Deconstruction Plan
FINAL

Building G-1 Deconstruction and Groundwater Investigation Cleveland, Ohio

Contract No. W912P4-07-D-0005

Prepared by:

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Buffalo District
Buffalo, New York

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Buffalo District

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Deconstruction Plan

Building G-1 Deconstruction and Groundwater Investigation Cleveland, Ohio

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- [ ] New Plan
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COMPLETION OF INDEPENDENT TECHNICAL REVIEW

ECC has completed the required work plans for the Former Harshaw Chemical Building G-1 Deconstruction and Groundwater Investigation Project, contract no. W912P4-07-D-0005. This independent technical review certification is for the project's *Building Deconstruction Plan*. Notice is hereby given that an independent technical review (ITR) has been conducted that is appropriate to the level of risk and complexity inherent in the project, as defined in the project's approved Quality Control Plan, which meet the requirements of the project's Scope of Work (section 4.1) by the USACE. During the ITR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of assumptions; methods, procedures, and material used in analyses; alternatives evaluated; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with existing USACE policy.

[redacted]

Preparer Date

[redacted]

ITR Reviewer Preparer Date

CERTIFICATION OF INDEPENDENT TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows:

Item	Technical Concerns	Possible Impact	Resolutions

As noted above, all concerns resulting from independent technical review of the plan have been resolved.

Signature/ECC Program Manager – [redacted] Date

[redacted]

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LIST OF ACRONYMS

ACM	Asbestos Containing Material
AEC	Atomic Energy Commission
APP/SSHP	Accident Prevention Plan/Site Safety and Health Plan
C&D	Construction and Demolition (usually in reference to debris)
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFC	Chlorinated Fluorocarbons
CFR	Code of Federal Regulations
CQCP	Contractor Quality Control Plan
DOT	Department of Transportation
DP	Deconstruction Plan
ECC	Environmental Chemical Corporation
FS	Feasibility Study
FUSRAP	Formerly Utilized Sites Remedial Action Program
HAZWOPER	Hazardous Waste Operations and Emergency Response
HEPA	High Efficiency Particulate Air (reference to filter or cleaning technique)
HP	Health Physicist
HTRW	Hazardous, Toxic, and Radioactive Waste
IMC	Intermodal Container
LBP	Lead Based Paint
MARC	Multiple Award Remediation Contract
mph	miles per hour
NRC	Nuclear Regulatory Commission
OAC	Ohio Administrative Code
OSHA	Occupational Safety and Health Administration
OU	Operational Unit
PCB	Polychlorinated Biphenyl
PEL	Permissible Exposure Level
PLM	Polarized Light Microscopy
PM	Project Manager
poly	polyethylene (common name for plastic sheeting material)
PPE	Personal Protective Equipment
QCS	Quality Control System

LIST OF ACRONYMS CONTINUED

RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
SAP	Sampling and Analysis Plan
SOP	Site Operations Plan
SOW	Scope of Work
TEM	Transmission Electron Microscopy
TSCA	Toxic Substances Control Act
USACE	United States Army Corps of Engineers
UF_x	Uranium Fluoride (chemical compound acronym)
UO_x	Uranium Oxide (chemical compound acronym)
WMTDP	Waste Management, Transportation, and Disposal Plan
yd^3	cubic yard

1.0 INTRODUCTION

This document outlines the intended sequence of work and pertinent details for the execution of the deconstruction of Building G-1 at The Former Harshaw Chemical Company Site. Project Work is performed by ECC under the US Army Corps of Engineers' (USACE) Multiple Award Remediation Contract (MARC), contract number W912P4-07-D-0005. The project title is: Building G-1 Deconstruction and Groundwater Investigation. This document is intended to satisfy the work plan requirement for a Building Deconstruction Plan (DP) under the MARC contract's requirements and scope of work (SOW) (USACE, 2014).

This DP makes heavy reference to the other work plans required by the contract, as they contain their respective technical details for that aspect of the project's execution. These other required work plans are:

- (ECC, 2014a) *Accident Prevention Plan/Site Safety and Health Plan* (APP/SSHP) – This plan is intended to examine and prescribe procedures, protective equipment, protective monitoring, and project controls related to the human health and safety of workers on site and the surrounding community. Particularly, it addresses the hazards posed by the dilapidated structure, the site activities, and the potential risks posed by areas that are possibly contaminated with Hazardous, Toxic, and Radiological Wastes (HTRW). The SSHP also includes an Emergency Response and Notification Plan for potential spills/releases (chemical and radiological) for on-site activities and off-site transportation.
- (ECC, 2014b) *Contractor Quality Control Plan* (CQCP) – This work plan contains the technical management plan for executing the project on time and within budget, while detailing the procedures taken to meet the quality objectives pertaining to each definable feature of the work. The CQCP provides procedures to assure that work activities comply with the SOW, this SOP, supporting project work plans, and all applicable federal, state, and local requirements. The plan includes the project's official resource organization, and the responsibilities and authorities of the personnel, and lines of communication between the client and contractor, and how the required submittals will be delivered to the USACE via their Contractor Quality Control System (QCS). (ECC, 2014c) *Site Operations Plan* (SOP) – This work plan describes the day-to-day operations and general outline of the features of work required by the project.
- (ECC, 2014d) *Sampling and Analysis Plan* (SAP) – This work plan details the sampling and analysis procedures for the environmental investigation, HTRW survey, and characterization of the building materials and project associated environmental media (such as the site's soil, air, and groundwater). The purpose of sampling is to ensure the safety of project personnel and the public as well. The SAP details the required quality control procedures in both the field work and the analytical laboratory that will meet the data quality objectives set forth in the CQCP and other applicable guidance documents.
- (ECC, 2014e) *Waste Management, Transportation, and Disposal Plan* (WMTDP) – This work plan contains the technical details for the characterization, segregation, packaging, transportation and disposal of the wastes generated during the performance of deconstruction activities, and groundwater investigation at a properly licensed/permitted disposal facility.

Building G-1 on the Harshaw property is one building with several additions constructed from 1940 to 1948 located in Cleveland, Ohio. This work plan's deconstruction (as opposed to demolition) SOW, is intended to safely dismantle the building, removing all building materials down to the building slab, while taking measures to prevent the spread of the potential contamination within the environment or outside of the property.

Work will comply with all applicable federal, state, and local laws and regulations. This project comprises of a removal action for the deconstruction of Building G-1 and other related environmental cleanup activities via the USACE Formerly Utilized Sites Remedial Action Program (FUSRAP). FUSRAP sites are subject to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations [CFR] 300). The actions described in this DP are intended to be congruent with the USACE response actions to the contaminant concerns and hazards of this site.

1.1 SITE BACKGROUND

The Former Harshaw Chemical Company Site produced a number of major and minor uranium products in various forms under contract. Historic accounts describe five thousand metric tons of uranium were processed between 1942 and 1954. Major products included uranium tetrafluoride (UF_4) (Green Salt), Uranium hexafluoride (UF_6), and uranium trioxide (UO_3). The major processing plants located within Building G-1 were the Refinery and Brown Oxide Plant, which produced UO_3 and uranium dioxide (UO_2), respectively. Also located in Building G-1 were the UF_4 plant and the UF_6 plant. Plant activities were confined to the currently fenced area around Building G-1, and included the use of the former rail yard adjacent to Building G-1. Site investigations also discovered surface contamination in the former Foundry (previously designated as Building F-1), Garage, and Warehouse buildings, shown in **Figure 1-1**. However these buildings are not covered in this scope of work.

These operations were carried out within the Building G-1 complex, which was built and expanded several times over the period from 1940-1948. The Building G-1 complex lies within a 1.6-acre fenced area located in the northern portion of the Former Harshaw Chemical Company Site, as shown in Figure 1-1. This area in the vicinity of the uranium operations was designated as Operational Unit -1 (OU-1), and investigated accordingly.

The site is located at 1000 Harvard Avenue in Cleveland, Ohio. The site is surrounded by industrial operations and residential areas. The site is located adjacent to the Cuyahoga River and Big Creek within an industrialized area in Cuyahoga County. Neighboring industries include Mittal Steel, Aluminum Company of America, Chemical Solvents, Inc., and CSP Fabricating. The site consists of approximately 55 acres and includes several developed and undeveloped land parcels located near the intersection of Harvard Avenue and Jennings Road. Developed site parcels include former production areas and remaining facility buildings, former production area foundations, parking areas associated with previously dismantled buildings, and re-developed, privately-owned commercial properties.

Respective Remedial Investigations (RI) and Feasibility Study (FS), provides additional background information, and technical details of the known site conditions of OU-1 (USACE 2009 & 2012). The estimated volume of building materials, debris and wastes associated with the dismantling of Building G-1 as estimated in associated FS documents is 5,675 cubic yards (yd^3).

2.0 SEQUENCE OF OPERATIONS

This plan provides an overall strategy for both the HTRW abatement and deconstruction activities. Work will be sequenced in a safe and efficient manner. The general sequence of work in this DP includes:

2.1 PRE-DECONSTRUCTION ACTIVITIES INCLUDING:

- Utility abandonment procedures
- Completion of Structural Engineering Survey (**Attachment A**)
- Identification of potential hazardous materials including planned removal procedures, including precautions to be taken associated with bird/animal waste, potential asbestos containing material (ACM), polychlorinated biphenyl (PCB) containing paint, and lead-based paint (LBP) and contaminated surfaces
- Identification of on-site competent person as well as level of authority established
- Development of drawings and calculations to substantiate work procedures, including temporary supports required to avoid catastrophic collapse of building
- Fire safety procedures
- Debris Removal

2.2 DETAILED DESCRIPTION OF DECONSTRUCTION PROCESS

- Measures to protect existing structures, facilities, utilities etc.
- Deconstruction sequence
    - Isolation of Utilities
    - Abatement of HTRW
    - Deconstruction of low rise building additions
    - Deconstruction of high rise building sections

2.3 CONTROL MEASURES

- Entry and Exit Procedures
- Decontamination facilities
- Engineering Controls
- Radiological
- Dust Control
- Surface water runoff control methods

Control measures are intended to be implemented throughout the project's sequence of activities to assure safety and quality of work.

3.0 SITE MOBILIZATION

A pre-deconstruction inspection will be conducted to gather photographic documentation of the existing site conditions prior to commencement of any on-site work.

Site mobilization will begin only after all pre-mobilization planning and submittals have been reviewed and approved by USACE. Once complete, ECC will perform a preliminary job site turnover walk-through with USACE to adequately understand the site's current configuration. Adequate time and manpower has been allotted in the schedule for the preparation of the pre-mobilization submittals and to perform the job site turnover.

3.1 EQUIPMENT

The anticipated mobilization will include the following major equipment for the Building G-1 deconstruction:

- 1-Caterpillar ® 345 Excavator with Shear and Pulverizer Attachments
- 1-Caterpillar ® 325 with Grapple, Hammer, and Shear Attachments
- 1-Komatsu ® PC300 Excavator with Grapple, and Shear Attachments
- JLG ® 120' Man lift
- 783 Bobcat ®
- Scissor Lift
- Conex ® Box (or equivalent) for storage
- Hot Work supplies
- Dust Control Equipment
- Rigging Equipment
- Temporary lighting
- Hepa Filtered Negative Air Machines
- Hepa-Filtered Vacuums
- Decontamination Trailer
- Aquahog 5 micron water filtration unit
- Holding tank for the collection of water to be sampled (if required)

Project equipment may not be limited to this list depending on site and project conditions. All equipment mobilization notifications will be made well in advance of the estimated arrival date to allow adequate time for USACE personnel to inspect the condition of each unit to be used. Heavy equipment delivery will be closely coordinated with USACE to limit if not completely alleviate any impacts to USACE's ongoing site activities. The excavators will require assembly onsite, and will be assembled in accordance with manufacturer's specifications. Once assembled, the machines will be inspected and tested to ensure that they are in safe working condition and that all safety apparatus' are in place and functioning as designed.

3.2 PERSONNEL

The following trained and qualified personnel are anticipated to be mobilized to the Building G-1 project site to perform the work. These personnel listed are in addition to the ECC project management and support personnel listed in the SOP (ECC, 2014c). All site personnel will have Radiation Protection Training meeting 10 CFR Parts 19 and 20 requirements and 40-hour Occupation Safety and Health Administration's (OSHA) Hazardous Waste Operations and

Emergency Response (HAZWOPER) worker training. All workers will have passed HAZWOPER physicals prior to reporting for work. Personnel include:

Project Oversight:

1 - Operations Superintendent
1 - Site Safety and Health Manager (ECC SSHO)

Building Deconstruction and Disposal Team:

1 - Labor Foremen
5 - Laborers
3 - Operators

Hazard Mitigation and Abatement Team:

1 - Supervisor
8 - Laborers

Personnel quantity and trades may not be limited to this list depending on site and project conditions as work proceeds. Any changes will be communicated to USACE within 48 hours.

The sequencing of pre-deconstruction activities and subsequent structural deconstruction of Building G-1 and ancillary systems will be in accordance with the agreed-upon project schedule. Two distinct teams, the Hazard Mitigation and Abatement Team and Building Deconstruction and Disposal Team, will be utilized to accomplish the overall work scope in a safe, systematic, and efficient progression. Both will be directed by the project's on-site management group. The hazard mitigation team will be comprised of experienced and properly trained technicians. All members will possess required local, state, and federal work related credentials.

The Hazard Mitigation and Abatement Team will complete the abatement of identified universal wastes and asbestos containing materials. A State of Ohio certified and licensed third party asbestos abatement consultant will oversee all abatement activities. Abatement techniques and packaging procedures will comply with all applicable State and Federal regulatory requirements, and all required notifications will be submitted prior to commencement of activities. Abatement will be a predecessor activity to subsequent Building Deconstruction and Disposal Team activities. Completing the abatement prior to Building Deconstruction and Disposal Team will eliminate the possibility of potential worker exposure and cross-contamination.

The Building Deconstruction and Disposal Team will be made up of an integrated group of laborers, equipment operators, and foremen. All members will have extensive training and experience in the safe and efficient deconstruction of buildings. The core group of this team will consist of full time employees that are familiar with working on and managing large deconstruction projects and have extensive radioactive decontamination, deconstruction, and demolition experience. They are aware of the unique challenges of performing deconstruction activities near remaining structures and operating facilities.

4.0 PRE-DECONSTRUCTION ACTIVITIES

This section describes the necessary measures prior to activities that will dismantle the building and site during deconstruction activities. These are designed to ensure worker safety, prevent the spread of contamination and prevent property damage/loss.

4.1 UTILITY ABANDONMENT

A survey will be performed to locate all underground utility lines within the work perimeter prior to the start of deconstruction to verify that all utilities to Building G-1 have been terminated. This includes the plugging of all drain lines by filling the drain holes to grade with gravel and concrete. . Liquids and solids from the building's drains and sumps will be removed prior to plugging to prevent overflow prior and during drain plugging. Any material removed from drains and sumps shall be segregated and sampled. This material should not be mixed with other waste streams until its waste characteristics have been determined (refer to the WMTDP ECC, 2014e). Plugging of these drains effectively prevents any waters (such as contact water from precipitation, or dust control spray) from migrating off-site via the site's sewers.

Isolation of Building G-1 utilities will be performed/verified as required or as site conditions dictate. The project will utilize Dig Safe of Ohio prior to start of deconstruction for stakeout requests. During the execution of the work activities on site, all utilities identified will remain clearly marked with the marking protected to remain visible.

If located and not terminated, the underground utility lines (gas, electric, water, sewer, telephone, etc.) will be shown on a drawing that will be presented to the USACE. Upon USACE acceptance, project staff will disconnect and properly terminate all existing utility lines as required for building deconstruction.

4.2 BUILDING G-1 STRUCTURAL INTEGRITY EVALUATION

A professional structural engineer, licensed in Ohio, has evaluated the structural integrity of Building G-1in accordance with:

- SEI/ASCE 11-99 Guideline for Structural Assessment of Existing Buildings.
- ANSI A10.6 – Safety Requirements for Demolition Operations,
- 29 CFR 1926.850- Safety and Health Regulations for Construction, Preparatory Operations.

The structural integrity evaluation includes the current condition of the building and the recommended approach/sequencing for building deconstruction as well as measures to be taken to prevent inadvertent/unplanned collapse.

A report detailing the results and recommendations identified in the evaluation is included as an attachment to this document (**Attachment A**) with prior comments addressed. The Licensed Ohio State Professional Engineer will stamp and sign the referenced report.

Agreement from the USACE, professional engineer, and the contractor will be needed to finalize the measures needed to maintain safety and structural integrity of the site during deconstruction activities. These will be implemented prior to the start of any deconstruction activities that may threaten structural integrity.

4.3 HAZARDOUS MATERIALS IDENTIFICATION AND CHARACTERIZATION

Characterization, through the use of sampling, analysis, radiological surveys and historical knowledge will be conducted as outlined in the Sample and Analysis Plan (ECC, 2014d) to identify radiological and hazardous conditions that will be encountered during the project activities.

Prior to the start of deconstruction activities, project staff will identify and quantify potentially hazardous materials including but not limited to: lead, light ballasts, window-caulk containing PCBs, fluorescent light fixtures, mercury/sodium vapor lights, capacitors, thermostats, ACM and bird/animal wastes. Once identified, these wastes will be removed or stabilized (e.g. animal/bird waste) and will be segregated and packaged separately from other building debris (if required). The removed materials will be characterized using process knowledge and a detailed survey to determine if the materials are radioactively contaminated. If detectable levels of radioactivity are present, ECC may perform some decontamination of items in order to minimize the generation of potentially regulated waste.

Based on the building history, painted surface coatings may contain lead or PCBs. However, based on previous investigations in the RI/FS phase, these coatings may exist on site, but the concentrations and quantities of lead and PCBs are at unregulated levels (see **section 4.6.1** below). Waste characterization of the generated project wastes (such as debris from deconstruction) will be conducted to ensure that handling and disposition occurs in accordance with all applicable laws, rules, and regulations.

4.4 PRE-DECONSTRUCTION ACM SURVEY

A pre-deconstruction asbestos survey was performed by an Ohio State certified and licensed asbestos inspector on both the interior and exterior of the building, as part of the HTRW survey. The objective of this inspection was to evaluate, correlate, and quantify all asbestos containing materials and provide guidance for removal prior to the Building G-1 deconstruction. This report is included as Attachment B. Both hazardous and radiological controls will be established prior to the start of the survey. The APP/SSHP (ECC, 2014a) will contain the developed measures and hazard analyses for the abatement tasks.

Suspect materials used in the construction of the building such as floor, wall, and ceiling materials, surfacing materials, thermal systems insulation, roofing, caulks, and miscellaneous materials will be sampled. The inspector will select materials for inclusion in this report through their expertise and thorough understanding of the historical uses of asbestos. Samples will be collected from locations and recorded on a chain of custody document, recorded on a drawing, and individually retained within a container and transported to the analytical laboratory for analysis. All materials sampled will be analyzed by Polarized Light Microscopy (PLM) and Transmission Electron Microscopy (TEM). Any materials will be considered as asbestos containing material (ACM) if one or more layers contain asbestos concentrations greater than 1 percent.

4.5 ASBESTOS ABATEMENT

Removal will be in accordance with site, local, state, and federal regulatory agency guidelines. All abatement workers will have completed required training and will possess required credentials and certifications. Asbestos Warning tape will be positioned to establish a controlled area, and to prevent accidental entry into the work zone. Polyethylene (Poly) sheeting

will be positioned under and adjacent to areas where removal is occurring. Aerial lifts will be utilized to provide worker access to the abatement areas (if required). Appropriate fall protection and PPE will be used for all abatement work activities.

