately if they do not have any injuries which would prohibit moving them (i.e. spinal injury). The rescuers should make sure that the area is safe to enter. If the area cannot be safely entered, attempt to ventilate this area. Do not attempt a rescue. Rescuers should make sure they are properly trained in First Aid and rescue and that they are wearing proper respiratory and protective equipment before attempting the rescue.

If the victim is no longer breathing, mouth-to-mouth resuscitation or some other form of artificial respiration should administered by a person who is properly trained and certified in a location away from the contaminated area.

Medical attention should be obtained as soon as possible.

10.2 SKIN EXPOSURE

The skin should be washed with copious amounts of soap and water. If clothing is contaminated, it should be removed immediately and the skin washed thoroughly with running water. If a shower is available, it should be used immediately. Clothes should be removed while showering. This procedure may be life-saving as certain highly toxic chemicals are rapidly absorbed through the skin.

All contaminated parts of the body, including the hair, should be thoroughly decontaminated. It may be necessary to wash repeatedly.

10.3 INGESTION

A poison control center or emergency service should be contacted immediately to determine an appropriate course of action. If possible, have health and safety information on the poison available when you call for help. Vomiting should be induced except when the substance presents an aspiration hazard, such as from a petroleum product; or when the substance is a strong acid or base. To induce vomiting, a tablespoon of salt or powdered mustard in a glass of warm water, or syrup of ipecac from the First Aid Kit, can be taken as an emetic.

Drinking plenty of water and placing a finger down the throat may also be effective in inducing vomiting. The treatment should be repeated until vomit is clear.

Medical attention should be obtained immediately.

10.4 EYES

If a toxicant should get in the eyes, they should be washed with plenty of water. The eye itself should be held open, rotated, and flooded with water so that all surfaces are washed thoroughly. Washing should be continued for at least 15 minutes.

Medical attention should be obtained immediately.

10.5 EXPOSURE TO HEAT OR COLD

When working under severe weather conditions, personnel should be aware of the signs of heat stress, hypothermia and frostbite as well as the appropriate response actions.

Heat Stress - If a worker shows signs of heat stroke (dry, hot, red skin, high body temperature) or heat exhaustion (cool, moist, pale or red skin, dilated pupils, nausea, dizziness), the worker must be removed from the work area and cooled. Loosen clothing, elevate feet, and provide cool liquids. Heat stroke can be life threatening and requires rapid action.

Hypothermia - If a worker shows signs of hypothermia (shivering, impaired judgement, drowsiness, clumsiness) the worker must be removed from the work area and warmed gradually.

Frostbite - If a worker shows signs of frostbite (skin color changes to white or grayish-yellow then grayish-blue), the worker must be moved to a warm place. The affected area should be placed in warm (100-105°F) water. Do not rub or massage.

10.6 STINGS AND BITES

If still present, remove stinger with fingernail. Wash the the location of the sting with soap and water, cover with bandage and apply ice. If severe allergic reactions appear (hives, itching, rash, nausea, vomiting, dizziness, swelling) seek medical attention immediately.

10.7 PERSONAL INJURY

A first aid kit shall be readily available in case of an injury. Administer first aid and/or seek medical help, if necessary. Medical emergencies take precedence over decontamination procedures. A map showing the route to the nearest hospital is provided at the end of this Health and Safety Plan. In the event that a phone is not readily available on-site, it is the responsibility of the field safety coordinator to identify the location of the nearest phone and provide this information to all on site personnel.

10.8 SPILL OR RELEASE OF HAZARDOUS MATERIAL

Clean up, isolate or contain spill as appropriate. Contact emergency response personnel, project manager, and/or client company officials as appropriate.

10.9 POTENTIAL OR ACTUAL FIRE/EXPLOSION

If it is safe to do so, on site personnel may use available fire fighting equipment to control or extinguish the fire, and remove or isolate materials which may contribute to the fire. Contact the fire department project manager and/or client company officials as appropriate.

10.10 EVACUATION

In the event of an emergency that requires an evacuation of the site, verbal instruction will be given by the Field Safety Coordinator to evacuate the area. Personnel will immediately exit the site to the pre-designated upwind "clean" location. The Field Safety Coordinator will account for KSWA personnel, and will advise personnel of further instructions, if necessary. The Field Safety Coordinator will also advise responding off site emergency personnel, if necessary. Personnel shall not re-enter the site until the emergency conditions have been corrected and the Field Safety Coordinator has authorized re-entry.