All individuals who enter the Work Area shall legibly sign the entry/exit log located in the clean room upon each entry and exit. The log shall be permanently bound and shall identify fully:

- the facility as "Building G-1, Former Harshaw Chemical Company Site",
- the personnel's full name and employer,
- the project title as the "Abatement and Deconstruction of Building G-1",
- each work area visited, and
- worker respiratory protection employed.

The job supervisor shall be responsible for the maintenance of the log during the abatement activity.

Required personnel and area air sampling will be administered until a negative exposure assessment has been established and warrants the elimination of area air sampling. All air samples will be analyzed by approved methods and/or personnel to determine the protectiveness of the project's engineering controls and personal protective equipment.

A remote decontamination facility shall be used for the project, and entry and exit requirements shall be determined by the appropriate licensed asbestos professional. Typical procedures include (but are not limited to):

- Each worker shall remove street clothes in the clean room and don two disposable suits, including gloves, hoods and non-skid footwear, and put on a clean respirator with new filters before entering the work area.
- Each worker shall, before leaving the work area, clean the outside of the respirators and outer protective clothing by wet cleaning and/or High Efficiency Particulate Air (HEPA) vacuuming. The outer disposable suit shall be removed in the work area and placed in a labeled ACM 6 mil thick, polyethylene (poly) disposal bag. The worker shall then proceed into the decontamination facility. The inner disposable suit shall be wet wiped and HEPA vacuumed thoroughly before removing and prior to an aggressive shower. The respirator shall be removed and rinsed in the shower.
- Following showering and drying off, each worker or authorized visitor shall proceed directly to the clean room, dress in street clothes and exit the decontamination enclosure system immediately. Personnel will sign the log book to document egress from the regulated area.

Based on the dates of construction and operations at Building G-1, the cement roofing panels are suspected to contain asbestos, but are classified as non-friable if analysis confirms their asbestos content qualifying them as ACM. If considered non friable ACM, they may be handled with a minimum of breakage and disposed of as construction debris in landfill that accepts asbestos wastes (per Ohio Administrative Code (OAC) 3745-20-01). The selected landfill for the project, US Ecology Idaho, accepts this type of construction debris.

Previous investigations have sampled for asbestos at Building G-1, as part of the RI/FS process. The only roof area that was found to contain asbestos in sufficient quantities to qualify as non-friable ACM was the section of roof in the one-story area built in 1944. The remaining sections

of Building G-1's roofing panels are not considered ACM. Therefore, there will be no abatement of the roofing material necessary prior to the start of deconstruction activities. The known ACM roof panel area will be deconstructed in a minimally destructive manner prior to the deconstruction of other areas, and consistent with the applicable laws, rules and regulations. The resulting debris will be live-loaded into IMCs for disposal as deconstruction debris (refer to the WMTDP ECC, 2014e). The remaining roofing will be deconstructed as described in **Section 6.1** of this work plan.

4.6 HAZARDOUS MATERIAL IDENTIFICATION AND REMOVAL

During the abatement phase of the project, the Project Team will concurrently collect all batteries, fluorescent bulbs, high intensity lighting, related PCB containing caulk, ballasts and capacitors, mercury containing devices, smoke detectors and miscellaneous chemicals from the structure. All HTRW will be disposed of in accordance with all applicable laws and regulations and ECC's approved WMTDP (ECC, 2014e).

Per the project's plans, general deconstruction debris will be live-loaded into appropriate intermodal containers (IMCs) onsite and transported by truck to a local rail-yard for loading onto railcars and shipment to the final disposal facility. The IMCs will have a solid lid and each load will be accompanied by the proper shipping paperwork. If staging of the deconstruction and abatement waste is necessary, an appropriately lined area within the 15-meter buffer zone outside of the building foot-print will be used.

The IMCs are designed to prevent the migration or spill of particulates and debris from the solid wastes during transportation and will be appropriately placarded (if required) and transported in accordance with DOT requirements.

All solid wastes (deconstruction waste) derived from the project will be managed as low-activity radioactive waste (LARW) and disposed in a Subtitle C landfill (U.S. Ecology in Grand View, Idaho). Radiological surveys by Health Physicists will ensure that radioactivity levels of the disposed wastes meet the criteria for classification as LARW. Additionally, waste characterization sampling will ensure that the proper waste handling and disposal are used throughout the execution of the project. It is anticipated that special segregation efforts based on characterization results will not be necessary for waste disposal purposes.

Guidance has proposed criteria for the classification of LARW as not exceeding 0.05 percent Uranium or Thorium, which are classified as non-source material under 10 CFR 20.1003, and may be disposed of at a Subtitle C facility. Waste exceeding this criteria are source materials, classified as low-level radioactive wastes (LLRW), and must be disposed of in a landfill or disposal facility meeting the requirements of the NRC regulations 10 CFR 61.

Pre-deconstruction abatement and removal of HTRW is anticipated to prevent the generation of mixed-wastes, where LARW or LLRW is comingled with hazardous waste. If surveys and characterization results indicate that regulated wastes have been generated, these will be handled in accordance with applicable laws, rules and regulations, and disposed of at properly licensed/permitted disposal facility (see SOP and WMTDP, ECC 2014c and 2014e). Examples of HTRW removal and handling include but are not limited to:

- Florescent light tubes will be removed from the overhead fixtures by hand. Light tubes shall be removed intact and placed into shipping containers as they are removed. Light

tubes will not be allowed to accumulate un-containerized in the work area. The use of a scissor lift and/or ladder will be necessary to facilitate the removal of the light tubes.

- After the light tubes have been removed from the fixtures, the ballast labels will be checked. Any ballast that does not specifically state that it is "PCB Free" will be removed and disposed of as PCB waste.
- Mercury containing switches will be carefully removed so as not to rupture the mercury vial. This will be accomplished utilizing hand tools, if the vial cannot be easily removed, then the entire fixture will be removed. The mercury vials and/or switches will be wrapped in cushioning material and placed in an appropriate container for disposal.
- All chlorinated fluorocarbons (CFCs) will be removed from the building's air condition system prior to deconstruction. A CFC recycling machine will remove all CFCs within the system. A collection hose will be connected to the access port of the AC system, and all CFC within the system will be evacuated by the machine and placed in a separate pressurized container.
- Animal material is present throughout the building. There are two different types of animal material present, animal carcasses and animal feces. Animal carcasses will be sprayed with a bleach based neutralizing agent and collected via shovel and disposed of as municipal waste. Animal feces will be neutralized with a bleach based agent and left in place.

4.6.1 PCB Containing and Lead Based Paint (LBP)

The Project Team is aware that some or all of the existing paint on structural steel, flooring, remnant process components, and other building components, might contain dangerous levels of lead or toxic levels PCBs in their paint coverings. It is not anticipated that these potentially hazardous paints will require removal prior to deconstruction, and if present on site, they exist at unregulated levels. Procedures for OSHA safety in construction (29 CFR 1926) allow for handling of wastes, if the paint coverings are in good and intact condition.

Work activities with the potential for lead and PCB exposures shall be conducted in accordance with the approved procedures in the APP/SSHP (ECC, 2014a) and applicable laws and regulations. These procedures are developed with the intention of assuring worker and community safety. For example, where hot work cutting techniques will be used on material with LBP potentially creating dangerous fumes, LBP will be abated or engineering controls will be implemented prior to any cutting. Appropriate personal and site surveillance and monitoring measures will be implemented as necessary when a work activity risks exposure or the spread of contamination from these paint coverings.

Prior to the transportation and disposal of wastes, the wastes will be characterized such that they meet the acceptance criteria for the receiving disposal facility. The waste characterization will ensure that the wastes generated do not violate Resource Conservation and Recovery Act (RCRA) hazardous waste characteristics (40 CFR 261) or the Toxic Substances Control Act (TSCA) as applicable to PCBs (40 CFR 761).

4.7 Radiological Contamination Surveys

Building G-1 has a high potential to contain areas with radiological contamination. The health physicist (HP) will conduct a radiological contamination survey and determine if the site conditions are appropriate for workers to proceed with the deconstruction safely. The surfaces

within the building may require decontamination by approved personnel and procedures prior to the start of deconstruction activities in order to ensure that work will proceed using sufficient measures for worker safety. Additional details on the management of radioactive contamination can be found in the APP/SSHP for the project (ECC, 2014a)

The pre-deconstruction survey will also mark portions of the radioactively contaminated floor slab that will require potential remediation of the removable radiological component in order to meet unrestricted release (Nuclear Regulatory Commission [NRC] Regulatory Guide 1.86 criteria; NRC, 1974).

A 15-meter buffer zone around the building will also be surveyed. Soil areas adjacent to Building G-1 (within 15 meters) with elevated radiological levels will be covered with a USACE approved cover. Typically areas are covered with geotextile fabric and crushed stone in order to minimize disturbance during deconstruction activities. Areas of elevated radiological contamination areas will be delineated with fencing to keep unauthorized personnel and equipment away.

Equipment brought onto the project will be both operationally inspected and radiologically surveyed prior to use and prior to entering the radiological work area. All equipment will be inspected on a daily basis and at frequencies identified per the manufacturer specifications, and maintained in a safe operating condition. Only approved project workers or designated sub-tier contractors (who have been trained and are qualified by their employer) will operate heavy equipment or trucks.

5.0 OTHER PROJECT CONTROLS AND CONSIDERATIONS FOR BUILDING DECONSTRUCTION

This section describes considerations that are necessary for the successful and safe execution of the deconstruction work. These are intended to be implemented as part of the deconstruction activities, which may include preparation work, just prior to the physical dismantling of building systems.

5.1 PREMATURE COLLAPSE / COMPETENT PERSON.

This section's engineering and administrative controls are identified to prevent any potential for unintended premature collapse of the structure.

The pre-deconstruction structural engineer survey (**Attachment A**) will be completed to ensure that measures will be taken to prevent premature collapse during project activities. No personnel will be permitted inside the building in areas once active deconstruction is proceeding (refer to **Section 6.0**). All processing, packaging, and loading of wastes and debris will be completed with excavators, from outside the building's footprint during deconstruction, working from the outside-in, such that no workers will be potentially exposed to the hazards of building collapse. No workers will be allowed within the building footprint during active deconstruction activities. All solid wastes will be loaded into IMCs, and workers will only be present in the IMC loading areas (i.e. opening IMCs, lining them, and closing them) when it is safe to do so as determined by on-site safety personnel (refer to the SAPP/SHP, ECC, 2014a). Once deconstruction proceeds, the threat to workers from the hazard of premature building collapse will not be present.

Routine inspection of the site by the Contractor's on-site Competent Person (as defined in 29 CFR 1926.32(f)) will ensure the safety of workers by identifying potential scenarios for premature collapse. If such cases occur, the project work related to, or affected by the potential pre-mature collapse of Building G-1 will halt, until assistance from the Structural Engineer (i.e., change of predicted events creating potential hazardous condition that were not expected) has determined the appropriate measures and procedures to undertake to ensure worker safety. Such occurrences will be documented by the competent person, incorporated into the daily logs and reports (refer to the SOP, ECC, 2014c), and communicated to the USACE within 24 hours of the stopped-work.

Should workers require access to the building footprint area prior to the completion of the building's deconstruction, active deconstruction will cease and an on-site competent person will certify that the area is safe to enter.

5.2 FIRE SAFETY PROCEDURES / PREVENTION

To reduce the risk of fire, employees will implement the following fire prevention requirements. Fire prevention will be achieved by:

- Maintaining good housekeeping, removing combustible materials routinely
- Locating combustible storage piles away from ignition sources
- Minimizing the storage of fuels and lubricants on site.
- Locating internal combustion engine exhausts away from combustible materials and air intakes
- Allowing combustion engine equipment, such as generators to cool prior to refueling

Fire extinguishers will be available at the work site and stationed on all heavy equipment, whether driven or not. Personnel will be familiarized with the location of extinguishers prior to working in the area, and receive awareness training including the different classes of fires and the use of portable fire extinguishers. Fire safety considerations are detailed in the APP/SSHP (ECC, 2014a).

5.3 WORK AREA INGRESS/EGRESS

Entrance requirements will be specific to the work area and task being performed. Individual areas will be posted to warn individuals (both project personnel and public) of potential hazards. Entry controls will be put into place and reinforced using specific training for access to the project areas. Requirements for entry will be commensurate with potential hazards of that phase of work. In case of emergency within the project area, all project personnel shall evacuate the work area to an assembly point adjacent to the worksite job trailer.

5.4 SEVERE WEATHER STOPPAGE CONSIDERATION

Elevated removal work shall be suspended during sustained winds of 30 miles per hour or during periods of lightning. In the event of tornado or severe thunderstorm warnings or the threat of other severe weather conditions, those tasks necessary to stabilize the work site shall be immediately performed and personnel will proceed to shelter. If lightning is within 5 miles of the job site, outside work will stop immediately and workers will return to the site office trailer until the weather front has been evaluated by Site Safety Representative. At all times, the Site supervisor has the ability to suspend work due to severe weather and when adverse conditions are imminent, the Site Supervisor in conjunction with both the Safety Representative and Site Manager shall review local weather conditions.

5.5 SITE WATER MANAGEMENT

The Project Team will minimize the potential spread of radiological and other contamination during Building G-1 deconstruction by implementing water diversion as well as wastewater collection and management. Water diversion measures will consist of limiting areas where work with potentially contaminated debris occurs, implementing sedimentation and erosion control measures, and placing waste/debris on top of polyethylene plastic. In addition, all waste/debris piles will be covered to prevent the generation of contaminated runoff.

A number of measures will be employed to minimize the potential of rainwater contacting the contaminated surfaces of the building. These measures shall include the use of poly covers and temporary downspouts to avoid generating large quantities of wastewater. Erosion and sediment control measures will also be designed and implemented along with the project waste water collection systems, to minimize the impact runoff has on the project site and the generation of wastes (see below).

All wastewater (e.g. contact water or water generated during project activities such as dust control) will be collected and containerized (as required) during the deconstruction of the building. Items to be used for collection and storage include (but are not limited to) polyethylene tanks, a pump powered by a gasoline fueled electric generator, hose and support equipment. These components make up the wastewater collection system.

The collected wastewater will be conveyed to a temporary on-site wastewater storage container (i.e. a poly storage tank). Depending on the encountered levels of solids or sludge, on-site treatment may include (but are not limited to) bag filtration and/or settling and decanting.

Wastewater will be stored until waste characterization has determined the appropriateness for disposal, or further onsite treatment. The contents will be transported to an appropriate public or commercial treatment works, acceptable to the USACE. Water will also be surveyed for radiological contamination, ensuring that appropriate disposal criteria have been met.

Additional details pertaining to the management of wastewater are contained in the WMTDP (ECC, 2014e).

5.5.1 Surface Water/Run-off/Pollution Prevention

The use of good construction management techniques will be used to control storm water from carrying soils or vegetation into nearby creeks or waterways. ECC will implement controls to contain all run-off water that comes in contact with building debris, waste stockpiles or potentially contaminated material.

In addition to controls put in place to maintain run-off from the work area, if ground area outside the building footprint has the potential to be disturbed, measures such as silt fences, and/or straw bales will be used to interrupt the down-gradient flow of storm water, reducing or eliminating the deposition of silt in waterways. Regular inspections of these control measures, particularly prior to and after significant storm events, will be made and repairs initiated as needed. Additional considerations will be investigated for sheet flow runoff and seasonal deposits of suspended water.

Deconstruction of the facilities and other soil disturbances will expose the site to contact with storm water runoff. Best Management Practices for installing and maintaining controls during site work will be implemented and until re-vegetation provides adequate cover to prevent erosion. Regular inspections will be conducted and corrective actions taken to limit runoff. Water collected on the building slab will be handled per the measures described in **Section 5.5** and in the WMTDP (ECC, 2014e).

5.6 Dust Control Methods

Dust control measures will be implemented during deconstruction to prevent spread of contamination as well as maintaining the particulate level at the permissible exposure level (PEL) specified in 29 CFR 1926.55. The dust control program will consist of both dust suppression measures and ambient air monitoring to verify the effectiveness of dust suppression. Dust controls to be implemented during the project are summarized below.

Conventional methods will be used to suppress dust generated during deconstruction, including:

- Wetting deconstruction equipment and active deconstruction areas as required
- Covering waste/debris piles
- Hauling wastes/debris leaving the site in closed containers
- Site speed limit is 10 miles per hour
- Applying a water spray during waste/debris handling and to unpaved vehicle access routes at the site, as required.

A spray nozzle and pump system will be used to suppress fugitive dust while preventing overly wet conditions, avoiding ponding and runoff, and conserving water. Water for dust suppression will be obtained from the available on-site water sources (whether imported, or connected to utilities). Reuse of site generated and collected wastewater may also be used, given waste characteristics appropriate for re-use on the site, and would not cause unacceptable worker

exposure or spread of contamination. The SSHO and HP will certify that reused water will not exceed standards for worker occupational exposure to hazardous substances (per 29 CFR 1926 subpart Z) and radiological exposure (per 10 CFR 20). All waste water generated from dust suppression will be captured and collected per the WMTDP (ECC, 2014e) and measures proposed in **Section 5.5**, preventing contaminant migration off site. Re-used water will not be sprayed in windy conditions (see below).

Project activities that could potentially cause the release of dust, such as building deconstruction, waste/debris piles, loading wastes/debris, transport of waste/debris, will be monitored for dust particulates and radioactivity in accordance with procedures described in the APP for the project (ECC, 2014a). During windy conditions, where wind is projected to be in excess of 12 miles per hour (mph), the effectiveness of misting for emission control will be evaluated hourly. Dust generating work activities will cease if dust control measures are found not to be effective.

5.7 RADIOLOGICAL CONTAMINATION CONTROLS

Radiological contamination may be contained in areas unseen as they lie in spaces between building materials, structures, and within ducting/piping. As deconstruction proceeds, the waste generated will be surveyed by the HP teams to ensure that no release of radiological contamination has occurred. Dust suppression and dust monitoring will provide additional controls to prevent radiological contamination from inadvertently spreading during activities that uncover areas that could not be accessed during the pre-deconstruction radiological surveys.

Should the HP team discover that wastes exceed criteria for LARW during site activities that uncover radiological contamination (such as caked UF_x and UO_x dusts), the waste will be segregated for disposal at a properly licensed/permitted disposal facility (refer to the WMTDP, ECC, 2014e).

6.0 DECONSTRUCTION ACTIVITIES

The Project Team will complete the deconstruction of Building G-1. The concrete floor slab and footings will remain. The project team will remediate concrete surfaces (if necessary) that are radioactively contaminated in excess of levels above unrestricted release criteria for removable contamination (NRC Regulatory Guide 1.86). The schedule for the project is presented in the QCP (ECC, 2014b).

Prior to the deconstruction of the major building components of the structure, the windows and other glass structures will be removed and disposed of, per the SOW (USACE, 2014).

6.1 STRUCTURE DISMANTLING SUMMARY

Dismantling of the Building G-1 structure will begin with the removal of the low rise (one-story) portion of the facility attached to the sections of the facility with more floors (two and three-story). Sequence of building deconstruction will generally proceed from the west to the east. This removal action (low rise sections of the structure) will be performed by a Komatsu PC 300 (or equivalent hydraulic excavator) with shear attachment. The shear attachment will be a hybrid-type (both concrete and steel demolition shear) that can shear building envelope materials and masonry to access and successfully cut the steel building members without a time consuming change out of the tool. Shear tools may also be controlled to grip and move materials as well. Each section of the building will be deconstructed from the top-down, starting with the removal of the roofing system components and ending at the building slab.

Generally, the low rise additions will be removed first and size reduced from within the footprint of the facilities where possible. See **Figure 6-1** for the general layout of the building complex. The western 1944 and 1945 (the years built) sections of the building are one story tall. The 1940 section and its attached 1944 section are two-stories tall. The 1948 portion of the Building G-1 complex is 3-stories tall, and is expected to deconstructed last.

Deconstruction will proceed in sections, determined by the configuration of that section's walls, typically delineated by the facility's former bay door openings. The hydraulic excavator operator working under the direct supervision of the Building Deconstruction Team's onsite superintendent will proceed from section to section, ensuring the controlled deconstruction of the building components, and live-loading of the generated debris from each section from the top-down. All debris generated from the deconstruction activities will be live-loaded into IMCs. If the size of the waste pieces require it, the debris will be directed onto the building slab for segregation, size reduction and live-load out into the IMCs. This procedure minimizes the risk of debris escaping the footprint of the building.

Generally the top-down sequence will proceed as follows:

- The roofing tiles and associated sub-roof materials are removed via the gripping action of the excavator shear attachment.
- Then the excavator will shear the roof trusses attached to the main structure, cutting away the masonry for access if necessary.
- The operator will then shear the roof truss on the opposite end located along the building perimeter and lower the removed beam to grade.

- Once removed from place the trusses and debris generated will be allowed to accumulate on the building slab.
- Horizontal beams will then be removed via shear followed by vertical columns which will be bent over and sheared at the bottom.

Deconstruction of the high rise section (two-to-three story sections, depending on the site conditions) of Building G-1 will be accomplished by the Cat 345 (or equivalent excavator, with the ability to access and deconstruct the third story heights) with shear attachment, proceeding top-down as described above. In general, the upper portions of Building G-1 will be dismantled bay by bay in a fully controlled manner, beam by beam, and column by column as described above.

For the higher stories, the Cat 345 (or equivalent) excavator operator will approach and cut the first roof beam at the end of the beam just inside the outer column line. The operator will then bend the beam downward before freeing the other end of the beam from the opposing column. The freed beam will then be lowered to the building slab by the operator for size reduction and live load out. The roof section within the bay will then be forced downward and collapsed onto the floor below. Debris generated will then be raked off of the floor below and directly to grade for processing and load out below by the other track-hoes. The vertical columns of the bay will then be bent inward and sheared from place. Once separated, the vertical columns will then be lowered to grade for further processing and load out. As deconstruction proceeds, this approach may be altered to enhance productivity and to maintain proper safety requirements (e.g. no personnel within the building footprint during deconstruction).

Deconstruction of areas higher than one-story will be performed on the upper stories of the facility by the larger Cat 345 (or equivalent) excavator. The deconstruction of the lower two stories is more safely and efficiently handled by the PC 300 (or equivalent) hydraulic excavator, and will be demolished in a similar manner to the previously mentioned low rise sections of the facility. This phasing of the type of excavator used will promote the efficient deconstruction of the facility, (i.e. the efficient use of the building slab space to package wastes).

No personnel shall be permitted in any area of the building footprint once deconstruction commences. All deconstruction activities pertaining to the packaging, handling, and loading of wastes from the building footprint into the IMCs will occur via the excavators. The excavator machines will remain outside of the debris piles at all times, proceeding from the outside-in, to prevent the unintentional disturbing of debris that could result in worker injury.

Activities to proceed with any non-excavator dismantling activities will only occur once a competent person has determined that the area is safe. It is anticipated that during deconstruction activities, workers will only be present either operating the heavy equipment, or present in the IMC loading areas (i.e. opening IMCs, lining them, and closing them).

6.2 BULK STEEL RECYCLING

Although previously decontaminated in the 1960s, Building G-1 contains areas with residual radiological contamination. The ECC health physicist will survey the building for radioactive contamination and delineate areas below action levels allowing for unrestricted release in accordance with the SAP and the criteria set forth in the Nuclear Regulatory Commission's (NRC) guidance. Building components in this survey will only include structural steel (I-Beams, columns and flat steel). Items with inaccessible surfaces such as steel piping will not be

included. Whenever radioactive contamination on the steel is found, reasonable efforts should be made to remove all contamination and ALARA is implemented.

All radiologically contaminated building debris (except for steel that has been surveyed and released for unrestricted use) will be staged for subsequent processing, loading, transportation and disposal at a properly licensed/permitted disposal facility.

Radioactively contaminated floor slab will be marked for potential remediation to meet unrestricted release criteria for the removable radiological component (NRC Regulatory Guide 1.86; NRC, 1974) consistent with the end state scope of work. ECC's Health Physics Team will certify in their surveys that release criteria and compliance have been achieved.

Soil will be surveyed (within 15 meters of work areas) and areas with elevated radiological levels will be covered with a permanent cover per the SOW (USACE, 2014) in order to prevent the migration of radiological contamination off-site.

Additional details on the management of radioactive contamination can be found in the APP/SSHP and Deconstruction Plan for the project (ECC, 2014a and ECC 2014c).

7.0 BUILDING SLAB DECONTAMINATION

If the post deconstruction survey by the HP or HP Technician discovers that the building slab contains radiological surface contamination above the NRC criteria, decontamination of the building slab will proceed to bring contamination levels under acceptable criteria for facility retirement.

The radiological decontamination of the concrete will be performed utilizing dry decon techniques to minimize the creation of additional liquid waste. Two types of dry decon methods will be used. The first is a blastrac® (or equivalent) type system, which will be used on the horizontal surface. The second is a vacublast ® (or equivalent) type system. This system will be used on vertical and overhead surfaces.

The blastrac type system is a portable shot blast cleaning system, capable of removing up to ¼ inch of floor surface at a single pass. It contains a high performance airless centrifugal wheel for propelling shot in a controlled pattern and direction. Dust created from removal operations will be collected by a separate dust collector system, which will be equipped with a HEPA filter to protect from air borne contamination.

The vacublast type system is a closed circuit system that uses compressed air, mixed with an abrasive agent, to perform the removal action. The abrasive agent is propelled through a blast gun and recovered continually through the removal action. Any dust created during removal operations is collected inside the closed blast gun system, and HEPA filtered to control air borne contamination.

8.0 POST DECONSTRUCTION ACTIVITIES

These activities involve the clean-up and restoration of the site. There is additional work that may disturb the soils of the site, which includes the investigation of the underground sewer pipe of Building G-1. Such activities are anticipated to proceed after the clean-up and demobilization of the majority of the deconstruction team's equipment and wastes.

All project derived wastes (except those generated though the drilling and groundwater sampling) are anticipated to be transported as described, by IMC, onto rail to the same landfill facility (which accepts radiological impacted hazardous waste and construction debris) for final disposition.

8.1 CLEANUP

All debris and waste will be removed from the project site, and live loaded into the IMCs, and handled in the same fashion as the solid building debris disposal. After all wastes have been removed, the Project team will remove all temporary facilities and structures, and dismantle and properly dispose of erosion and sediment control facilities.

Equipment/supplies that entered a radiological area will be surveyed and decontaminated, as necessary prior to their release from the site. The equipment/supplies will also be provided to the USACE for their own radiological surveys to check the quality of the decontamination work.

The Project Team will perform a post-construction radiological survey of the Building G-1 slab surface and the surrounding work areas (survey limit will be 15 meters outside of the actual work areas, per the established buffer-zone requirement). The survey will be performed by the HP and their authorized personnel as outlined in the SAP (ECC, 2014d). The results will be compared to the pre-construction radiological survey and unrestricted release criteria as set forth in the QCP (ECC, 2014b).

8.2 SITE RESTORATION

Disturbed areas will be restored to pre-deconstruction condition at the completion of cleanup and radiological survey activities, including the water line test-pitting investigation, and activities associated with the installation and abandonment of the site's groundwater monitoring well network.

8.3 DEMOBILIZATION

A demobilization approach will be submitted to the USACE for review at least 15 days prior to the initiation of any demobilization activities. Demobilization will be scheduled for completion within 15 days of completion of field activities. All equipment, which came into contact with contaminated materials, will undergo a thorough wet or dry decontamination, whichever is most appropriate. The Project Team shall collect and contain all water generated during the equipment decontamination activities for sampling, analyses, and proper disposition per the WMTDP (ECC, 2014e) and the provisions described in **Section 5.5** of this work plan.

The demobilization will be coordinated by the Project Team to remove all personnel, equipment, supplies, and/or other material generated. A final parcel inspection will be conducted by the site manager or designated representative prior to final departure of all personnel from the site.

8.4 PROJECT CONSTRUCTION REPORT

At the end of the project, ECC will prepare and submit a final narrative construction report summarizing all activities associated with the deconstruction of Building G-1. The construction report will include all project records, including lower-tier subcontractor(s) records, in accordance with all applicable codes, standards, and regulations. It will be submitted to the USACE for review and approval, and considered part of the other features of work of this project including the results of the test-pit investigation and the results of the groundwater sampling and groundwater monitoring related activities, that also require construction reports.

9.0 REFERENCES

ECC, 2014a. *Accident Prevention Plan/Site Safety and Health Plan* for Former Harshaw Chemical Building G-1 Deconstruction and Groundwater Investigation, Cleveland, OH. Contract Number W912P4-07-D-0005. ECC, September 2014.

ECC, 2014b. *Contractor Quality Control Plan* for Former Harshaw Chemical Building G-1 Deconstruction and Groundwater Investigation, Cleveland, OH. Contract Number W912P4-07-D-0005. ECC, September 2014.

ECC, 2014c. *Site Operations Plan* for Former Harshaw Chemical Building G-1 Deconstruction and Groundwater Investigation, Cleveland, OH. Contract Number W912P4-07-D-0005. ECC, September 2014.

ECC, 2014d. *Sampling and Analysis Plan* for Former Harshaw Chemical Building G-1 Deconstruction and Groundwater Investigation, Cleveland, OH. Contract Number W912P4-07-D-0005. ECC, September 2014.

ECC, 2014e. *Waste Management, Transportation, and Disposal Plan* for Former Harshaw Chemical Building G-1 Deconstruction and Groundwater Investigation, Cleveland, OH. Contract Number W912P4-07-D-0005. ECC, September 2014.

Interstate Technology Regulatory Council (ITRC), 2003. *Technical and Regulatory Guidance for the Triad Approach: A New Paradigm for Environmental Project Management*. Final, December 2003.

Nuclear Regulatory Commission (NRC), 1974. *Regulatory Guide 1.86 – Termination of Operating Licenses for Nuclear Reactors.* Published June 1974, Latest Evaluation September 2007.Ohio Environmental Protection Agency (OH EPA), 2014. *Guide to Environmental Permitting in Ohio*, Office of Compliance Assistance and Pollution Prevention. April, 2014.

US Army Corps of Engineers (USACE), 2009. *Remedial Investigation Report: Former Harshaw Chemical Site Remedial Investigation*, Cleveland, OH. Contract Number W912P4-04-D-0001 DO-0004. U.S. Army Corps of Engineers, Buffalo District. December, 2009.

USACE, 2012. *Feasibility Study Report: Former Harshaw Chemical Company Site*, Cleveland, OH. September, 2012. Contract Number W912QR-08-D-0008 DO-0003. U.S. Army Corps of Engineers, Buffalo District. September, 2012.

USACE, 2014. *Scope of Work for Building G-1 Deconstruction and Groundwater Investigation*, Cleveland, OH, April 2014. U.S. Army Corps of Engineers, Buffalo District.

Figure 1-1 Site Layout

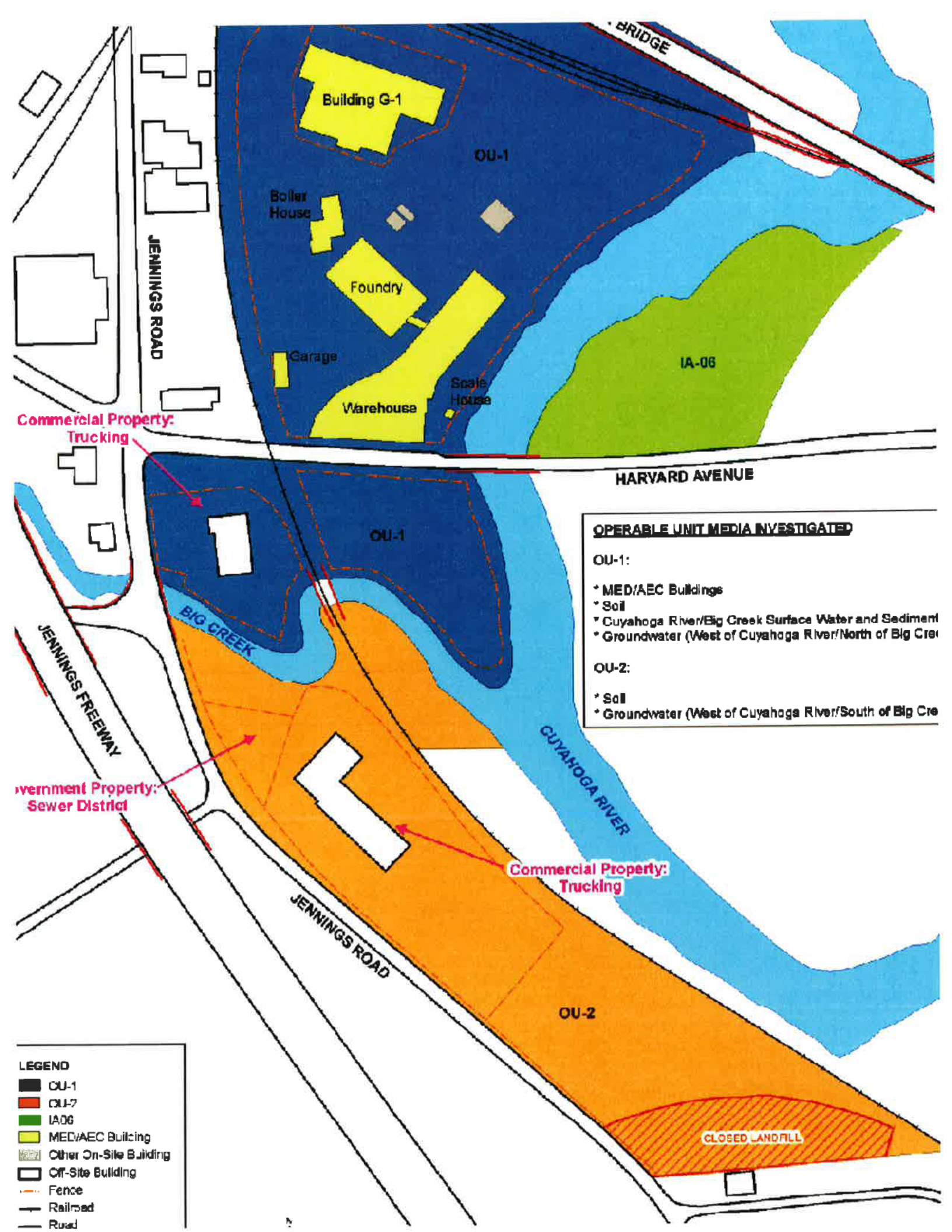
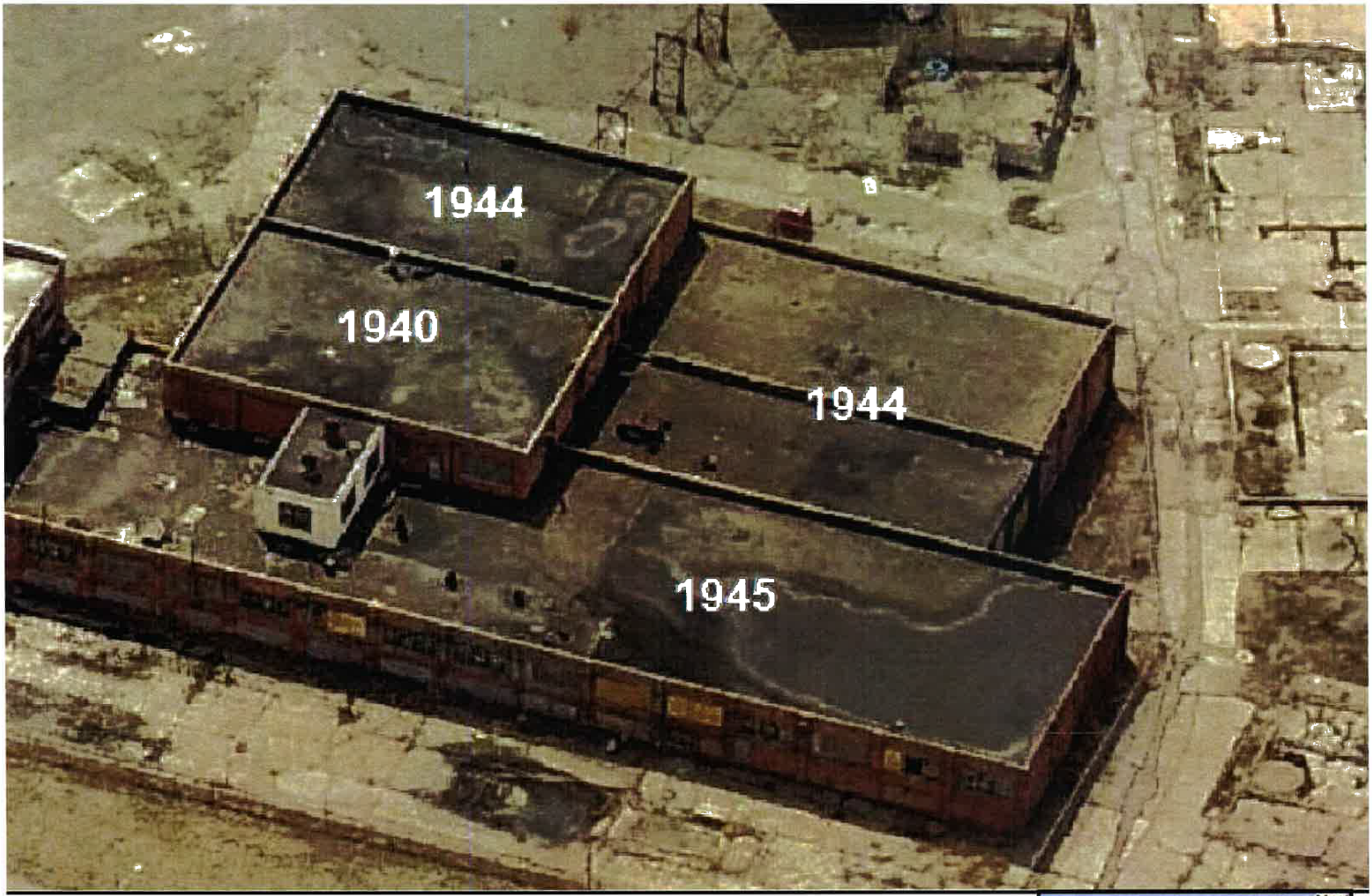

BRIDGE
Building G-1
OU-1
Boiler House
Foundry
Garage
Warehouse
Scale House
IA-06
JENNINGS ROAD
HARVARD AVENUE
Commercial Property: Trucking
OU-1
BIG CREEK
JENNINGS FREEWAY
CUYAHOGA RIVER
vernment Property: Sewer District
Commercial Property: Trucking
JENNINGS ROAD
OU-2
CLOSED LANDFILL
OPERABLE UNIT MEDIA INVESTIGATED
OU-1:
* MED/AEC Buildings
* Soil
* Cuyahoga River/Big Creek Surface Water and Sediment
* Groundwater (West of Cuyahoga River/North of Big Cre
OU-2:
* Soil
* Groundwater (West of Cuyahoga River/South of Big Cre
LEGEND
OU-1
OU-2
IA06
MED/AEC Building
Other On-Site Building
Off-Site Building
Fence
Railroad
Road

Figure 6-1 Building Layout


1944
1940
1944
1945


Eastlake
Willoughby
Euclid
Cleveland Heights
Cleveland
South Euclid
Shaker Heights
Lakewood

N

0 0.55 1.1

Attachment A:
Engineering Survey

Building G-1 Deconstruction and Groundwater Investigation Cleveland, Ohio

Contract No. W912P4-07-D-0005

Prepared by:

ECC

110 Fieldcrest Avenue, Ste. 31

Edison, NJ 08837

Prepared for:

U.S. Army Corps of Engineers (USACE)

Buffalo District
Buffalo, New York

US Army Corps of Engineers®
Buffalo District

December 2014

PRE-DEMOLITION ENGINEERING SURVEY
(Attachment A to the Deconstruction Plan)

Building G-1 Deconstruction Plan

Final

Prepared By:

[redacted] _____ _____
Date

Reviewed By:

[redacted] _____ _____
Date

Approved By:

[redacted] _____ _____
Date

- [ ] New Plan
- [ ] Title Change
- [X] Plan Revision
- [ ] Plan Rewrite

Effective Date

Project Background

DEMCO has utilized a professional engineer licensed in the State of Ohio to perform this Engineering Survey. The survey is in compliance with ANSI A10.6, 29 CFR 1926.850 and SEI/ASCE 11-99, *Guideline for Structural Condition Assessment of Existing Buildings".* This Engineering Survey is the basis for the sequence and technical approach incorporated in the Deconstruction Plan, including identification of specific demolition equipment to be utilized.