11.0 EMERGENCY CONTACTS

<u>Agency</u>	<u>Number</u>
Fire	<u>911</u>
Ambulance	<u>911</u>
Police	<u>911</u>

Nearest Medical Facility:

Southern Tennessee Medical Center
185 Hospital Road
Winchester, Tennessee 37398

KSWA Personnel Contact Information:

<u>Title</u>	<u>Name</u>	<u>Work</u>	<u>Mobile</u>
Project Manager	Kollan Spradlin	(615) 255-9702	(615) 429-5862
Health and Safety Officer	John Leffew	(615) 255-9702	(615) 889-0557
Field Safety Coordinator	Kollan Spradlin	(615) 255-9702	(615) 429-5862

12.0 MEDICAL MONITORING

All engineering and assessment personnel engaged in on site activities shall be participants in a medical monitoring program similar to the following. As participants in this program, these individuals will have had recent physical examinations.

The primary goal of this medical monitoring program is to provide evaluation and ongoing surveillance of the health status of employees potentially exposed to toxic substances as a result of their work-related activities. An active health monitoring program for those employees potentially at risk is an important tool in evaluating the effects of chronic low-level exposures or acute exposures related to operations at hazardous waste sites. The effects of low-level exposures may not become apparent until years after the initial exposure.

This medical monitoring program includes laboratory testing, personnel medical history evaluation, physical examination and other specific testing.

Each participant in this medical monitoring program undergoes a complete occupational history evaluation and baseline physical examination including the following parameters:

- Pulmonary Function Studies
- Complete Blood Count
- Chemical Blood Profile
- Urinalysis
- Chest X-Ray
- Electrocardiogram
- Specific parameters as necessary dependent upon exposure

Following the establishment of each participant's baseline values for the above parameters, an annual re-evaluation is conducted to monitor potential changes due to work with hazardous materials.

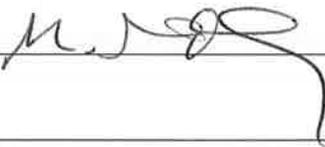
In addition to this annual re-examination, provisions are made for specific post-exposure examinations in the event of a suspected exposure during a particular field event.

The program shall meet or exceed the minimum requirements established in OSHA standard 20 CFR 1910.120.

13.0 PERSONNEL AUTHORIZATION

All personnel engaged in on site activities must read this Health and Safety Plan. By signing and dating this form, the listed individual acknowledges that he/she has read, understands and will comply with the requirements of this Health and Safety Plan.

Personnel Authorized to Enter Site

<u>Name</u>	<u>Signature</u>	<u>Date</u>
Kellan Spradlin		8/14/15
Mohammed Naser		8/14/15

14.0 FIELD SAFETY COORDINATOR'S SUMMARY

(To be completed by Field Safety Coordinator after completion of each phase of field work, and returned to Health and Safety Officer.)

Project Summary

Project Name:	TDOT SR-16 over Boiling Fork Creek (26SR0160011)
Project Number:	100-15-0048
Activities Completed:	6/14/15
Date of Activities:	August 14, 2015

During the execution of the activities covered by this Health and Safety Plan, there were:

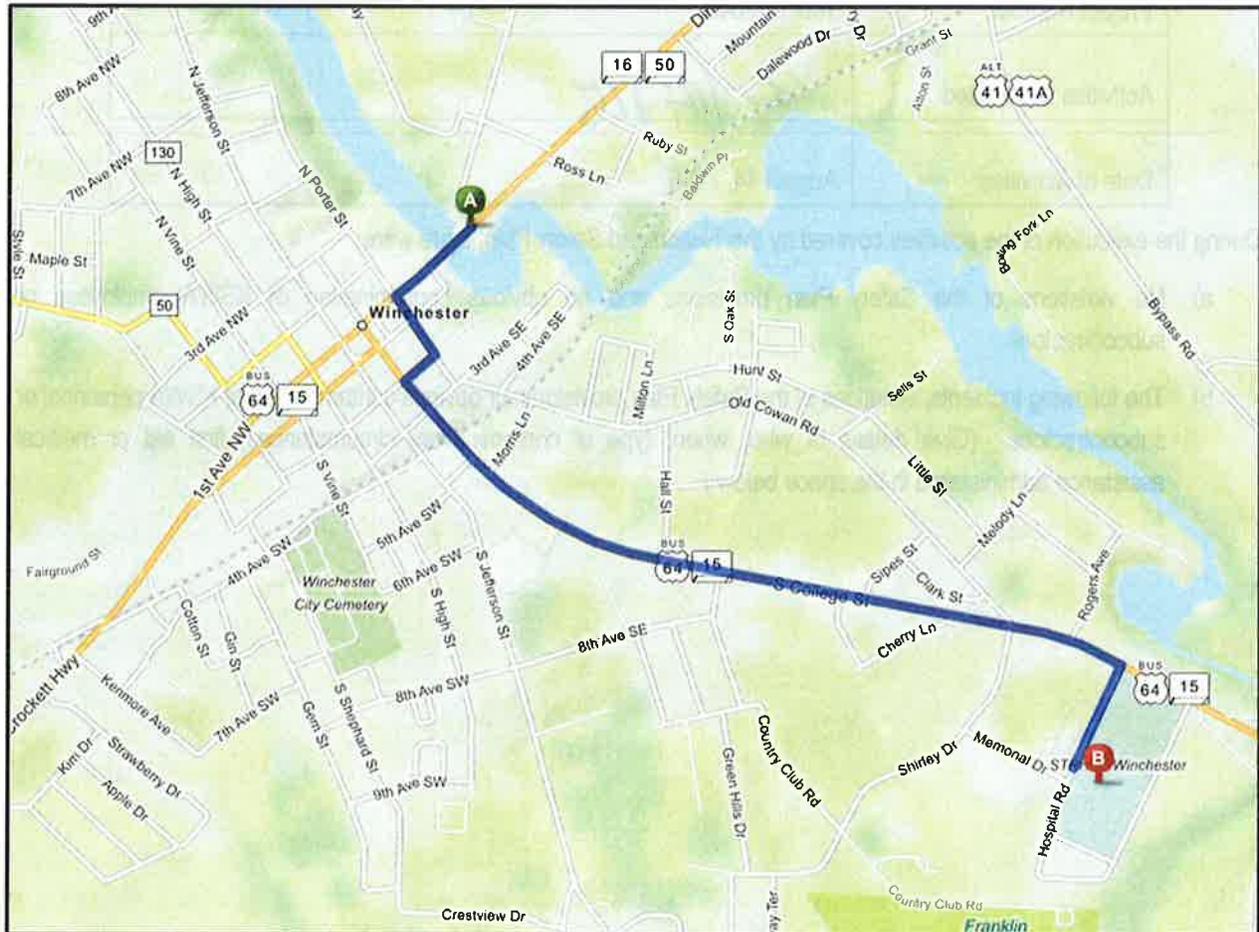
- a) No violations of the Safety Plan provisions and no obvious contamination of KSWA employees or subcontractors.
- b) The following incidents, violations of the Safety Plan provisions, or obvious contamination of KSWA personnel or subcontractors. (Give details of who, when, type of contamination, circumstances, first aid or medical assistance administered in the space below.)

Signature 
Field Safety Coordinator

Date 8/14/15

Directions to Hospital

- Head southwest on Dinah Shore Blvd, 0.2 Miles
- Turn left onto S Jefferson St, 285 Feet
- Turn left onto 1st Ave SE, 236 Feet
- Turn right onto US-41AS/S College St, 1.4 Miles
- Turn right onto Hospital Road



APPENDIX C: ACTIVITY HAZARD ANALYSIS

ACTIVITY HAZARD ANALYSIS

Asbestos Survey
SR-16 over Boiling Fork Creek, LM 12.73 in Winchester
Franklin County, Tennessee

PIN: 119958.00
PE: 26004-4242-04
Bridge Number: 26SR0160011

KSWA Project Number: 100-15-0048

Prepared by:



K. S. WARE AND ASSOCIATES, L.L.C
54 Lindsley Avenue
Nashville, Tennessee 37210

August 4, 2015

ACTIVITY HAZARD ANALYSIS FOR ASBESTOS SURVEY

EM 385-1-1 Reference:

Hard hats and steel toe boots are mandatory. Eye and hearing protection are mandatory during sampling and as appropriate.