DEMCO is performing work associated with the Building G-1 Deconstruction and Groundwater Investigation Project as a subcontractor to Environmental Chemical Corporation (ECC) under contract number W912P4-07-D-0005.

The Former Harshaw Chemical Company Site produced a number of major and minor uranium products in various forms under contract. Historic accounts describe five thousand metric tons of uranium were processed between 1942 and 1954. Major products included uranium tetrafluoride (UF_4) (Green Salt), Uranium hexafluoride (UF_6), and uranium trioxide (UO_3). The major processing plants located within Building G-1 were the Refinery and Brown Oxide Plant, which produced UO_3 and uranium dioxide (UO_2), respectively. Also located in Building G-1 were the UF_4 plant and the UF_6 plant. Plant activities were confined to the currently fenced area around Building G-1, and included the use of the former rail yard adjacent to Building G-1. Site investigations also discovered surface contamination in the former Foundry (previously designated as Building F-1), Garage and Warehouse buildings. However these buildings are not covered in this scope of work.

These operations were carried out within the Building G-1 complex, which was built and expanded several times over the period from 1940-1948. The Building G-1 complex lies within a 1.6-acre fenced area located in the northern portion of the Former Harshaw Chemical Company Site. This area in the vicinity of the uranium operations was designated as Operational Unit -1 (OU-1) and investigated accordingly.

The site is located at 1000 Harvard Avenue in Cleveland, Ohio. The site is surrounded by industrial operations and residential areas. The site is located adjacent to the Cuyahoga River and Big Creek within an industrialized area in Cuyahoga County. Neighboring industries include Mittal Steel, Aluminum Company of America, Chemical Solvents, Inc. and CSP Fabricating. The site consists of approximately 55 acres and includes several developed and undeveloped land parcels located near the intersection of Harvard Avenue and Jennings Road. Developed site parcels include former production areas and remaining facility buildings, former production area foundations, parking areas associated with previously dismantled buildings, and re-developed, privately-owned commercial properties.

Description of Building G -1

Building G-1 is a three (3) story building that was constructed in phases between 1940 and 1948. It is comprised of the following materials: structural steel floor beams under concrete slab/deck, structural steel roof beams under precise plank or concrete deck (flat roof with parapet walls on perimeter), and load bearing exterior masonry walls. The building is 65,800 square feet (sf) with 47,400 sf on the first floor; 15,200 sf on the second floor; and 3,200 sf on the third floor. The property line only extends to the fence line running closely outside the building (approximately 1.5 acres). The building has been vacant for more than thirty (30) years. The perimeter walls of the building are masonry brick strengthened by pilasters and are a variation of the Common (or American) Bond type orientation. This brick layout (bond) orientation consists of rows with alternating directions. Stretchers (bricks with their longest side parallel with the wall surface) are placed in 8-9 courses (rows). Each group of these 8-9 rows is separated by a header course (bricks aligned with the longest side perpendicular to the wall surface). It is typical of masonry construction for manufacturing facilities of this age. The internal support system is a combination of steel and concrete framing which supports the concrete plank style roof and/or concrete slab flooring. The ground floor walking service is a combination of concrete slab on grade or running brick pattern.

ECC / DEMCO have been advised that certain issues associated with the building deconstruction may require special removal/abatement precautions, including, but not limited to the following:

- Bird and animal waste.
- Potential Asbestos Containing Material (ACM).
- Potential lead-based paint on surfaces within and outside Building G-1.
- Potential PCB-based paint on surfaces within and outside Building G-1.
- Potentially contaminated brick and concrete.
- Potentially contaminated steel beams and rafters inside.
- Potentially contaminated floor drains and sumps.
- Potentially contaminated soils around the perimeter of Building G-1.
- Miscellaneous debris inside of Building G-1

Regulatory Background

The deconstruction of Building G-1 is being managed by the USACE under the authority of FUSRAP.

Regulatory Compliance

ECC / DEMCO shall comply with all applicable Federal, State and local regulations for performing work under this contract.

This Pre-Demolition Engineering Survey is in accordance with ANSI A10.6 – 2006 and SEI/ASCE 11-99 'Guideline for Structural Condition Assessment of Existing Buildings'.

Overall Structural Assessment of Building G-1

General Comments

- Structural Concerns: None - Typical for building materials and age. No damaged noted from fire, flood, or winds. Building is structurally sound and it is not anticipated that any pre-mature collapse not associated with specific building sections will occur. Sections of the roof have deteriorated over the years and locations have been repaired. Workers will be not permitted to access the roof areas.
- During deconstruction, continuing inspections by a competent person shall detect hazards resulting from weakened or deteriorated floors, walls, or loosened material. No employee shall be permitted to work where such hazards exist and conditions shall be mitigated with mechanical equipment. A construction exclusion zone will be established around Building G-1 in the event some debris during deconstruction fall outside the footprint of the building.

Possible use of Temporary bracing / support

- No shoring bracing / support required based on work method. Work shall be sequenced to be dismantled using a combination controlled cut and pull and a top to down direction as per 1926 – Subpart D, ANSI Standard A10.6 and EM 385-1-1 Section 23 Demolition.

Mitigation of Premature Collapse

- Debris material shall be removed from all floor levels and not permitted to accumulate before commencing the removal of exterior walls and floors in the next story below. The Building does not feature roof cornices or other ornamental stonework that requires removal prior to wall deconstruction.

PRE- DEMOLITION ENGINEERING SURVEY

Job Name: Harshaw Chemical	Location: Cleveland, Ohio USA
Job #:678	Phone #:716 674-0883
Job Contact: [redacted]	Fax #: 716 674-0884
Name of Area: USACE-BUF	
Name of Structure: Building G-1	

Method of Demolition: Mechanical Demolition with grapple and hammer attachment of the steel and concrete structure.

Note: Pre-Demolition survey to be completed for each area.

Safety Exposures	**Yes**	**No**	**N/A**	**Location/Description**
Adjacent Public Areas		X		None. River 500' away.
Adjacent Roadways		X		350' feet away.
Adjacent Buildings		X		Closest occupied 250' feet away.
Basements		X		Trenches in slab.
Cable Trays		X		
Chemical Exposures		X		
Combustibles	X			Very limited, roofing, small amounts of wood.
Communication Lines		X		
Confined Space		X		
Electrical Lines		X		
Elevator	X			Two elevators decommissioned.
Fall Hazards	X			Openings currently covered.
Fiber Optics		X		
Fire Hazards		X		Limited combustible materials present.

Safety Exposures	Yes	No	N/A	Location/Description
Hydrogen Lines/ Tank		X		
Lead Exposure	X			Minimal exposure anticipated due to demolition techniques employed.
Live Electrical		X		Will field verify any newly identified lines.
Natural Gas Lines		X		Will field verify any newly identified lines.
Nitrogen Lines		X		
SDS			X	No facility SDS available. SDS are readily available for materials brought on site.
Oil Lines/ Tanks		X		
Oxygen Lines		X		
Partition Walls	X			Partition walls exist between addition structures.
Pits / Trenches	x			Small trenches in process areas. Areas to be cleaned out and filled with gravel / concrete prior to deconstruction.
Process Hazards		X		Most process equipment previously removed.
Process Lines		X		Most process lines previously removed.
RAD Exposure	X			Decommissioning work to be performed in compliance with RWPs.
Shoring Requirements		X		No shoring required. No project personnel allowed in work area during mechanical deconstruction of the facility.
Stacks			X	
Water Lines		X		
Water Tower			X	
Structural Concerns	X			Partial collapse of exterior wall.
Describe:				Exterior walls in poor condition.

Environmental Issues	Yes	No	N/A	Location / Description
Asbestos	X			Roofing – Non-friable. Interior / exterior ACM detected in Survey has been removed. ACM mastic to remain.
Backfill Material			X	
Contaminated Water		X		
Contaminated Soil	X			Subsurface disturbance to be avoided.
Hazardous Waste		X		
Hydrocarbons		X		
Heavy Metals		X		
Lead Exposure	X			Lead paint is present in the facility. Minimal exposure anticipated due to demolition techniques employed.
PCB	X			Building may contain PCB based paint – samples to be collected.
Special Waste	X			Radioactive waste is present within the facility.

CFR Applicability / Clarification:

Listed below are specific sections of 29 CFR 1926, 1962 that apply to Building G-1 deconstruction with clarifying mitigation or non-applicability:

- 1926.850(a); Condition of structural framing and floors are currently structurally sound.
- 1926.850(b); The structure has not been damaged by fire of flood, etc. Regardless, only essential workers will be permitted inside building during dismantlement.
- 1926.850(c); All utilities including, but not limited to electric, gas, water, steam, sewer, have been disconnected and verified by the field superintendent.
- 1962.850(d); No power or other utilities will remain active within the demolition boundary.
- 1962.850(e); No hazardous chemicals, gasses, explosives, flammable materials (except product of deconstruction), or other dangerous materials remain in the building.
- 1926.850(f); Glass fragmentation is not considered a hazard as personnel will not be allowed in the demolition area after commencement of deconstruction.
- 1926.850(g); Hazards relating to openings in floors will be barricaded to a height of 42" (as required).
- 1926.850(h); Debris may drop though barricaded openings in the floors to grade level.
- 1926.850(i); Floor openings will be barricaded or no personnel will be allowed in area after the start of deconstruction. Prior to deconstruction, all existing handrail, guards, etc., will remain in place.
- 1926.850(j); In general, the structure will be deconstructed from the top down by completing controlled pulls of building sections after regulated materials have been removed.
- 1926.850(k); Regarding employee entrances to multi story structures being demolished;
    - This is not applicable since only essential workers will be allowed in the work area.
- Water will be used to minimize the amount of dust generated during demolition activities.

Completed by:

[redacted]

PE – State of Ohio

12/8/14

Date

[redacted]

Environmental Safety and Health Manager (ES&HM)

12/9/14

Date

[redacted]

Attachment B:
Hazardous Materials Survey

Environmental Chemical Corporation
Edison, New Jersey

Hazardous Materials Survey
Former Harshaw Chemical Company
1000 Harvard Avenue
Cleveland, Ohio

October 2014

TTL associates inc
Environmental, Geotechnical Engineering & Testing

TTL associates inc
Environmental, Geotechnical Engineering & Testing

1915 North 12th Street
Toledo, OH 43604-5305
T 419-324-2222
F 419-241-1808
www.ttlassoc.com

October 14, 2014

TTL Project No. 11762.01

[redacted]
Environmental Chemical Corporation
110 Fieldcrest Avenue Suite 31
Edison, New Jersey 08837

Hazardous Materials Survey Report
Former Harshaw Chemical Company
1000 Harvard Avenue
Cleveland, Ohio

Dear [redacted]

The report for the Hazardous Materials Survey conducted for Environmental Chemical Corporation (ECC) for the above-referenced site is enclosed. TTL understands the purpose of this project was to provide an asbestos, lead based paint (LBP) and hazardous materials survey at the above referenced site for demolition activities. This project was authorized by the TTL Proposal No. 11762.01 dated June 9, 2014.

TTL appreciates the continued opportunity to provide ECC with our consulting and testing services. Should you have any questions or require additional information, please contact [redacted]

Sincerely,

TTL Associates, Inc.

[redacted]
Industrial Hygienist

[redacted]
Manager, Asbestos Services

V:\Toledo\Misc_A_M\Environmental Chemical Corporation\HazMat Survey\11762.01 Harshaw Chemical\Report\Hazardous Material Survey Report.docx

HAZARDOUS MATERIALS SURVEY REPORT
FORMER HARSHAW CHEMICAL COMPANY
1000 HARVARD AVENUE
CLEVELAND, OHIO

FOR

ENVIRONMENTAL CHEMICAL CORPORATION
110 FIELDCREST AVENUE SUITE 31
EDISON, NEW JERSEY 08837

SUBMITTED

OCTOBER 14, 2014
TTL PROJECT NO. 11762.01

TTL ASSOCIATES, INC.
1915 NORTH 12TH STREET
TOLEDO, OHIO 43604
(419) 324-2222
(419) 321-6252 FAX

TTL associates | inc
Environmental, Geotechnical Engineering & Testing

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

TTL Associates, Inc. (TTL) conducted an asbestos, Lead-Based Paint (LBP) and hazardous materials survey at the former Harshaw Chemical Company located at 1000 Harvard Avenue in Cleveland, Ohio. The purpose of the survey was to identify asbestos-containing materials (ACM) and LBP for demolition activities.

[redacted] and [redacted] of TTL conducted the survey on September 24, 2014.

TTL's scope of work included the following:

- Surveying the facility for suspect ACM.
- Collection of suspect ACM bulk samples for analysis by Polarized Light Microscopy (PLM) to determine asbestos content.
- LBP inspection of selected areas by X-Ray Fluorescence (XRF) Analyzer, Serial Number 25587.

1.1 Asbestos Survey

TTL identified twenty (20) suspect ACM and collected and analyzed forty-four (44) bulk samples. The number of samples collected from each suspect ACM was determined by the quantity of material present. Laboratory analysis identified seven (7) materials as ACM.

1.2 Lead-Based Paint Survey

TTL identified lead based paint in the building using an XRF analyzer. There were thirty-four (34) surfaces identified to contain LBP above one (1) milligram per square centimeter (mg/cm^2).

1.3 Hazardous Materials Survey

A survey of hazardous materials was also conducted by TTL during the NESHAP asbestos survey. The purpose of the limited hazardous materials survey was to identify building components that may contain suspect hazardous materials. TTL's scope of work did not include the collection and/or analysis of suspect hazardous materials. The observed site building components that were quantified during the hazardous materials survey included:

- Fluorescent Bulb Light Fixtures – suspected of containing polychlorinated biphenyl (PCB) ballasts and/or fluorescent light bulbs containing mercury vapor
- Refrigeration Units – suspected of containing chlorofluorocarbon refrigerants
- Mercury Vapor Light Bulbs
- Large Industrial Fuses – suspected of containing silver and other metals

2.0 INTRODUCTION

TTL Associates, Inc. (TTL) conducted an asbestos, lead based paint (LBP) and hazardous materials of the former Harshaw Chemical Corporation located at 1000 Harvard Avenue in Cleveland, Ohio.

2.1 Project Purpose and Objectives

TTL conducted the survey in accessible areas of the site building to determine the presence of Asbestos-Containing Material (ACM), LBP and hazardous materials which may require removal prior to demolition and renovation activities.

2.2 Personnel

[redacted] and [redacted] of TTL conducted the survey. [redacted] is a certified State of Ohio Department of Health Asbestos Hazard Evaluation Specialist. [redacted] has successfully completed the Manufacturer's Training Course for the NITON Spectrum Analyzer and the Lead Inspector and Risk Assessor Training in accordance with the requirements of 40 CFR 745.225, (d) 1; HUD Guidelines for Lead Inspectors; LEAD POISONING PREVENTION CODE 845.28. Copies of their certifications are included in Appendix A.

3.0 ASBESTOS SURVEY

This section documents the results of the asbestos survey.

3.1 Homogenous Areas

Each accessible area was surveyed for suspect ACM and included the identification of suspect materials and the definition of homogeneous sampling areas (HSA), assessment of the condition of each material, estimation of the approximate quantity of the suspect ACM, and collection and analysis of representative bulk samples from each identified HSA. An HSA is defined as a material that exhibits similar physical characteristics (e.g., texture, surface color, and appearance) and was applied or installed during the same construction period (if known) as determined by TTL's inspection team utilizing professional judgment, experience, and historical building information.

3.2 Sampling and Analysis Methods

TTL provided a State of Ohio Department of Health Certified Asbestos Hazard Evaluation Specialist to conduct the inspection of the site building's interior components. [redacted] of TTL conducted the inspection. Refer to Appendix A for his certification.

Suspect ACM samples were collected using a coring device or other means, as appropriate, to collect a cross section of the suspect material. The samples were placed into clean, unused sealable bags and marked with a unique sample identification number. The samples of suspect ACM were transported to TTL and analyzed by Polarized Light Microscopy (PLM) using U.S. EPA Method 600/R-93/116. The EPA/600/R-93/116 "Method for the Determination of Asbestos in Bulk Building Materials" requires that all multiple, distinct layers must be analyzed individually. Sample analysis results are provided for each distinct layer of each sample submitted to the laboratory.

TTL's laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP), which is administered by the National Institute of Standards and Technology. The laboratory accreditation number is included in the analytical report.

3.3 Asbestos Analytical Results

TTL identified twenty (20) suspect ACM, collected and analyzed forty-four (44) samples and fifty-nine (59) sample layers of suspect ACM. Seven (7) suspect materials were identified as ACM.

Table 1.0 below summarizes of the identified and assumed ACM including material description, material location and estimated quantities. Refer to Appendix B for a detailed list of all identified suspect materials, quantities and presence of asbestos. Asbestos sampling location maps are provided in Appendix C. A copy of the asbestos laboratory analytical report is presented in Appendix D.

Table 1.0
Identified and Assumed Asbestos-Containing Materials

HSA No.	Material Description	Functional Area	Quantity
08	9" x 9" Grey Floor Tile	Room 2-1	289 s.f.
13	9" x 9" Grey Floor Tile and Associated Black Mastic	Room 2-4	1,200 s.f.
15	White TSI Debris	High Bay 3rd Floor in Wooden Crates	64 c.f.
18	White Pipe Insulation	Exterior	20 l.f.
21	Mud Pipe Fitting Insulation	Exterior	11 Fittings
23	Transite Panels	By Elevators	100 s.f.
26	Grey Transite Panels	Exterior	60 s.f.

l.f.-linear feet
s.f.-square feet

4.0 LEAD-BASED PAINT SURVEY

This section documents the LBP survey results.

4.1 Survey

TTL provided a Lead Risk Assessor certified, in accordance with U.S. EPA and Housing and Urban Development's (HUD) Title X regulation, to conduct the inspection of the site buildings' interior components. [redacted] of TTL conducted the LBP inspection.

[redacted] used a Niton X-Ray Fluorescence (XRF) Analyzer, Serial Number 25587, to conduct the inspection. A copy of the Niton XRF Analyzer data is included in Appendix E and site maps are contained in Appendix F. The Analyzer data table includes sample locations, condition of paint, and sample results. LBP is defined by U.S. EPA and HUD as containing more than 1.0 milligrams of lead per square centimeter (mg/cm^2) of area or 0.5% by weight. OSHA does not define lead based paint based on content. Any detectable lead in paint makes it a lead paint for the purposes of complying with OSHA regulations to determine worker exposure.

The bolded data contained in Appendix E identifies paint that contains lead as defined by US EPA and HUD.

4.2 Survey Results

During the lead survey, TTL identified areas of painted surfaces of different color, substrate and component.

Table 2.0 summarizes the results for the lead hazards:

Table 2.0
Lead-Based Paint Surfaces
Only Above 1 mg/m^3

Reading No.	Component	Substrate	Side	Condition	Floor	Room	Result mg/cm^2
24	WALL	BRICK	D	PEELING	FIRST	1	1.1
34	WINDOW	WOOD	C	POOR	FIRST	1	12.3
35	WINDOW	WOOD	A	POOR	FIRST	1	10.2
36	WINDOW	METAL	A	POOR	FIRST	1	1
38	COLUMN	METAL	A	POOR	FIRST	1	3.9
39	FLOOR	BRICK	A	POOR	FIRST	1	1
45	WALL	BRICK	B	POOR	FIRST	1	2.3
49	DOOR	METAL	A	POOR	FIRST	1	14
52	DOOR	WOOD	D	POOR	STAIRWELL	STAIRWELL	1.2
53	DOOR	METAL	B	POOR	STAIRWELL	STAIRWELL	9.3
66	FLOOR	CONCRETE	A	POOR	FIRST	3	1.4

Reading No.	Component	Substrate	Side	Condition	Floor	Room	Result mg/cm^2
69	DOOR FRAME	WOOD	A	POOR	FIRST	3	4.8
76	WALL	BRICK	B	POOR	FIRST	4	4.9
77	WALL	BRICK	C	POOR	FIRST	4	3.2
79	DOOR FRAME	WOOD	B	POOR	FIRST	4	2.1
81	DOOR	WOOD	A	POOR	FIRST	4	2.5
84	DOOR	WOOD	A	FAIR	FIRST	4	1.5
85	DOOR	WOOD	C	FAIR	FIRST	5	8.2
98	COLUMN	WOOD	C	POOR	FIRST	6	6
99	WINDOW FRAME	METAL	D	POOR	FIRST	6	1
113	WALL	CONCRETE	D	POOR	FIRST	7	2.4
116	DOOR	WOOD	C	POOR	FIRST	7	2.4
117	HAND RAIL	METAL	A	POOR	FIRST	7	2.8
126	WALL	CONCRETE	C	POOR	FIRST	8	2.5
140	DOOR	WOOD	B	POOR	FIRST	10	1.2
154	DOOR	WOOD	A	FAIR	FIRST	12	1.1
155	DOOR	WOOD	A	FAIR	FIRST	12	1.2
156	WALL	CONCRETE	A	FAIR	FIRST	12	1.5
162	DOOR	WOOD	A	POOR	FIRST	13	1.6
163	DOOR	METAL	A	POOR	FIRST	13	2.4
171	DOOR	WOOD	D	POOR	MEZZANINE	14	2.3
172	DOOR	WOOD	B	POOR	MEZZANINE	15	2.4
175	DOOR	WOOD	D	POOR	MEZZANINE	15	1.9
186	DOOR	WOOD	D	POOR	FIRST	18	2.8
188	WALL	CONCRETE	C	POOR	FIRST	18	6.5
193	COLUMN	METAL	B	POOR	FIRST	19	4.5
194	COLUMN	METAL	B	POOR	FIRST	19	8.6
199	COLUMN	METAL	A	POOR	SECOND	20	3.8
202	DOOR	METAL	B	POOR	THIRD	21	4.2
203	COLUMN	METAL	B	POOR	THIRD	21	6.2
209	COLUMN	METAL	A	POOR	SECOND	22	2.8
223	WALL	CONCRETE	B	POOR	SECOND	24	4.6
226	WALL	CONCRETE	D	POOR	SECOND	25	1
235	WALL	CONCRETE	D	POOR	SECOND	26	2.4
236	DOOR ELEVATOR	METAL	B	POOR	SECOND	26	1.4
237	SLOP SINK	METAL	D	POOR	SECOND	26	1
238	SLOP SINK	CONCRETE	D	POOR	SECOND	26	1
258	WALL	BRICK	A	POOR	SECOND	27	1.1

The Occupational Safety and Health Administration's (OSHA) Lead in Construction Standard 29 CFR 1926.62 states that any concentration of lead poses a potential for worker exposure when working with a lead-containing material.

5.0 HAZARDOUS MATERIALS SURVEY

TTL visually identified the following hazardous materials at the Site:

- Approximately 4 fluorescent bulbs, plus an unknown amount in a pile in Room 24
- Approximately 113 fluorescent light fixture ballasts, plus an unknown amount in a pile in Room 24
- Approximately 2 halogen flood light bulbs
- Approximately 4 large bus fuses
- Piles and areas of radioactive waste through-out building
- Approximately 18 mercury vapor light bulbs

Refer to Appendix G for the Hazardous Materials Summary Table.

6.0 CONCLUSIONS/RECOMMENDATIONS

This section summarizes the results of the asbestos and LBP survey and provides conclusions and recommendations.

6.1 Asbestos Survey

The U.S. EPA defines regulated asbestos-containing material (RACM) as: (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.

The National Emissions Standard for Hazardous Air Pollutants (NESHAP) asbestos regulations require the removal of all RACM from a facility being demolished or renovated prior to beginning any activity that might damage or disturb the material. The U.S. EPA requires written notification if the combined amount of RACM to be removed is at least 260 linear feet, at least 160 square feet, or at least one cubic meter of facility components where length or area could not be measured. The Ohio Department of Health requires ten day notification if the amount of RACM to be removed exceeds 50 square or linear feet.

The following Friable ACM was identified within the site building and requires removal prior to demolition activities:

- Approximately 64 cubic feet (c.f.) of white TSI debris (HSA 11762.01-15)
- Approximately 20 linear feet (l.f.) of white pipe insulation (HSA 11762.01-18)
- Approximately 11 fittings of mud pipe fitting insulation (HSA 11762.01-21)

The following Category I Non-Friable ACM were identified within the site buildings requires removal prior to demolition activities:

- Approximately 289 square feet (s.f.) of 9" x 9" grey floor tile (HSA 11762.01-08)
- Approximately 1,200 s.f. of 9" x 9" brown floor tile and associated black mastic (HSA 11762.01-13)

The following Category II Non-Friable materials were identified to contain asbestos and require removal prior to demolition activities:

- Approximately 100 s.f. of transite panels (HSA 11762.01-23)
- Approximately 60 s.f. of grey transite panels (HSA 11762.01-26)

TTL recommends the removal of the RACM and the ACM that might become RACM based on the project-specific renovation techniques by a licensed asbestos abatement contractor. Based on the condition of the material, the identified ACM may be expected to be a RACM.

A written Notification of Intent to Renovate/Demolish form is required to be submitted to the U.S. EPA or their designated authority, and ODH at least 10 working days prior to beginning any asbestos abatement and/or demolition project.

6.2 Lead-Based Paint Survey

TTL identified LBP that could be impacted by the demolition activities. Painted surfaces were identified as lead-based paint by XRF through-out the site building. LBP throughout building was in intact or not intact condition. TTL recommends any demolition work needs to be performed in accordance with the requirements of OSHA's Lead in Construction Standard 29 CFR 1926.62.

6.3 Hazardous Materials Survey

In accordance with EPA 40 CFR Part 261 (Standards applicable to Generators of Hazardous Waste) and Part 262 (Identification and Listing of Hazardous Waste) observed items that are to be disturbed during renovation or demolition activities will need to be identified, handled and disposed of properly in accordance with Parts 261 and 262.

All hazardous materials are to be handled and disposed of in accordance with federal, state, and local regulations.

6.4 Limitations

The scope of work for the asbestos survey did not include roofing materials. The on-site structural engineer deemed the roof unsafe to access; thus, it was not included in this hazardous material survey. TTL has made reasonable efforts to identify and quantify suspect ACM based upon the standard of care in the environmental industry existing at the time of the survey. This survey only summarizes the potential presence, estimated quantities of visually observed ACM, potential LBP, and visually observed hazardous materials.

Additional material disturbed during demolition activities should be evaluated on a case-by-case basis, especially materials that were previously hidden, obscured or inaccessible, to determine if the material is included in this survey. If a given material is not described in this survey or cannot be identified as a non-suspect material, the material should be assumed to contain asbestos, demolition activities should be halted until sampling, and analysis can be accomplished. Parties conducting demolition activities should follow all applicable federal, state, and local regulations in handling identified and suspect ACM.

The information contained in the report was based upon specific parameters and regulations in force at the time of the survey. The information herein is only for the specific use of ECC and TTL, unless written authorization is obtained from TTL. TTL accepts no responsibility for the use, interpretation, or reliance by other parties on the information contained herein, nor does this report represent an instrument of regulatory compliance or an asbestos abatement or lead based paint specification.

APPENDIX A

TTL CERTIFICATIONS


State of Ohio
Department of Health
Division of Quality Assurance - Asbestos Program
Asbestos Hazard Evaluation Specialist
[redacted]
5851 Spring Hollow Drive
Toledo OH 43615
Certification Number
ES35641
Expiration Date
07/23/2015
DOB: 08/29/1982
This certification is issued pursuant to Chapter 3710 of the Revised Code and 3701-34 of the Ohio Administrative Code
Certification Card is not valid if altered

NITON LLC

Certificate of Achievement

[redacted]

Performance Environmental Services, Inc.

has successfully completed the Manufacturer's Training Course for the **NITON Spectrum Analyzer** *and is now certified in radiation safety and monitoring, measurement technology, and machine maintenance of the* **NITON XRF Spectrum Analyzer**.

(CIH's – The ABIH Awards 1 CM point, approval # 05-396)

A5051738838
Certificate Number

05/19/05 Detroit, MI
Date & Site of Course

[redacted]
Training Coordinator

[redacted]
Director of Training

NITON

[redacted]

June 9, 2005

1150 Corporate Office Dr
Suite 200
Milford, MI 48381

[redacted]

Congratulations on successfully completing the Manufacturer's Training Course for NITON's portable Spectrum Analyzer instruments. We admire your effort in completing this course and are enclosing your Certificate. This certifies you in radiation safety and monitoring, measurement technology, and machine maintenance of the NITON XRF Spectrum Analyzer.

Now you can join the professionals who are turning to on-site technologies for the measurement of metals in lead-based paint, soil, air, and coatings as well as alloy identification. These technologies offer huge savings in measurement time and cost over conventional methods. At the same time, they have become widely accepted for regulatory accreditation and support.

- EPA lead program accepts XRF for lead paint testing, and verifies performance via "Performance Characteristics Sheets".
- The EPA lead program had implemented a full accreditation program for on-site lead analysis in soil, dust and paint.
- EPA/HUD Method 6200 is published for analysis of contaminants in soils and sediment using field portable X-Ray Fluorescence (XRF).
- NIOSH Method 7702 is published for on-site analysis of filters used for the measurement of airborne lead levels for worker exposure, using portable XRF.

NITON is the leading manufacturer of portable XRF analyzers for contaminant analysis. Instruments can be configured for nearly any application, including lead paint analysis, RCRA metal analysis for soils, coatings and contaminants in air. And readings take as little as a few seconds. For most applications, results meet laboratory-level accuracy standards. For "project oriented" companies, NITON even offers an attractive rental program. Every NITON XRF can be upgraded to keep pace with the changes in your business.

Please call us today to discuss your measurement needs. Our trained, technical staff will help you identify on-site testing methods to save you time and money. On-site analysis also greatly speeds the inspection and clearance process for remediation projects. We'll develop an instrument package that solves your problems. And we'll schedule and on-site demonstration at your convenience.

Please call us for further information, or visit our web site at **www.niton.com.** We are committed to solving your measurement needs.

Best regards,

[redacted]

900 Middlesex Turnpike, Building 8 • Billerica, MA 01821-3926 USA
Tel: 978-670-7460 • 800-875-1578 • Fax: 978-670-7430 • www.niton.com • email: xrf@niton.com

Certificate Number: 147475 - 12029

ETC Training Services Group

38900 W. Huron River Drive
Romulus, MI 48174-1159
(734) 955-6600

PRESENTS

[redacted]

with certification for having successfully completed the 24 hour/3 day which meets the requirements for

Lead Inspector Initial Training Course

in accordance with the requirements of 40 CFR 745.225, (d)1;
HUD Guidelines for Lead Inspectors;LEAD
POISONING PREVENTION CODE 845.28

Course Dates: November 11 - 13, 2013

6 months - 3rd Party Exam Eligibility Testing Valid Through: May 11, 2014

(3 years) Training Valid Through: November 11, 2016

[redacted]

Trainer

[redacted]

ETC President

Certificate Number: 13-35-0002

ETC Training Services Group

38900 Huron River Drive
Romulus, Michigan 48174-1159
(734) 955-6600

PRESENTS

[redacted]

with certification for having successfully completed the 16 hour/2 day course which meets the requirements for

Lead Risk Assessor Initial Training Course

in accordance with the requirements of 40 CFR 745.225, (d)2; HUD Guidelines for Lead Inspectors:LEAD POISONING PREVENTION CODE 845.28

Course Dates: November 14-15, 2013
6 months- 3rd Party Exam Eligibility-Testing Valid Through: May 14, 2014
(3 years) Training Valid Through: November 14, 2016

[redacted]
Trainer

[redacted]
ETC President

APPENDIX B

ASBESTOS SURVEY SUMMARY TABLE

Homogeneous Sampling Areas Table
Former Harshaw Chemical Corporation
1000 Harvard Avenue
Cleveland, Ohio

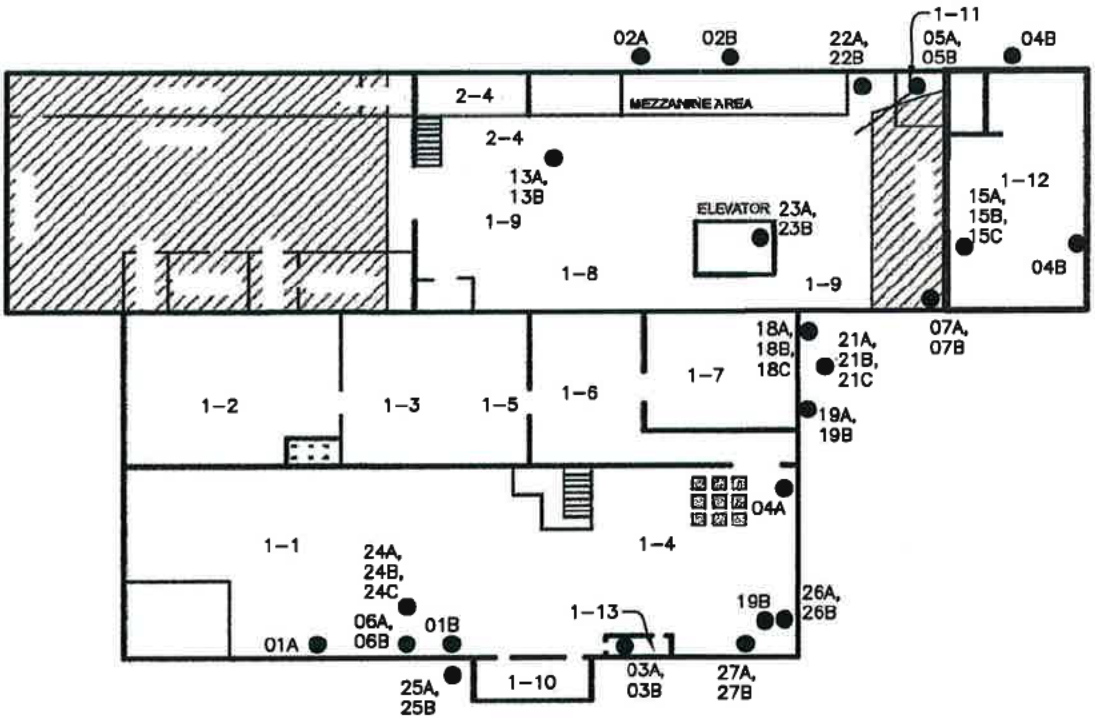
HSA #	Material Description	Friability	Functional Area	Quantity	Units	Sample Number	Sample Results
01	Concrete	NF-II	Room 1-1	1,500	s.f.	11762.01-01A, B	Negative
			Total	**1,500**	**s.f.**		
02	Light Grey Caulk	NF-II	Room 1-1 Exterior Walls	150	l.f.	11762.01-02A, B	Negative
			Total	**150**	**l.f.**		
03	White Pipe Insulation Debris	F	Room 1-13	400	s.f.	11762.01-03A, B	Negative
			Total	**400**	**s.f.**		
04	Brick Caulk	NF-II	Exterior of Building	NQ		11762.01-04A, B	Negative
			Total	**NQ**			
05	Drywall Ceiling Material	NF-II	Room 1-11	404	s.f	11762.01-05A, B	Negative
			Total	**404**	**s.f**		
06	Window Glazing	NF-II	Room 1-1	3,178	l.f.	11762.01-06A, B	Negative
			Total	**3,178**	**l.f.**		
07	White / Red Ash Debris Inside Pipe	F	Room 1-12	2	s.f.	11762.01-07A, B	Negative
			Total	**2**	**s.f.**		
08	**9" x 9" Grey Floor Tile and Associated Black Mastic**	**NF-I**	**Room 2-1**	**289**	**s.f.**	**11762.01-08A, B**	**Positive - Tile Only**
			Total	**289**	**s.f.**		
12	Black Sheet Flooring Material	NF-I	Room 2-3	1,715	s.f	11762.01-12A, B	Negative
			Total	**1,715**	**s.f.**		
13	**9" x 9" Brown Floor Tile and Associated Black Mastic**	**NF-I**	**Room 2-4**	**1,200**	**s.f.**	**11762.01-13A, B**	**Positive**
			Total	**1,200**	**s.f.**		

Homogeneous Sampling Areas Table
Former Harshaw Chemical Corporation
1000 Harvard Avenue
Cleveland, Ohio