<u>Principal Steps</u>	<u>Potential Hazards</u>	<u>Action to Minimize Hazard</u>
1. Asbestos exposure	1. Inhalation, skin irritation	1. All personnel that will be present on the project must wear the proper PPE. Use all safety precautions to insure that all state and federal guidelines are followed and to limit the exposure to asbestos. Asbestos samplers are to use a respirator when sampling.
2. Heat stress exposure	2. Heat stroke.	2. Monitor all personnel for signs of fatigue, dizziness or other physical abnormalities. Personnel should wear clothing suited for the weather conditions and breaks will be given for intake of fluids, etc.
3. Traffic Hazards	3. Moving vehicles	3. Field activities may encounter traffic on various projects. Be aware of your surroundings, watch for traffic when performing in areas that have moving vehicles. Use a spotter or traffic control when sampling in the roadway or crossing the road. Maintain safe positioning when possible.
4. Site Maintenance	4. Slip, trip, and fall.	4. Prior to field activities, the Field Safety Officer should observe the terrain on site and monitor the conditions throughout the survey. Be aware of steep and/or rocky slopes. Also be aware of pot holes around the bridge.
5. Overhead Utilities	5. Electrocution, explosion, fire.	5. Be aware of fallen or low hanging utility lines while on the ground level. Remain at least 10 feet from all utility lines with all equipment.
6. Biological Hazards	6. Small animals, insects	6. Be aware of animal habitat in and around the work area. Do not put hands into areas you cannot inspect for potential insect, animal and snake hazards. Beware of waterborne snakes and colonies of stinging insects
7. Noise	7. Damage to hearing	7. Operations that generate sound levels 85 dBA and above require hearing protection. Either muffs or plugs are acceptable. Heavy traffic can be a cause.
8. Hand/Finger Protection	8. Physical injury to personnel	8. Wear gloves when there is exposure to potential hazards that could produce scrapes and cuts. Do not wear jewelry. Any jewelry can be dangerous. Handle sharp or pointed tools with extreme care. Be careful when using a hammer to not smash hand or fingers. Use the proper gloves for the job at hand.
9. Hand Tools and Equipment	9. Physical injury to personnel	9. Use the right tool or piece of equipment for the job. Use only tools in safe condition. Tools and equipment must be used properly and not abused.
10. Ladders	10. Fall from excessive height	10. Use caution and maintain three points of contact when climbing a ladder. Always have other site personnel support the ladder while in use. Maintain a safe distance from overhead utilities and obstructions.

<u>Principal Steps</u>	<u>Potential Hazards</u>	<u>Action to Minimize Hazard</u>
11. Waterways/watercraft	11. Falling overboard, collision with objects and other watercraft	11. Safe boating practices shall be exercised by all occupants of the boat at all times. All occupants shall wear floatation devices while on the boat. The watercraft shall be maintained at a safe speed.

This Activity Hazard Analysis has been prepared by K.S. Ware and Associates.

The KSWA field safety coordinator for this project will be Mr. Kollan Spradlin. Mr. Spradlin's health and safety training and certifications include:

- OSHA Certified 10 Hours of Site Worker Safety
- OSHA 40 Hour HAZWOPER
- American Red Cross CPR and AED Certified

APPENDIX D: PHOTOGRAPHS



Photo 1: View of the SR-16 Bridge over Boiling Fork Creek in Franklin County, TN

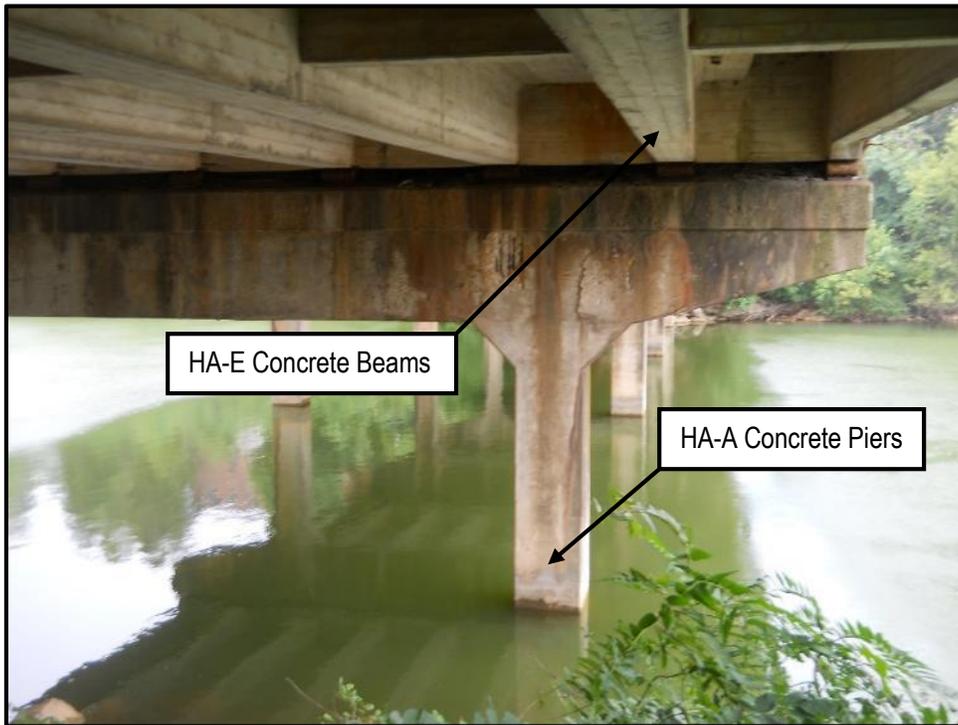


Photo 2: View of HA-A and HA-E from underneath the SR-16 Bridge over Boiling Fork Creek