HSA #	Material Description	Friability	Functional Area	Quantity	Units	Sample Number	Sample Results
15	**White TSI Debris**	**F**	**High Bay 3rd Floor in Wooden Crates**	**16**	**s.f.**	**11762.01-15A, B**	**Postive**
			Total	**16**	**s.f.**		
18	**White Pipe Insulation**	**F**	**Exterior**	**20**	**l.f.**	**11762.01-18A, B**	**Positive**
			Total	**20**	**l.f.**		
19	Ceramic Insulation Debris	F	Exterior	2	s.f.	11762.01-19A, B	Negative
			Total	**2**	**s.f.**		
21	**Mud Pipe Fitting Insulation**	**F**	**Exterior**	**11**	**fittings**	**11762.01-21A, B**	**Positive**
			Total	**11**	**fittings**		
22	Cloth Wire Insulation	NF-II	Exterior	20	l.f.	11762.01-22A, B	Negative
			Total	**20**	**l.f.**		
23	**Transite Panels**	**NF-II**	**By Elevators**	**100**	**s.f.**	**11762.01-23A, B**	**Positive**
			Total	**100**	**s.f.**		
24	Paper Thermal Insulation	F	Room 1-1	4	l.f.	11762.01-24A, B	Negative
			Total	**4**	**l.f.**		
25	Tar Sealing Material	NF-II	Exterior	10	s.f.	11762.01-25A, B	Negative
			Total	**10**	**s.f.**		
26	**Grey Transite Panels**	**NF-II**	**Exterior**	**60**	**s.f.**	**11762.01-26A, B**	**Positive**
			Total	**60**	**s.f.**		
27	Cable Insulation	NF-II	Exterior	40	l.f.	11762.01-27A, B	Negative
			Total	**40**	**l.f.**		
	NQ = Not Quantified						

APPENDIX C

ASBESTOS SAMPLE LOCATIONS MAP



LEGEND

01A ●	SAMPLE LOCATION
1-1	FIRST FLOOR ROOM 1
2-1	SECOND FLOOR ROOM 1

NOT TO SCALE

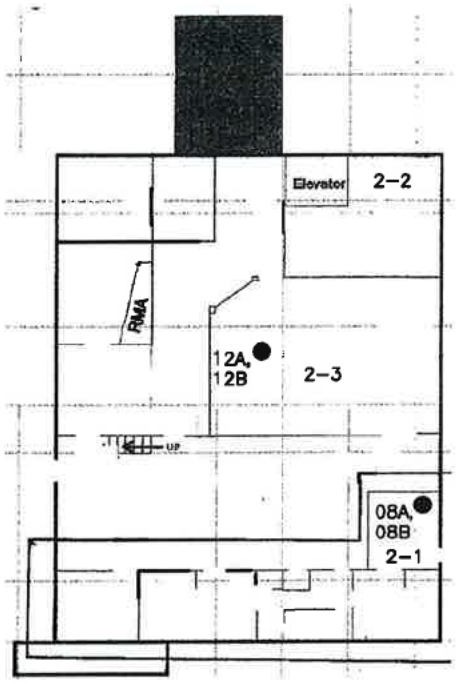
FIGURE 1.0
ASBESTOS SAMPLE SURVEY

FORMER HARSHAW CHEMICAL COMPANY
1000 HARVARD AVENUE
CLEVELAND, OHIO

PREPARED FOR
ENVIRONMENTAL CHEMICAL CORPORATION
EDISON, NEW JERSEY

DRAWN CLW/10-10-14	CHECKED
REVISED	APPROVED
JOB NO. 11762.01	
DRAWING NUMBER **1176201-03H**	

TTL associates inc



LEGEND

08A ●	SAMPLE LOCATION
1-1	FIRST FLOOR ROOM 1
2-1	SECOND FLOOR ROOM 1

NOT TO SCALE

FIGURE 2.0
ASBESTOS SAMPLE SURVEY

FORMER HARSHAW CHEMICAL COMPANY
1000 HARVARD AVENUE
CLEVELAND, OHIO

PREPARED FOR
ENVIRONMENTAL CHEMICAL CORPORATION
EDISON, NEW JERSEY

DRAWN CLW/10-10-14	CHECKED
REVISED	APPROVED
JOB NO. 11762.01	
DRAWING NUMBER **1176201-04H**	

TTL associates inc

APPENDIX D

ASBESTOS ANALYTICAL REPORT

1915 North 12th Street
Toledo, OH 43604-5305
T 419-324-2222
F 419-241-1808
www.ttlassoc.com

CLIENT: Environmental Chemical Corporation
110 Fieldcrest Avenue #13
EDISON, NEW JERSEY 08837

DATE: October 1, 2014

ATTN: [redacted]

Project No.: 11762.01

Lab Receiving No.: 14-09-204222

Date Received: September 25, 2014

Date Sampled: September 24, 2014

Project Location: Former Harshaw Chemical Company
1000 Harvard Avenue
Cleveland, Ohio

Sample Point(s): see analytical results

Analysis Performed: Asbestos Analysis by PLM

Reviewed by: [redacted] Date: 09/29/2014
[redacted], Lab Supervisor

Approved by [redacted] Date: 10/01/2014
[redacted] Technical Manager

ANALYTICAL NARRATIVE

The note(s) below pertain to the sample(s) and analytical data reported herein:

Quantitative results are listed as approximate % asbestos. Results are based on calibrated visual estimation of materials. All results <1% asbestos (Trace) have been confirmed by the analysis of a duplicate slide. As per the method, all "negative" or BDL samples have been confirmed by triplicate analyses. Due to the nature of the samples the following measurements of uncertainty may apply:

% Asbestos	Uncertainty
1%	± 2%
5%	± 4%
10%	± 5%
>20%	± 10%

Due to the complexity of analyzing floor tile by PLM, the client may want to consider having "negative" floor tiles analyzed further by an alternative method such as TEM.

Samples are archived by TTL Associates for a period of thirty days. Samples may be retained for a longer period of time or returned to the client upon written request.

Laboratory Accreditation:

U.S. Department of Commerce, National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program (NVLAP), Lab #101594-0. Accredited to the 1982 Interim Method for the Determination of Asbestos, 40 CFR, Part 763, Subpart E, Appendix E

This report may not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government. This report relates only to the items tested, and may not be reproduced, except in full, without the written approval of the laboratory.

Report Key:

BDL = Below Detection Level
n/a = not applicable
HSA = Homogeneous Sampling Area

Detection Level: 1% asbestos fibers greater than one micrometer in length.

POLARIZED LIGHT MICROSCOPY
ANALYTICAL RESULTS

METHOD NUMBER: EPA/600/R-93/116, July, 1993; 40 CFR, Ch. 1 (7-1-93 ed.), Part 763, Subpart F, Appendix A, pages 293-299

BATCH NUMBER: 2PLM017014, 2PLM017114, 2PLM017214

DATE ANALYZED: September 29, 2014

ANALYST: [redacted]

LAB No.	Sample ID	HSA No.	SAMPLE LOCATION	LAYER DESCRIPTION	NON-ASBESTOS COMPONENTS	APPROXIMATE % ASBESTOS
221148	1176201-01A	01	Along windows	Grey Plaster	100% Binder	BDL
221149	1176201-01B	01	Along windows	Grey Plaster	100% Binder	BDL
221150	1176201-02A	02	External walls	Grey Caulk	100% Binder	BDL
221151	1176201-02B	02	External walls	Grey Caulk	100% Binder	BDL
221152	1176201-03A	03	Room 1-13	White Insulation	96% Binder, 2% Fiberglass, 2% Synthetic Fibers	BDL
221153	1176201-03B	03	Room 1-13	White Insulation	96% Binder, 2% Fiberglass, 2% Synthetic Fibers	BDL
221154	1176201-04A	04	Room 1-7	Brown/White Plaster/Paint	100% Binder	BDL
221155	1176201-04B	04	Exterior	Brown/White Plaster/Paint	100% Binder	BDL
221156	1176201-05A Layer A	05	Room 1-11	White Gypsum Board	99% Binder, 1% Cellulose	BDL

POLARIZED LIGHT MICROSCOPY
ANALYTICAL RESULTS

METHOD NUMBER: EPA/600/R-93/116, July, 1993; 40 CFR, Ch. 1 (7-1-93 ed.), Part 763, Subpart F, Appendix A, pages 293-299

BATCH NUMBER: 2PLM017014, 2PLM017114, 2PLM017214

DATE ANALYZED: September 29, 2014

ANALYST: [redacted]

LAB No.	Sample ID	HSA No.	SAMPLE LOCATION	LAYER DESCRIPTION	NON-ASBESTOS COMPONENTS	APPROXIMATE % ASBESTOS
221156	1176201-05A Layer B	05	same	Grey Backing	100% Cellulose	BDL
221157	1176201-05B Layer A	05	Room 1-11	White Gypsum Board	99% Binder, 1% Cellulose	BDL
221157	1176201-05B Layer B	05	same	Grey Backing	100% Cellulose	BDL
221158	1176201-06A	06	Room 1-1	Beige Glazing Compound	100% Binder	BDL
221159	1176201-06B	06	Room 1-1	Beige Glazing Compound	100% Binder	BDL
221160	1176201-07A	07	Room 1-12, pipe	Tan Material	100% Binder	BDL
221161	1176201-07B	07	Room 1-12, pipe	Tan Material	100% Binder	BDL
221162	1176201-08A Layer A	08	Room 2-1	Dark Brown Floor Tile	96% Binder	**4% Chrysotile**
221162	1176201-08A Layer B	08	same	Black Mastic	100% Binder	BDL
221163	1176201-08B Layer A	08	Room 2-1	Dark Brown Floor Tile	95% Binder	**5% Chrysotile**

POLARIZED LIGHT MICROSCOPY
ANALYTICAL RESULTS

METHOD NUMBER: EPA/600/R-93/116, July, 1993; 40 CFR, Ch. 1 (7-1-93 ed.), Part 763, Subpart F, Appendix A, pages 293-299

BATCH NUMBER: 2PLM017014, 2PLM017114, 2PLM017214

DATE ANALYZED: September 29, 2014

ANALYST: [redacted]

LAB No.	Sample ID	HSA No.	SAMPLE LOCATION	LAYER DESCRIPTION	NON-ASBESTOS COMPONENTS	APPROXIMATE % ASBESTOS
221163	1176201-08B Layer B	08	same	Black Mastic	100% Binder	BDL
221164	1176201-12A Layer A	12	Room 2-3	Black Coating	100% Binder	BDL
221164	1176201-12A Layer B	12	same	Black Floor Tile	100% Binder	BDL
221165	1176201-12B Layer A	12	Room 2-3	Black Coating	100% Binder	BDL
221165	1176201-12B Layer B	12	same	Black Floor Tile	100% Binder	BDL
221166	1176201-13A Layer A	13	Room 2-4	Dark Brown Floor Tile	90% Binder	**10% Chrysotile**
221166	1176201-13A Layer B	13	same	Black Mastic	97% Binder	**3% Chrysotile**
221167	1176201-13B Layer A	13	Room 2-4	Dark Brown Floor Tile	90% Binder	**10% Chrysotile**
221167	1176201-13B Layer B	13	same	Black Mastic	97% Binder	**3% Chrysotile**
221168	1176201-15A	15	Third floor, wooden crates	Beige Insulation	84% Binder	**15% Amosite, 1% Chrysotile**

POLARIZED LIGHT MICROSCOPY
ANALYTICAL RESULTS

METHOD NUMBER: EPA/600/R-93/116, July, 1993; 40 CFR, Ch. 1 (7-1-93 ed.), Part 763, Subpart F, Appendix A, pages 293-299

BATCH NUMBER: 2PLM017014, 2PLM017114, 2PLM017214

DATE ANALYZED: September 29, 2014

ANALYST: [redacted]

LAB No.	Sample ID	HSA No.	SAMPLE LOCATION	LAYER DESCRIPTION	NON-ASBESTOS COMPONENTS	APPROXIMATE % ASBESTOS
221169	1176201-15B	15	Third floor, wooden crates	Beige Insulation	84% Binder	**14% Amosite, 2% Chrysotile**
221170	1176201-15C	15	Third floor, wooden crates	Beige Insulation	84% Binder	**14% Amosite, 2% Chrysotile**
221171	1176201-18A	18	Exterior	Light Grey Fabric Sheet	75% Binder, 10% Fiberglass	**15% Chrysotile**
221172	1176201-18B	18	Exterior	Light Grey Fabric Sheet	75% Binder, 10% Fiberglass	**15% Chrysotile**
221173	1176201-18C	18	Exterior	Light Grey Fabric Sheet	75% Binder, 10% Fiberglass	**15% Chrysotile**
221174	1176201-19A	19	Exterior	Grey Material	92% Binder, 8% Fiberglass	BDL
221175	1176201-19B	19	Exterior	Grey Material	92% Binder, 8% Fiberglass	BDL
221176	1176201-21A	21	Exterior	White Insulation	96% Binder, 4% Synthetic Fibers	BDL
221177	1176201-21B	21	Exterior	White Insulation	96% Binder, 1% Fiberglass, 3% Synthetic Fibers	BDL

POLARIZED LIGHT MICROSCOPY
ANALYTICAL RESULTS

METHOD NUMBER: EPA/600/R-93/116, July, 1993; 40 CFR, Ch. 1 (7-1-93 ed.), Part 763, Subpart F, Appendix A, pages 293-299

BATCH NUMBER: 2PLM017014, 2PLM017114, 2PLM017214

DATE ANALYZED: September 29, 2014

ANALYST: [redacted]

LAB No.	Sample ID	HSA No.	SAMPLE LOCATION	LAYER DESCRIPTION	NON-ASBESTOS COMPONENTS	APPROXIMATE % ASBESTOS
221178	1176201-21C Layer A	21	Exterior	White Insulation	96% Binder, 4% Synthetic Fibers	BDL
221178	1176201-21C Layer B	21	same	Light Grey Wrap	85% Binder	**15% Chrysotile**
221179	1176201-22A Layer A	22	Exterior	Black Coating	100% Binder	BDL
221179	1176201-22A Layer B	22	same	Off White Fabric	100% Cellulose	BDL
221180	1176201-22B Layer A	22	Exterior	Black Coating	100% Binder	BDL
221180	1176201-22B Layer B	22	same	Grey Fabric	100% Cellulose	BDL
221181	1176201-23A	23	By the elevator	Grey Transite	82% Binder	**18% Chrysotile**
221182	1176201-23B	23	By the elevator	Grey Transite	82% Binder	**18% Chrysotile**
221183	1176201-24A	24	Room 1-1	Tan Paper/Glue	35% Binder, 65% Cellulose	BDL
221184	1176201-24B	24	Room 1-1	Tan Paper/Glue	35% Binder, 65% Cellulose	BDL

POLARIZED LIGHT MICROSCOPY
ANALYTICAL RESULTS

METHOD NUMBER: EPA/600/R-93/116, July, 1993; 40 CFR, Ch. 1 (7-1-93 ed.), Part 763, Subpart F, Appendix A, pages 293-299

BATCH NUMBER: 2PLM017014, 2PLM017114, 2PLM017214

DATE ANALYZED: September 29, 2014

ANALYST: [redacted]

LAB No.	Sample ID	HSA No.	SAMPLE LOCATION	LAYER DESCRIPTION	NON-ASBESTOS COMPONENTS	APPROXIMATE % ASBESTOS
221185	1176201-24C	24	Room 1-1	Tan Paper/Glue	55% Binder, 45% Cellulose	BDL
221186	1176201-25A	25	Exterior	Black Tar	95% Binder, 5% Cellulose	BDL
221187	1176201-25B	25	Exterior	Black Tar	95% Binder, 5% Cellulose	BDL
221188	1176201-26A	26	Exterior	Grey Transite	85% Binder	**15% Chrysotile**
221189	1176201-26B	26	Exterior	Grey Transite	85% Binder	**15% Chrysotile**
221190	1176201-27A Layer A	27	Exterior	Grey Fabric	40% Binder, 60% Cellulose	BDL
221190	1176201-27A Layer B	27	same	Black Fabric	32% Binder, 68% Cellulose	BDL
221190	1176201-27A Layer C	27	same	Black Tar Fabric	85% Binder, 15% Cellulose	BDL
221191	1176201-27B Layer A	27	Exterior	Grey Fabric	40% Binder, 60% Cellulose	BDL
221191	1176201-27B Layer B	27	same	Black Fabric	32% Binder, 68% Cellulose	BDL

POLARIZED LIGHT MICROSCOPY
ANALYTICAL RESULTS

METHOD NUMBER:	EPA/600/R-93/116, July, 1993; 40 CFR, Ch. 1 (7-1-93 ed.), Part 763, Subpart F, Appendix A, pages 293-299
BATCH NUMBER:	2PLM017014, 2PLM017114, 2PLM017214
DATE ANALYZED:	September 29, 2014
ANALYST:	[redacted]

LAB No.	Sample ID	HSA No.	SAMPLE LOCATION	LAYER DESCRIPTION	NON-ASBESTOS COMPONENTS	APPROXIMATE % ASBESTOS
221191	1176201-27B Layer C	27	same	Black Tar Fabric	85% Binder, 15% Cellulose	BDL

TTL associates inc

1915 North 12th St., Toledo, OH 43604-5305; Voice 419-324-2222, Fax 419-241-1808
Ship To Address: ATTN: RECEIVING LAB, 1915 North 12th St., Toledo, OH 43604-5305
Sent From: ☒ Toledo ☐ Plymouth ☐ Detroit ☐ Other _____

Chain of Custody Record

COC 26196 Page 1 of 5

Project No.: 11762-01 Client: ECC/Hardlines
P.O. No.: Project/Location: Cleveland OH
Project Mgr.: [redacted] Sampler's Name [redacted]
Phone No. Sampler's Signat [redacted]

Parameters: RR#4222 MG

Item No.	Sample I.D.	Date Sampled	Time Sampled	Type	Matrix	Sample Location	Total No. of Containers	PLM-Asbestos	Preserved Yes/No	LAB USE ONLY Lab #
1	11762-01-C1A	9/24/14		Bulk	Solid	Along Windows	1	X		221148
2	C1B					"	1	X		221149
3	C2A					External Walls	1	X		221150
4	C2B					" "	1	X		221151
5	C3A					RM 1-13	1	X		221152
6	C3B					" "	1	X		221153
7	C4A					RM 1-7	1	X		221154
8	C4B					Exterior	1	X		221155
9	C5A					RM 1-11	1	X		221156
10	C5B					" "	1	X		221157

Item No.		Date / Time		Date / Time
1-10	[redacted]	9/25/14 1200	[redacted]	9/25/14 1300
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time

LAB USE ONLY

Were samples delivered ☒ in person ☐ by courier
Were samples preserved ☐ in field ☐ in-lab ☒ N/A
Temp of samples NA °C
Did samples arrive intact and sealed? ☒ yes ☐ no ☐ N/A
Were proper containers used? ☒ yes ☐ no
Was container labeled properly for contents? ☒ yes ☐ no
Were samples packaged properly for type of material? ☒ yes ☐ no
Was shipping label completed properly per regulations? (49 CFR 170, etc.) ☐ yes ☐ no
Samples were ☒ accepted ☐ rejected
Comments: _____
TAT STD

Distribution: Original plus one accompanies shipment (white and yellow); copy to coordinator field files (pink)

Rev. 10/08

TTL associates inc

1915 North 12th St., Toledo, OH 43604-5305; Voice 419-324-2222, Fax 419-241-1808
Ship To Address: ATTN: RECEIVING LAB, 1915 North 12th St., Toledo, OH 43604-5305
Sent From: X Toledo ☐ Plymouth ☐ Detroit ☐ Other _____

Chain of Custody Record

WO# 26197 Page 2 of 5

Project No.: 11762.01 Client: ECC / Horsley Witten
P.O. No.: Project/Location: Cleveland OH
Project Mgr.: [redacted] Sampler's Name [redacted]
Phone No. Sampler's Signat [redacted]