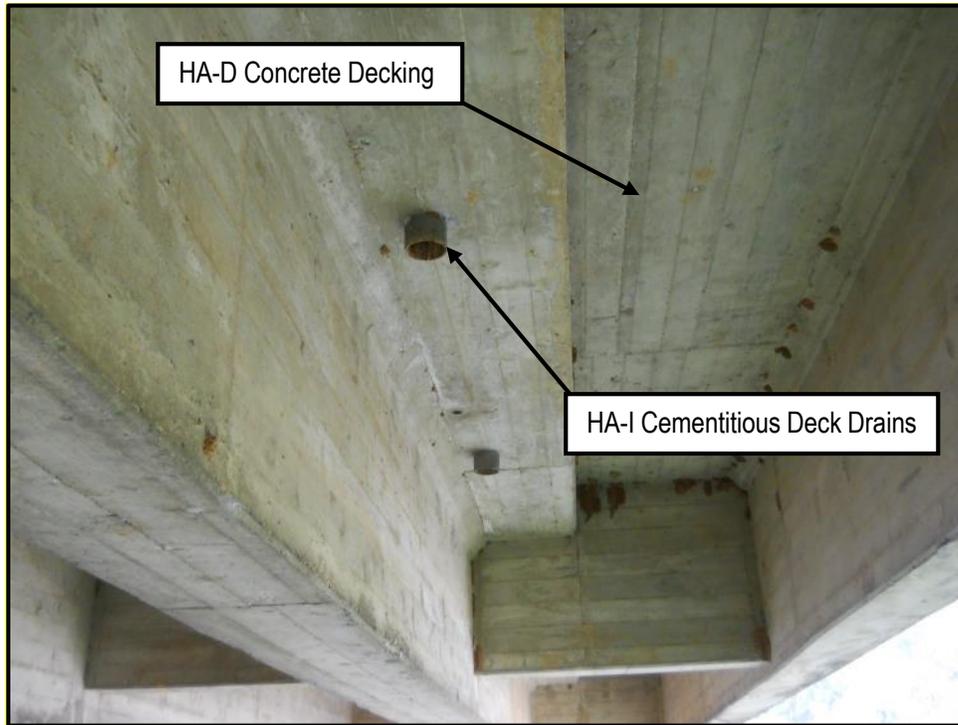


Photo 3: View of HA-D and HA-I from below the SR-16 Bridge over Boiling Fork Creek



Photo 4: View of HA-C from underneath the SR-16 Bridge over Boiling Fork Creek



Photo 5: View of HA-B from underneath the SR-16 Bridge over Boiling Fork Creek

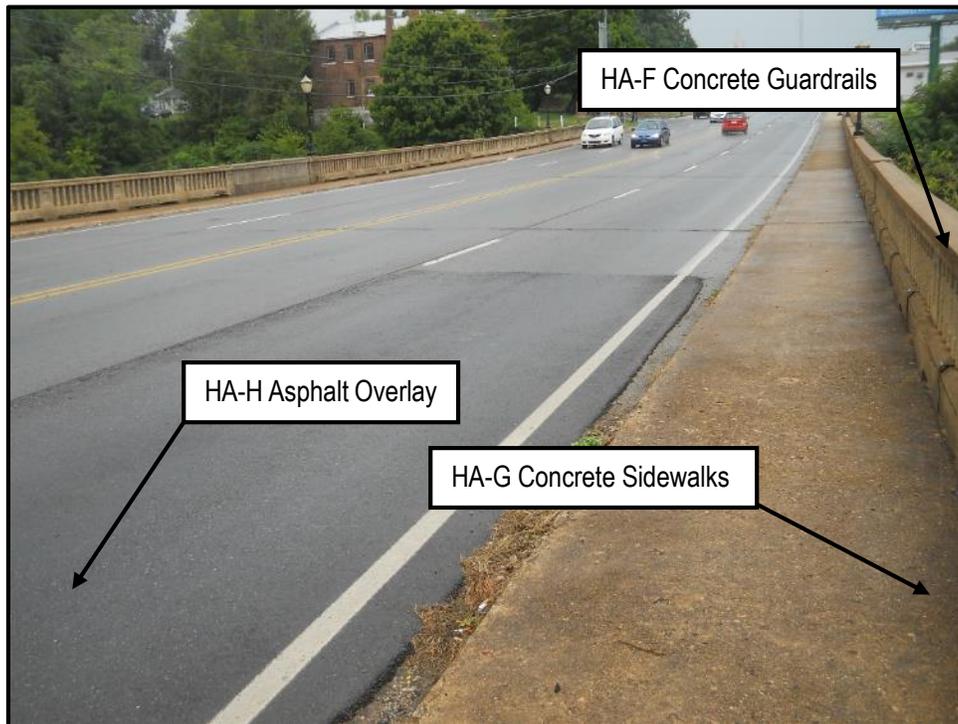


Photo 6: View of HA-F, HA-G, and HA-H from the top of the SR-16 Bridge over Boiling Fork Creek