Parameters: RK# 4222 MG 9/26/14

Item No.	Sample I.D.	Date Sampled	Time Sampled	Type	Matrix	Sample Location	Total No. of Containers	Filtered Yes/No	Preserved Yes/No	LAB USE ONLY Lab #
1	11762.01-01A	9/24/14		Bulk	Soil	Rm 1-1	1	X		221158
2	01B					" "	1	X		221159
3	01A					Rm 1-12 (Dirt)	1	X		221160
4	01B					" "	1	X		221161
5	08A					Rm 2-1	1	X		221162
6	08B					" "	1	X		221163
7	01A					Rm 2-3	1	X		221164
8	01B					" "	1	X		221165
9	13A					Rm 2-4	1	X		221166
10	13B	↓		↓	↓	" "	1	X		221167

Item No.		Date / Time		Date / Time
[redacted]	[redacted]	9/26/14 1250	[redacted]	9/25/14 1200

Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time

LAB USE ONLY

Were samples delivered: X in person ☐ by courier
Were samples preserved: ☐ in field ☐ in lab X N/A
Temp of samples: N/A °C
Did samples arrive intact and sealed: X yes ☐ no ☐ N/A
Were proper containers used: X yes ☐ no
Was container labeled properly for contents: X yes ☐ no
Were samples packaged properly for type of material: X yes ☐ no
Was shipping label completed properly per regulations? (49 CFR 170, etc.) ☐ yes ☐ no
Samples were X accepted ☐ rejected
Comments: _____

TAT: STD

Distribution: Original plus one accompanies shipment (white and yellow); copy to coordinator field files (pink)

Rev. 10/08

TTL associates inc

1915 North 12th St., Toledo, OH 43604-5305; Voice 419-324-2222, Fax 419-241-1808
Ship To Address: ATTN: RECEIVING LAB, 1915 North 12th St., Toledo, OH 43604-5305
Sent From: ☒ Toledo ☐ Plymouth ☐ Detroit ☐ Other _____

Chain of Custody Record

TTL 26174 Page 3 of 5

Project No.: 11762-01 | Client: ECI / Hoshizaki
P.O. No.: | Project/Location: Cleveland OH
Project Mg [redacted] | Sampler's Name [redacted]
Phone No. | Sampler's Signature

Parameters: RR# 4222

Item No.	Sample I.D.	Date Sampled	Time Sampled	Type	Matrix	Sample Location	Total No. of Containers	Filtered Yes/No	Preserved Yes/No	LAB USE ONLY Lab #
1	11762-01-015A	9/24/14		Bulk	Solid	3rd Fl Wooden Crates	1	X		221168
2	015B					3rd Fl Wooden Crates	1	X		221169
3	015C					" " "	1	X		221170
4	018A					Exterior	1	X		221171
5	018D					Exterior	1	X		221172
6	018C					"	1	X		221173
7	019A					"	1	X		221174
8	019B					"	1	X		221175
9	021A					Exterior	1	X		221176
10	021B					"	1	X		221177

MG 9/26/14

Item No.	[redacted]	Date / Time	[redacted]	Date / Time
20-5		9/25/14 1200		9/25/14 1200
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time

LAB USE ONLY

Were samples delivered ☒ in person ☐ by courier
Were samples preserved ☐ in field ☐ in lab ☒ N/A
Temp of samples N/A °C
Did samples arrive intact and sealed? ☒ yes ☐ no ☐ N/A
Were proper containers used? ☒ yes ☐ no
Was container labeled properly for contents? ☒ yes ☐ no
Were samples packaged properly for type of material? ☒ yes ☐ no
Was shipping label completed properly per regulations? (49 CFR 170, etc.) ☐ yes ☐ no
Samples were ☒ accepted ☐ rejected
Comments: _____

TAT: STD

Distribution: Original plus one accompanies shipment (white and yellow); copy to coordinator field files (pink)

Rev. 10/08

TTL associates inc
1915 North 12th St., Toledo, OH 43604-5305; Voice 419-324-2222, Fax 419-241-1808
Ship To Address: ATTN: RECEIVING LAB, 1915 North 12th St., Toledo, OH 43604-5305
Sent From: ☒ Toledo ☐ Plymouth ☐ Detroit ☐ Other

Chain of Custody Record

TTL # 26173 Page 4 of 5

Project No.: 11762.01 Client: EC / Horsburgh
P.O. No.: Project/Location:
Project Mgr.: [redacted] Sampler's Name [redacted]
Phone No. Sampler's Signature [redacted]

Parameters — RR# 4222

Item No.	Sample I.D.	Date Sampled	Time Sampled	Type	Matrix	Sample Location	Total No. of Containers	Dissolved Pb							Preserved Yes/No	LAB USE ONLY Lab #
																MG 9/26/14
1	11762.01-02IC	9/24/14		Grab	Soil Earth	Exterior	1	X								221178
2	02IA					Exterior	1	X								221179
3	02IB					"	1	X								221180
4	03A					By the Elevator	1	X								221181
5	03B					" "	1	X								221182
6	04A					Rm 1-1	1	X								221183
7	04B					" "	1	X								221184
8	04C					" "	1	X								221185
9	05A					Exterior	1	X								221186
10	05B					"	1	X								221187

Item No.		Date / Time		Date / Time
9-42	[redacted]	9/25/14 1200	[redacted]	9/25/14 1200
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time

LAB USE ONLY

Were samples delivered ☒ in person ☐ by courier
Were samples preserved ☐ in field ☐ in lab ☒ N/A
Temp of samples NA °C
Did samples arrive intact and sealed? ☒ yes ☐ no ☐ N/A
Were proper containers used? ☒ yes ☐ no
Was container labeled properly for contents? ☒ yes ☐ no
Were samples packaged properly for type of material? ☒ yes ☐ no
Was shipping label completed properly per regulations? (49 CFR 170, etc.) ☐ yes ☐ no
Samples were ☒ accepted ☐ rejected
Comments:

TAT STL

Distribution: Original plus one accompanies shipment (white and yellow); copy to coordinator field files (pink)

Rev. 10/08

TTL associates inc

1915 North 12th St., Toledo, OH 43604-5305; Voice 419-324-2222, Fax 419-241-1808
Ship To Address: ATTN: RECEIVING LAB, 1915 North 12th St., Toledo, OH 43604-5305
Sent From: X Toledo ☐ Plymouth ☐ Detroit ☐ Other _____

Chain of Custody Record

NB 26172 Page 5 of 5

Project No.: 11762.01	Client: ECC / Harshaw		
P.O. No.:	Project/Location: Cleveland OH		
Project M[redacted]	Sampler's Name [redacted]		
Phone No.	Sampler's Signatur[redacted]		

Parameters — RR# 4222

Item No.	Sample I.D.	Date Sampled	Time Sampled	Type	Matrix	Sample Location	Total No. of Containers	Preserved Yes/No	LAB USE ONLY Lab #
1	11762.01-02A	9/24/14		Bulk	Solid	Exterior	1		221188
2	02B	↓		↓	↓	"	1		221189
3	02A					Exterior	1		221190
4	02B	↓		↓	↓	"	1		221191
5									
6									
7									
8									
9									
10									

MG 9/26/14

Item No.		Date / Time		Date / Time
[redacted]	[redacted]	9/25/14 1200	[redacted]	9/25/14 1200
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time
Item No.	Relinquished By:	Date / Time	Received By:	Date / Time

LAB USE ONLY

Were samples delivered: X in person ☐ by courier
Were samples preserved: ☐ in field ☐ in lab ☐ N/A
Temp of samples: NA °C
Did samples arrive intact and sealed: X yes ☐ no ☐ N/A
Were proper containers used? X yes ☐ no
Was container labeled properly for contents? X yes ☐ no
Were samples packaged properly for type of material? X yes ☐ no
Was shipping label completed properly per regulations? (49 CFR 170, etc.) ☐ yes ☐ no
Samples were X accepted ☐ rejected
Comments: _____

TAT STD

Distribution: Original plus one accompanies shipment (white and yellow); copy to coordinator field files (pink)

Rev. 10/08

APPENDIX E

X-RAY FLUORESCENCE INSTRUMENT DATA TABLE

Limited Lead Based Paint Inspection
Former Harshaw Chemical Corporation
1000 Harvard Avenue
Cleveland, Ohio

Reading No.	Component	Color	Substrate	Side	Condition	Floor	Room	Time	Units	PbC	PbC Error
17								9/24/2014 9:12	cps	7.4	0
18								9/24/2014 9:16	cps	7.14	0
19	Calibrate							9/24/2014 9:17	mg / cm ^2	0.8	0.2
20	Calibrate							9/24/2014 9:17	mg / cm ^2	0.8	0.2
21	Calibrate							9/24/2014 9:18	mg / cm ^2	1	0.1
22	WALL	WHITE	BRICK	D	NOT INTACT	FIRST	1	9/24/2014 9:29	mg / cm ^2	0.03	0.05
23	WALL	GRAY	BRICK	D	NOT INTACT	FIRST	1	9/24/2014 9:31	mg / cm ^2	0.05	0.05
24	WALL	ORANGE	BRICK	D	NOT INTACT	FIRST	1	9/24/2014 9:32	mg / cm ^2	0.03	0.02
25	WALL	ORANGE	BRICK	A	NOT INTACT	FIRST	1	9/24/2014 9:37	mg / cm ^2	0.08	0.1
26	WALL	GRAY	BRICK	A	NOT INTACT	FIRST	1	9/24/2014 9:38	mg / cm ^2	0.09	0.1
27	WALL	WHITE	BRICK	A	NOT INTACT	FIRST	1	9/24/2014 9:39	mg / cm ^2	0.02	0.06
28	WALL	RED	BRICK	A	NOT INTACT	FIRST	1	9/24/2014 9:39	mg / cm ^2	0.09	0.03
29	WALL	WHITE	CONCRETE	A	NOT INTACT	FIRST	1	9/24/2014 9:41	mg / cm ^2	0.24	0.73
30	WALL	WHITE	BRICK	C	NOT INTACT	FIRST	1	9/24/2014 9:43	mg / cm ^2	0.01	0.02
31	WALL	WHITE	BRICK	C	NOT INTACT	FIRST	1	9/24/2014 9:44	mg / cm ^2	0.03	0.06
32	WALL	GRAY	BRICK	C	NOT INTACT	FIRST	1	9/24/2014 9:45	mg / cm ^2	0.21	0.06
33	WALL	RED	BRICK	C	NOT INTACT	FIRST	1	9/24/2014 9:46	mg / cm ^2	0.09	0.07
34	**WINDOW**	**BROWN**	**WOOD**	**C**	**NOT INTACT**	**FIRST**	**1**	**9/24/2014 9:47**	**mg / cm ^2**	**12.3**	**9**
35	**WINDOW**	**GRAY**	**WOOD**	**A**	**NOT INTACT**	**FIRST**	**1**	**9/24/2014 9:49**	**mg / cm ^2**	**10.2**	**8.1**
36	WINDOW	GRAY	METAL	A	NOT INTACT	FIRST	1	9/24/2014 9:51	mg / cm ^2	0.6	0.3
37	COLUMN	NO PAINT	METAL	A	NOT INTACT	FIRST	1	9/24/2014 9:53	mg / cm ^2	0.05	0.84
38	**COLUMN**	**WHITE**	**METAL**	**A**	**NOT INTACT**	**FIRST**	**1**	**9/24/2014 9:55**	**mg / cm ^2**	**2.8**	**1.7**
39	FLOOR	BROWN	BRICK	A	NOT INTACT	FIRST	1	9/24/2014 9:57	mg / cm ^2	0.12	0.04
40	GUARDING	YELLOW	METAL	A	INTACT	FIRST	1	9/24/2014 9:59	mg / cm ^2	0	0.02
41	DOOR	GRAY	METAL	C	NOT INTACT	FIRST	1	9/24/2014 10:00	mg / cm ^2	0	0.02
42	WALL	WHITE	CONCRETE	C	NOT INTACT	FIRST	1	9/24/2014 10:01	mg / cm ^2	0.04	0.02
43	DOOR	WHITE	METAL	C	NOT INTACT	FIRST	1	9/24/2014 10:02	mg / cm ^2	0	0.02
44	WALL	WHITE	BRICK	B	NOT INTACT	FIRST	1	9/24/2014 10:05	mg / cm ^2	0.7	0.1
45	**WALL**	**GRAY**	**BRICK**	**B**	**NOT INTACT**	**FIRST**	**1**	**9/24/2014 10:06**	**mg / cm ^2**	**1.9**	**0.9**
46	FLOOR	GRAY	BRICK	B	INTACT	FIRST	1	9/24/2014 10:07	mg / cm ^2	0.19	0.11
47	FLOOR	YELLOW	CONCRETE	B	INTACT	FIRST	1	9/24/2014 10:07	mg / cm ^2	0.07	0.06
48	FLOOR	YELLOW	CONCRETE	B	INTACT	FIRST	1	9/24/2014 10:07	mg / cm ^2	0.08	0.07
49	**DOOR**	**TAN**	**METAL**	**A**	**NOT INTACT**	**FIRST**	**1**	**9/24/2014 10:12**	**mg / cm ^2**	**14**	**9.7**
50	DOOR	TAN	WOOD	D	NOT INTACT	FIRST	1	9/24/2014 10:14	mg / cm ^2	0.11	0.12
51	DOOR	TAN	WOOD	D	NOT INTACT	STAIRWELL	STAIRWELL	9/24/2014 10:15	mg / cm ^2	0.6	0.2
52	DOOR	TAN	WOOD	D	NOT INTACT	STAIRWELL	STAIRWELL	9/24/2014 10:15	mg / cm ^2	0.4	0.5
53	**DOOR**	**TAN**	**METAL**	**B**	**NOT INTACT**	**STAIRWELL**	**STAIRWELL**	**9/24/2014 10:16**	**mg / cm ^2**	**9.3**	**8.3**
54	WALL	WHITE	METAL	C	NOT INTACT	STAIRWELL	STAIRWELL	9/24/2014 10:18	mg / cm ^2	0.08	0.12
55	WALL	WHITE	METAL	C	NOT INTACT	STAIRWELL	STAIRWELL	9/24/2014 10:18	mg / cm ^2	0.5	0.5

Reading No.	Component	Color	Substrate	Side	Condition	Floor	Room	Time	Units	PbC	PbC Error
56	STAIR RUNNER	GRAY	METAL	D	NOT INTACT	STAIRWELL	STAIRWELL	9/24/2014 10:21	mg / cm ^2	0.1	0.06
57	WALL	WHITE	BRICK	A	NOT INTACT	FIRST	3	9/24/2014 10:28	mg / cm ^2	0.01	0.02
58	WALL	WHITE	BRICK	B	NOT INTACT	FIRST	3	9/24/2014 10:29	mg / cm ^2	0.05	0.05
59	WALL	WHITE	BRICK	C	NOT INTACT	FIRST	3	9/24/2014 10:29	mg / cm ^2	0.06	0.04
60	WALL	WHITE	BRICK	D	NOT INTACT	FIRST	3	9/24/2014 10:30	mg / cm ^2	0.21	0.73
61	WALL	GREEN	BRICK	D	NOT INTACT	FIRST	3	9/24/2014 10:30	mg / cm ^2	0.5	0.5
62	DRIER	YELLOW	METAL	A	INTACT	FIRST	3	9/24/2014 10:31	mg / cm ^2	0.09	0.17
63	WASHER	WHITE	METAL	A	INTACT	FIRST	3	9/24/2014 10:32	mg / cm ^2	0	0.02
64	TANK STAND	BLACK	METAL	A	INTACT	FIRST	3	9/24/2014 10:33	mg / cm ^2	0	0.02
65	DOOR	GRAY	WOOD	C	INTACT	FIRST	3	9/24/2014 10:34	mg / cm ^2	0	0.02
66	**FLOOR**	**GRAY**	**CONCRETE**	**A**	**NOT INTACT**	**FIRST**	**3**	**9/24/2014 10:35**	**mg / cm ^2**	**1.4**	**0.4**
67	DRUM	RED	METAL	C	NOT INTACT	FIRST	3	9/24/2014 10:39	mg / cm ^2	0	0.02
68	DRUM	GRAY	METAL	C	NOT INTACT	FIRST	3	9/24/2014 10:40	mg / cm ^2	0.01	0.04
69	**DOOR FRAME**	**BROWN**	**WOOD**	**A**	**NOT INTACT**	**FIRST**	**3**	**9/24/2014 10:41**	**mg / cm ^2**	**4.8**	**2.6**
70	DOOR FRAME	GRAY	METAL	D	INTACT	FIRST	2	9/24/2014 10:44	mg / cm ^2	0	0.02
71	DOOR FRAME	GRAY	METAL	A	INTACT	FIRST	2	9/24/2014 10:45	mg / cm ^2	0.01	0.06
72	DOOR	GRAY	METAL	A	INTACT	FIRST	2	9/24/2014 10:45	mg / cm ^2	0	0.02
73	DOOR	GRAY	METAL	D	INTACT	FIRST	2	9/24/2014 10:46	mg / cm ^2	0.02	0.12
74	WALL	RED	BRICK	C	NOT INTACT	FIRST	4	9/24/2014 10:49	mg / cm ^2	0.07	0.04
75	WALL	WHITE	BRICK	C	NOT INTACT	FIRST	4	9/24/2014 10:50	mg / cm ^2	0.01	0.02
76	**WALL**	**WHITE**	**BRICK**	**B**	**NOT INTACT**	**FIRST**	**4**	**9/24/2014 10:52**	**mg / cm ^2**	**4**	**2.6**
77	**WALL**	**BLUE**	**BRICK**	**C**	**NOT INTACT**	**FIRST**	**4**	**9/24/2014 10:52**	**mg / cm ^2**	**2.9**	**1.3**
78	DOOR	GRAY	WOOD	B	NOT INTACT	FIRST	4	9/24/2014 10:54	mg / cm ^2	0.06	0.1
79	**DOOR FRAME**	**GRAY**	**WOOD**	**B**	**NOT INTACT**	**FIRST**	**4**	**9/24/2014 10:55**	**mg / cm ^2**	**1.8**	**0.5**
80	WINDOW FRAME	WHITE	METAL	B	NOT INTACT	FIRST	4	9/24/2014 10:56	mg / cm ^2	0.6	0.3
81	**DOOR**	**GRAY**	**WOOD**	**A**	**NOT INTACT**	**FIRST**	**4**	**9/24/2014 10:58**	**mg / cm ^2**	**2.5**	**1.3**
82	COLUMN	WHITE	METAL	C	NOT INTACT	FIRST	4	9/24/2014 11:00	mg / cm ^2	0	0.02
83	FLOOR	GRAY	CONCRETE	C	INTACT	FIRST	4	9/24/2014 11:01	mg / cm ^2	0.02	0.08
84	**DOOR**	**BLUE**	**WOOD**	**A**	**INTACT**	**FIRST**	**4**	**9/24/2014 11:03**	**mg / cm ^2**	**1.4**	**0.3**
85	**DOOR**	**GRAY**	**WOOD**	**C**	**INTACT**	**FIRST**	**5**	**9/24/2014 11:04**	**mg / cm ^2**	**8.2**	**7**
86	WALL	WHITE	CONCRETE	C	INTACT	FIRST	5	9/24/2014 11:05	mg / cm ^2	0.03	0.02
87	WALL	WHITE	CONCRETE	A	INTACT	FIRST	5	9/24/2014 11:06	mg / cm ^2	0.05	0.02
88	WALL	WHITE	CONCRETE	D	INTACT	FIRST	5	9/24/2014 11:07	mg / cm ^2	0.01	0.02
89	WALL	WHITE	CONCRETE	D	INTACT	FIRST	5	9/24/2014 11:08	mg / cm ^2	0.07	0.04
90	COLUMN	WHITE	METAL	D	INTACT	FIRST	5	9/24/2014 11:09	mg / cm ^2	0.13	0.21
91	COLUMN	WHITE	METAL	D	INTACT	FIRST	5	9/24/2014 11:09	mg / cm ^2	0.14	0.15
92	DOOR	BLUE	WOOD	D	NOT INTACT	FIRST	5	9/24/2014 11:11	mg / cm ^2	0.04	0.1
93	DOOR	GREEN	WOOD	D	NOT INTACT	FIRST	5	9/24/2014 11:11	mg / cm ^2	0.7	0.2
94	FLOOR	GRAY	CONCRETE	B	NOT INTACT	FIRST	6	9/24/2014 11:16	mg / cm ^2	0.02	0.03