Photo 7: View of HA-K from the top of the SR-16 Bridge over Boiling Fork Creek



Photo 8: View of HA-J from the top of the SR-16 Bridge over Boiling Fork Creek



Photo 8: View of the general condition of HA-J



Photo 9: View of the eastern side of the bridge with the steel pipe that was not sampled

APPENDIX E: ASBESTOS SAMPLE LABORATORY ANALYSIS DATA



EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Bulk Building Material Chain of Custody

EMSL Order Number (Lab Use Only):

4485

Kernersville, NC 27284
PHONE: (336) 992-1025
FAX: (336) 992-4175

Company: K.S. Ware & Associates, LLC		EMSL-Bill to: <input checked="" type="checkbox"/> Same <input type="checkbox"/> Different <small>If Bill to is Different note instructions in Comments**</small>	
Street: 54 Lindsley Ave.		<i>Third Party Billing requires written authorization from third party</i>	
City: Nashville	State/Province: TN	Zip/Postal Code: 37210	Country: United States
Report To (Name): Kollan Spradlin		Telephone #: 615-255-9702	
Email Address: kspradin@kswarellc.com		Fax #:	Purchase Order:
Project Name/Number: 100-15-0048		Please Provide Results: <input type="checkbox"/> Fax <input checked="" type="checkbox"/> Email <input type="checkbox"/> Mail	
U.S. State Samples Taken: TN		CT Samples: <input type="checkbox"/> Commercial/Taxable <input type="checkbox"/> Residential/Tax Exempt	

Turnaround Time (TAT) Options* - Please Check

3 Hour
 6 Hour
 24 Hour
 48 Hour
 72 Hour
 96 Hour
 1 Week
 2 Week

*For TEM Air 3 hr through 6 hr, please call ahead to schedule *There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide

<p style="text-align: center;">PLM - Bulk (reporting limit)</p> <p><input checked="" type="checkbox"/> PLM EPA 600/R-93/116 (<1%)</p> <p><input type="checkbox"/> PLM EPA NOB (<1%)</p> <p>Point Count <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%)</p> <p>Point Count w/Gravimetric <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%)</p> <p><input type="checkbox"/> NIOSH 9002 (<1%)</p> <p><input type="checkbox"/> NY ELAP Method 198.1 (frnable in NY)</p> <p><input type="checkbox"/> NY ELAP Method 198.6 NOB (non-frnable-NY)</p> <p><input type="checkbox"/> OSHA ID-191 Modified</p> <p><input type="checkbox"/> Standard Addition Method</p>	<p style="text-align: center;">TEM - Bulk</p> <p><input type="checkbox"/> TEM EPA NOB - EPA 600/R-93/116 Section 2.5.5.1</p> <p><input type="checkbox"/> NY ELAP Method 198.4 (TEM)</p> <p><input type="checkbox"/> Chatfield Protocol (semi-quantitative)</p> <p><input type="checkbox"/> TEM % by Mass - EPA 600/R-93/116 Section 2.5.5.2</p> <p><input type="checkbox"/> TEM Qualitative via Filtration Prep Technique</p> <p><input type="checkbox"/> TEM Qualitative via Drop Mount Prep Technique</p> <p style="text-align: center;">Other</p> <p><input type="checkbox"/></p>
---	--

Check For Positive Stop - Clearly Identify Homogenous Group **Date Sampled:** 8/14/2015

Samplers Name: Kollan Spradlin **Samplers Signature:**

Sample #	HA #	Sample Location	Material Description
BF-1	A	SE Middle	Concrete Piers
BF-2	A	NE Middle	" "
BF-3	A	NW Middle	" "
BF-4	B	NW	Concrete Abutments/Wingswalls
BF-5	B	NE	" "
BF-6	B	SW	" "
BF-7	C	NE	Black Abutment Joint Compound
BF-8	C	NE	" "
BF-9	C	SW	" "
BF-10	D	SE	Concrete Decking

Client Sample # (s): BF-1A - BF-33K **Total # of Samples:** 33

Relinquished (Client): **Date:** 8/17/15 **Time:** 9:00am

Received (Lab): NS **Date:** 8/19/15 **Time:** 9:25

Comments/Special Instructions:
No coatings found on any of the concrete surfaces

WPS 172453AR0795389100

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Bulk Building Material Chain of Custody

EMSL Order Number *(Lab Use Only)*

4485

Kernersville, NC 27284

PHONE: (336) 992-1025

FAX: (336) 992-4175

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	HA #	Sample Location	Material Description
BF-11	D	SW	Concrete Decking
BF-12	D	NW	" "
BF-13	E	NE	Concrete Beams
BF-14	E	SW	" "
BF-15	E	SE	" "
BF-16	F	SE	Concrete Guardrails
BF-17	F	NE	" "
BF-18	F	NW	" "
BF-19	G	SE	Concrete Sidewalks
BF-20	G	NE	" "
BF-21	G	NW	" "
BF-22	H	SE	Asphalt Overlay
BF-23	H	West Middle	" "
BF-24	H	NW	" "
BF-25	I	SE	Cementitious Deck Drains
BF-26	I	SW	" "
BF-27	I	NW	" "
BF-28	J	SW	Cementitious Utility Pipes
BF-29	J	SW	" "
BF-30	J	NW	" "
BF-31	K	NW	Gray Joint Compound
BF-32	K	East Middle	" "
BF-33	K	SE	" "
*Comments/Special Instructions: No coatings found on any of the concrete surfaces			

**EMSL Analytical, Inc.**

706 Gralin Street, Kernersville, NC 27284

Phone/Fax: (336) 992-1025 / (336) 992-4175

<http://www.EMSL.com>greensborolab@emsl.com

EMSL Order: 021504485

CustomerID: KSWA77

CustomerPO:

ProjectID:

Attn: **Kollan Spradlin**
K.S. Ware LLC
54 Lindsley Avenue
Nashville, TN 37210

Phone: (615) 742-7476
 Fax: (615) 256-5873
 Received: 08/19/15 9:25 AM
 Analysis Date: 8/20/2015
 Collected:

Project: 100-15-0048

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
BF-1 021504485-0001	Concrete Piers	Gray/Tan Non-Fibrous Heterogeneous	<1% Cellulose	10% Quartz 90% Non-fibrous (other)	None Detected
BF-2 021504485-0002	Concrete Piers	Gray/Tan Non-Fibrous Heterogeneous	<1% Cellulose	10% Quartz 90% Non-fibrous (other)	None Detected
BF-3 021504485-0003	Concrete Piers	Gray/Tan Non-Fibrous Heterogeneous	<1% Cellulose	15% Quartz 85% Non-fibrous (other)	None Detected
BF-4 021504485-0004	Concrete Abutments/Wingswalls	Brown/Gray/Tan Non-Fibrous Heterogeneous		10% Quartz 90% Non-fibrous (other)	None Detected
BF-5 021504485-0005	Concrete Abutments/Wingswalls	Brown/Gray/Tan Non-Fibrous Heterogeneous		5% Quartz 95% Non-fibrous (other)	None Detected
BF-6 021504485-0006	Concrete Abutments/Wingswalls	Gray/Tan/Green Non-Fibrous Heterogeneous	<1% Cellulose	15% Quartz 85% Non-fibrous (other)	None Detected
BF-7 021504485-0007	Black Abutment Joint Compound	Black Fibrous Heterogeneous	15% Cellulose 2% Synthetic	78% Non-fibrous (other)	5% Chrysotile
BF-8 021504485-0008	Black Abutment Joint Compound				Stop Positive (Not Analyzed)
BF-9 021504485-0009	Black Abutment Joint Compound				Stop Positive (Not Analyzed)

Analyst(s)

Nicole Shutts (20)

Scott Combs (9)

Stephen Bennett, Laboratory Manager
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. Kernersville, NC NVLAP Lab Code 102104-0, CA ELAP 2689, Virginia 3333-000228, West Virginia LT000321

Initial report from 08/21/2015 08:41:29



EMSL Analytical, Inc.

706 Gralin Street, Kernersville, NC 27284

Phone/Fax: (336) 992-1025 / (336) 992-4175

<http://www.EMSL.com>

greensborolab@emsl.com

EMSL Order:	021504485
CustomerID:	KSWA77
CustomerPO:	
ProjectID:	

Attn: **Kollan Spradlin**
K.S. Ware LLC
54 Lindsley Avenue
Nashville, TN 37210

Phone: (615) 742-7476
Fax: (615) 256-5873
Received: 08/19/15 9:25 AM
Analysis Date: 8/20/2015
Collected:

Project: 100-15-0048

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
BF-10 <i>021504485-0010</i>	Concrete Decking	Gray/Tan Non-Fibrous Heterogeneous	1% Cellulose	10% Quartz 89% Non-fibrous (other)	None Detected
BF-11 <i>021504485-0011</i>	Concrete Decking	Tan Non-Fibrous Homogeneous		15% Quartz 85% Non-fibrous (other)	None Detected
BF-12 <i>021504485-0012</i>	Concrete Decking	Gray/Tan Non-Fibrous Heterogeneous	<1% Cellulose	15% Quartz 85% Non-fibrous (other)	None Detected
BF-13 <i>021504485-0013</i>	Concrete Beams	Gray/Tan Non-Fibrous Heterogeneous		10% Quartz 90% Non-fibrous (other)	None Detected
BF-14 <i>021504485-0014</i>	Concrete Beams	Gray/Tan Non-Fibrous Heterogeneous		10% Quartz 90% Non-fibrous (other)	None Detected
BF-15 <i>021504485-0015</i>	Concrete Beams	Gray/Tan Non-Fibrous Heterogeneous	<1% Cellulose	15% Quartz 85% Non-fibrous (other)	None Detected
BF-16 <i>021504485-0016</i>	Concrete Guardrails	Gray/Tan Non-Fibrous Heterogeneous		10% Quartz 90% Non-fibrous (other)	None Detected
BF-17 <i>021504485-0017</i>	Concrete Guardrails	Gray/Tan Non-Fibrous Heterogeneous	<1% Cellulose	10% Quartz 90% Non-fibrous (other)	None Detected

Analyst(s)

Nicole Shutts (20)
Scott Combs (9)


Stephen Bennett, Laboratory Manager
or other approved signatory

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Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
BF-18 <i>021504485-0018</i>	Concrete Guardrails	Brown/Tan Non-Fibrous Heterogeneous	<1% Cellulose	15% Quartz 85% Non-fibrous (other)	None Detected
BF-19 <i>021504485-0019</i>	Concrete Sidewalks	Gray Non-Fibrous Heterogeneous	<1% Cellulose	15% Quartz 85% Non-fibrous (other)	None Detected
BF-20 <i>021504485-0020</i>	Concrete Sidewalks	Gray Non-Fibrous Heterogeneous		5% Quartz 95% Non-fibrous (other)	None Detected
BF-21 <i>021504485-0021</i>	Concrete Sidewalks	Brown/Tan/Beige Non-Fibrous Heterogeneous	<1% Cellulose	15% Quartz 85% Non-fibrous (other)	None Detected
BF-22 <i>021504485-0022</i>	Asphalt Overlay	Gray/Black Non-Fibrous Heterogeneous		10% Quartz 90% Non-fibrous (other)	None Detected
BF-23 <i>021504485-0023</i>	Asphalt Overlay	Gray Non-Fibrous Homogeneous		10% Quartz 90% Non-fibrous (other)	None Detected
BF-24 <i>021504485-0024</i>	Asphalt Overlay	Gray/Black Non-Fibrous Heterogeneous	<1% Cellulose	10% Quartz 90% Non-fibrous (other)	None Detected
BF-25 <i>021504485-0025</i>	Cementitious Deck Drains	Gray/Silver/Orange Non-Fibrous Homogeneous	2% Cellulose	98% Non-fibrous (other)	None Detected

Analyst(s) _____

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Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
BF-26 021504485-0026	Cementitious Deck Drains	Gray/Silver/Orange Non-Fibrous Homogeneous	1% Cellulose	99% Non-fibrous (other)	None Detected
BF-27 021504485-0027	Cementitious Deck Drains	Gray/Silver/Orange Non-Fibrous Heterogeneous	1% Cellulose	99% Non-fibrous (other)	None Detected
Sample Result Cannot Be Verified Due To Limited Sample Submitted.					
BF-28 021504485-0028	Cementitious Utility Pipes	Gray Fibrous Heterogeneous	5% Cellulose	75% Non-fibrous (other)	20% Chrysotile
BF-29 021504485-0029	Cementitious Utility Pipes				Stop Positive (Not Analyzed)
BF-30 021504485-0030	Cementitious Utility Pipes				Stop Positive (Not Analyzed)
BF-31 021504485-0031	Gray Joint Compound	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
BF-32 021504485-0032	Gray Joint Compound	Gray/Tan Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
BF-33 021504485-0033	Gray Joint Compound	Brown/Gray Non-Fibrous Heterogeneous	<1% Cellulose	100% Non-fibrous (other)	None Detected

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