Reading No.	Component	Color	Substrate	Side	Condition	Floor	Room	Time	Units	PbC	PbC Error
95	WALL	WHITE	BRICK	B	NOT INTACT	FIRST	6	9/24/2014 11:17	mg / cm ^2	0.24	0.1
96	COLUMN	WHITE	METAL	B	NOT INTACT	FIRST	6	9/24/2014 11:19	mg / cm ^2	0.02	0.04
97	COLUMN	WHITE	METAL	D	NOT INTACT	FIRST	6	9/24/2014 11:19	mg / cm ^2	0.19	0.25
98	**COLUMN**	**BROWN**	**WOOD**	**C**	**NOT INTACT**	**FIRST**	**6**	**9/24/2014 11:20**	**mg / cm ^2**	**6**	**3.1**
99	WINDOW FRAME	WHITE	METAL	D	NOT INTACT	FIRST	6	9/24/2014 11:24	mg / cm ^2	0.09	0.11
100	DOOR FRAME	GRAY	WOOD	A	NOT INTACT	FIRST	6	9/24/2014 11:27	mg / cm ^2	0	0.02
101	DOOR FRAME	GRAY	WOOD	C	NOT INTACT	FIRST	7	9/24/2014 11:31	mg / cm ^2	0.02	0.11
102	DOOR	BLUE	WOOD	C	NOT INTACT	FIRST	7	9/24/2014 11:32	mg / cm ^2	0.3	0.18
103	FREIGHT ELEVATOR DOOR	BLUE	METAL	D	NOT INTACT	FIRST	7	9/24/2014 11:34	mg / cm ^2	0.14	0.2
104	COLUMN	GRAY	CONCRETE	D	NOT INTACT	FIRST	7	9/24/2014 11:35	mg / cm ^2	0	0.02
105	COLUMN	GRAY	CONCRETE	D	NOT INTACT	FIRST	7	9/24/2014 11:36	mg / cm ^2	0	0.02
106	WALL	GRAY	CONCRETE	C	NOT INTACT	FIRST	7	9/24/2014 11:36	mg / cm ^2	0.02	0.02
107	WALL	WHITE	CONCRETE	C	NOT INTACT	FIRST	7	9/24/2014 11:37	mg / cm ^2	0.03	0.02
108	DOOR	GREEN	WOOD	B	NOT INTACT	FIRST	7	9/24/2014 11:39	mg / cm ^2	0.05	0.11
109	DOOR FRAME	GRAY	WOOD	B	NOT INTACT	FIRST	7	9/24/2014 11:40	mg / cm ^2	0.04	0.09
110	FRAME BY ELEVATOR	YELLOW	METAL	C	INTACT	FIRST	7	9/24/2014 11:43	mg / cm ^2	0	0.02
111	DOOR	GRAY	WOOD	A	INTACT	FIRST	7	9/24/2014 11:45	mg / cm ^2	0.05	0.11
112	WALL	GRAY	WOOD	A	NOT INTACT	FIRST	7	9/24/2014 11:46	mg / cm ^2	0.04	0.14
113	**WALL**	**GRAY**	**CONCRETE**	**D**	**NOT INTACT**	**FIRST**	**7**	**9/24/2014 11:47**	**mg / cm ^2**	**2.4**	**1.4**
114	WALL	WHITE	CONCRETE	D	NOT INTACT	FIRST	7	9/24/2014 11:47	mg / cm ^2	0.03	0.03
115	STAIR CASE	BROWN	METAL	D	NOT INTACT	FIRST	7	9/24/2014 11:49	mg / cm ^2	0.05	0.09
116	**DOOR**	**BLACK**	**WOOD**	**C**	**NOT INTACT**	**FIRST**	**7**	**9/24/2014 11:50**	**mg / cm ^2**	**2.4**	**1**
117	**HAND RAIL**	**BLACK**	**METAL**	**A**	**NOT INTACT**	**FIRST**	**7**	**9/24/2014 11:52**	**mg / cm ^2**	**1.8**	**0.7**
118	DOORFRAME	YELLOW	WOOD	A	INTACT	FIRST	7	9/24/2014 11:53	mg / cm ^2	0.05	0.11
119	FLOOR	YELLOW	CONCRETE	A	NOT INTACT	FIRST	7	9/24/2014 11:55	mg / cm ^2	0.04	0.05
120	WALL	RED	CONCRETE	C	NOT INTACT	FIRST	8	9/24/2014 12:00	mg / cm ^2	0.14	0.05
121	WALL	WHITE	CONCRETE	C	NOT INTACT	FIRST	8	9/24/2014 12:00	mg / cm ^2	0.4	0.6
122	WALL	WHITE	BRICK	C	NOT INTACT	FIRST	8	9/24/2014 12:01	mg / cm ^2	0.04	0.03
123	WALL	WHITE	BRICK	C	NOT INTACT	FIRST	8	9/24/2014 12:02	mg / cm ^2	0.27	0.07
124	COLUMN	BLACK	METAL	A	NOT INTACT	FIRST	8	9/24/2014 12:03	mg / cm ^2	0.01	0.04
125	COLUMN	BLACK	METAL	A	NOT INTACT	FIRST	8	9/24/2014 12:04	mg / cm ^2	0.08	0.18
126	**WALL**	**GREEN**	**CONCRETE**	**C**	**NOT INTACT**	**FIRST**	**8**	**9/24/2014 12:05**	**mg / cm ^2**	**2**	**0.8**
127	DOOR	GRAY	WOOD	C	NOT INTACT	FIRST	8	9/24/2014 12:06	mg / cm ^2	0.04	0.08
128	DOOR	GRAY	WOOD	C	NOT INTACT	FIRST	8	9/24/2014 12:06	mg / cm ^2	0.07	0.23
129	COLUMN	WHITE	METAL	C	NOT INTACT	FIRST	8	9/24/2014 12:07	mg / cm ^2	0.03	0.08
130	WALL	WHITE	CONCRETE	A	NOT INTACT	FIRST	9	9/24/2014 12:10	mg / cm ^2	0.6	0.4
131	WALL	GRAY	CONCRETE	A	NOT INTACT	FIRST	9	9/24/2014 12:10	mg / cm ^2	0	0.02
132	WALL	GRAY	CONCRETE	A	NOT INTACT	FIRST	9	9/24/2014 12:11	mg / cm ^2	0	0.02
133	WALL	GRAY	CONCRETE	A	NOT INTACT	FIRST	9	9/24/2014 12:11	mg / cm ^2	0.01	0.02

Reading No.	Component	Color	Substrate	Side	Condition	Floor	Room	Time	Units	PbC	PbC Error
134	WINDOW FRAME	RED	METAL	D	NOT INTACT	FIRST	9	9/24/2014 12:12	mg / cm ^2	0.05	0.03
135	WINDOW FRAME	RED	METAL	D	NOT INTACT	FIRST	9	9/24/2014 12:12	mg / cm ^2	0.03	0.08
136	DOOR	GRAY	WOOD	A	NOT INTACT	FIRST	9	9/24/2014 12:13	mg / cm ^2	0	0.03
137	DOOR	GRAY	WOOD	A	NOT INTACT	FIRST	9	9/24/2014 12:13	mg / cm ^2	0	0.03
138	DOOR FRAME	GRAY	WOOD	A	NOT INTACT	FIRST	9	9/24/2014 12:14	mg / cm ^2	0	0.03
139	DOOR FRAME	GREEN	WOOD	B	NOT INTACT	FIRST	10	9/24/2014 12:15	mg / cm ^2	0.8	0.2
140	DOOR	GREEN	WOOD	B	NOT INTACT	FIRST	10	9/24/2014 12:16	mg / cm ^2	0.8	0.2
141	WALL	WHITE	CONCRETE	B	NOT INTACT	FIRST	10	9/24/2014 12:16	mg / cm ^2	0.04	0.04
142	WALL	WHITE	CONCRETE BRICK	B	NOT INTACT	FIRST	10	9/24/2014 12:17	mg / cm ^2	0.02	0.02
143	WALL	GREEN	CONCRETE	D	NOT INTACT	FIRST	10	9/24/2014 12:17	mg / cm ^2	0.5	0.4
144	COLUMN	YELLOW	METAL	A	NOT INTACT	FIRST	10	9/24/2014 12:18	mg / cm ^2	0.19	0.21
145	DOOR	GREEN	WOOD	D	NOT INTACT	FIRST	11	9/24/2014 12:21	mg / cm ^2	0.8	0.1
146	WALL	WHITE	BRICK	D	NOT INTACT	FIRST	11	9/24/2014 12:22	mg / cm ^2	0.01	0.02
147	WALL	WHITE	BRICK	A	NOT INTACT	FIRST	11	9/24/2014 12:22	mg / cm ^2	0.02	0.05
148	BRACKET ON WALL	GRAY	METAL	B	NOT INTACT	FIRST	11	9/24/2014 12:25	mg / cm ^2	0.01	0.07
149	BRACKET ON WALL	GRAY	METAL	B	NOT INTACT	FIRST	11	9/24/2014 12:25	mg / cm ^2	0	0.02
150	FRAMING	GRAY	METAL	D	NOT INTACT	FIRST	11	9/24/2014 12:26	mg / cm ^2	0.01	0.05
151	FLOOR LOFT AREA	TEAL	WOOD	D	NOT INTACT	FIRST	11	9/24/2014 12:27	mg / cm ^2	0.6	0.3
152	FLOOR	GRAY	CONCRETE	D	NOT INTACT	FIRST	11	9/24/2014 12:28	mg / cm ^2	0.01	0.03
153	FLOOR LOFT AREA	WHITE	WOOD	A	INTACT	FIRST	11	9/24/2014 12:38	mg / cm ^2	0.01	0.05
154	**DOOR**	**GRAY**	**WOOD**	**A**	**INTACT**	**FIRST**	**12**	**9/24/2014 12:40**	**mg / cm ^2**	**1.1**	**0.1**
155	**DOOR**	**GRAY**	**WOOD**	**A**	**INTACT**	**FIRST**	**12**	**9/24/2014 12:40**	**mg / cm ^2**	**1.2**	**0.2**
156	**WALL**	**WHITE**	**CONCRETE**	**A**	**INTACT**	**FIRST**	**12**	**9/24/2014 12:41**	**mg / cm ^2**	**1.5**	**0.5**
157	WALL	WHITE	BRICK	C	NOT INTACT	FIRST	12	9/24/2014 12:42	mg / cm ^2	0.06	0.07
158	WALL	BLACK	BRICK	C	NOT INTACT	FIRST	12	9/24/2014 12:42	mg / cm ^2	0.07	0.03
159	COLUMN	YELLOW	METAL	A	NOT INTACT	FIRST	12	9/24/2014 12:43	mg / cm ^2	0.09	0.17
160	COLUMN	GREEN	METAL	A	NOT INTACT	FIRST	13	9/24/2014 14:16	mg / cm ^2	0.06	0.13
161	COLUMN	WHITE	METAL	A	NOT INTACT	FIRST	13	9/24/2014 14:18	mg / cm ^2	0.08	0.26
162	**DOOR**	**GRAY**	**WOOD**	**A**	**NOT INTACT**	**FIRST**	**13**	**9/24/2014 14:19**	**mg / cm ^2**	**1.6**	**0.6**
163	**DOOR**	**WHITE**	**METAL**	**A**	**NOT INTACT**	**FIRST**	**13**	**9/24/2014 14:20**	**mg / cm ^2**	**2.4**	**1.3**
164	COLUMN	WHITE	METAL	B	NOT INTACT	MEZZANINE	13	9/24/2014 14:23	mg / cm ^2	0.13	0.19
165	WALL	WHITE	BRICK	B	NOT INTACT	MEZZANINE	13	9/24/2014 14:24	mg / cm ^2	0.17	0.06
166	FLOOR	WHITE	CONCRETE	B	NOT INTACT	MEZZANINE	13	9/24/2014 14:25	mg / cm ^2	0.03	0.02
167	WALL	YELLOW	CONCRETE	D	NOT INTACT	MEZZANINE	14	9/24/2014 14:29	mg / cm ^2	0.07	0.02
168	WALL	YELLOW	CONCRETE	D	NOT INTACT	MEZZANINE	14	9/24/2014 14:30	mg / cm ^2	0.07	0.04
169	WALL GLAZED BLOCK	YELLOW	CONCRETE	B	NOT INTACT	MEZZANINE	14	9/24/2014 14:31	mg / cm ^2	0	0.02
170	WALL GLAZED BLOCK	YELLOW	DRYWALL	C	NOT INTACT	MEZZANINE	14	9/24/2014 14:32	mg / cm ^2	0.11	0.28
171	**DOOR**	**YELLOW**	**WOOD**	**D**	**NOT INTACT**	**MEZZANINE**	**14**	**9/24/2014 14:34**	**mg / cm ^2**	**2**	**0.9**
172	**DOOR**	**YELLOW**	**WOOD**	**B**	**NOT INTACT**	**MEZZANINE**	**15**	**9/24/2014 14:35**	**mg / cm ^2**	**2.1**	**1**

Reading No.	Component	Color	Substrate	Side	Condition	Floor	Room	Time	Units	PbC	PbC Error
173	WALL	WHITE	CONCRETE	B	NOT INTACT	MEZZANINE	15	9/24/2014 14:35	mg / cm ^2	0.3	0.59
174	FRAME	BROWN	METAL	C	NOT INTACT	MEZZANINE	15	9/24/2014 14:37	mg / cm ^2	0.02	0.07
175	**DOOR**	**GRAY**	**WOOD**	**D**	**NOT INTACT**	**MEZZANINE**	**15**	**9/24/2014 14:38**	**mg / cm ^2**	**1.9**	**0.7**
176	COLUMN	BLACK	METAL	C	NOT INTACT	MEZZANINE	16	9/24/2014 14:39	mg / cm ^2	0.02	0.07
177	WALL	WHITE	BRICK	A	NOT INTACT	MEZZANINE	16	9/24/2014 14:40	mg / cm ^2	0.02	0.02
178	DOOR	GRAY	WOOD	A	NOT INTACT	MEZZANINE	17	9/24/2014 14:46	mg / cm ^2	0.02	0.05
179	CERAMIC BLOCK WALL	WHITE	CONCRETE	D	NOT INTACT	MEZZANINE	17	9/24/2014 14:48	mg / cm ^2	0	0.02
180	BATHROOM PARTITION	GRAY	METAL	D	NOT INTACT	MEZZANINE	17	9/24/2014 14:49	mg / cm ^2	0.02	0.06
181	DOOR	GRAY	WOOD	A	NOT INTACT	MEZZANINE	17	9/24/2014 14:50	mg / cm ^2	0.02	0.04
182	DOOR	GRAY	WOOD	B	NOT INTACT	MEZZANINE	17	9/24/2014 14:50	mg / cm ^2	0.03	0.06
183	WALL	YELLOW	BRICK	B	NOT INTACT	MEZZANINE	17	9/24/2014 14:52	mg / cm ^2	0.05	0.02
184	TURNSTILE	WHITE	METAL	A	NOT INTACT	MEZZANINE	17	9/24/2014 14:54	mg / cm ^2	0.01	0.07
185	SHELVES	GREEN	WOOD	D	NOT INTACT	FIRST	18	9/24/2014 14:57	mg / cm ^2	0.4	0.3
186	**DOOR**	**GRAY**	**WOOD**	**D**	**NOT INTACT**	**FIRST**	**18**	**9/24/2014 14:58**	**mg / cm ^2**	**2.8**	**1.7**
187	DOOR	GRAY	WOOD	C	NOT INTACT	FIRST	18	9/24/2014 14:58	mg / cm ^2	0.19	0.22
188	**WALL**	**GRAY**	**CONCRETE**	**C**	**NOT INTACT**	**FIRST**	**18**	**9/24/2014 14:59**	**mg / cm ^2**	**2.6**	**1.5**
189	WALL	WHITE	CONCRETE	C	NOT INTACT	FIRST	18	9/24/2014 15:00	mg / cm ^2	0.7	0.3
190	WALL	GREEN	BRICK	D	NOT INTACT	FIRST	18	9/24/2014 15:01	mg / cm ^2	0.03	0.02
191	WALL	WHITE	BRICK	B	NOT INTACT	FIRST	19	9/24/2014 15:05	mg / cm ^2	0.17	0.03
192	WALL	WHITE	BRICK	B	NOT INTACT	FIRST	19	9/24/2014 15:05	mg / cm ^2	0.07	0.08
193	**COLUMN**	**GREEN**	**METAL**	**B**	**NOT INTACT**	**FIRST**	**19**	**9/24/2014 15:06**	**mg / cm ^2**	**2.3**	**1.5**
194	**COLUMN**	**GREEN**	**METAL**	**B**	**NOT INTACT**	**FIRST**	**19**	**9/24/2014 15:07**	**mg / cm ^2**	**5**	**3.3**
195	DOOR	GRAY	WOOD	B	NOT INTACT	FIRST	19	9/24/2014 15:08	mg / cm ^2	0	0.02
196	DOOR	GRAY	WOOD	A	NOT INTACT	FIRST	19	9/24/2014 15:09	mg / cm ^2	0.12	0.22
197	STAIRS	GRAY	METAL	A	NOT INTACT	FIRST	19	9/24/2014 15:09	mg / cm ^2	0.25	0.14
198	HAND RAIL	GRAY	METAL	A	NOT INTACT	SECOND	20	9/24/2014 15:11	mg / cm ^2	0.4	0.2
199	**COLUMN**	**GRAY**	**METAL**	**A**	**NOT INTACT**	**SECOND**	**20**	**9/24/2014 15:11**	**mg / cm ^2**	**3.7**	**2.1**
200	WALL	WHITE	BRICK	D	NOT INTACT	SECOND	20	9/24/2014 15:13	mg / cm ^2	0.3	0.68
201	WALL	WHITE	BRICK	A	NOT INTACT	THIRD	21	9/24/2014 15:17	mg / cm ^2	0.14	0.06
202	**DOOR**	**WHITE**	**METAL**	**B**	**NOT INTACT**	**THIRD**	**21**	**9/24/2014 15:18**	**mg / cm ^2**	**4.2**	**2.4**
203	**COLUMN**	**GRAY**	**METAL**	**B**	**NOT INTACT**	**THIRD**	**21**	**9/24/2014 15:18**	**mg / cm ^2**	**3.8**	**2.3**
204	DOOR	GRAY	WOOD	A	NOT INTACT	THIRD	21	9/24/2014 15:21	mg / cm ^2	0.02	0.06
205	DOOR	GRAY	WOOD	A	NOT INTACT	THIRD	21	9/24/2014 15:21	mg / cm ^2	0.04	0.08
206	WALL	GRAY	BRICK	A	NOT INTACT	SECOND	22	9/24/2014 15:39	mg / cm ^2	0.01	0.02
207	WALL	GRAY	BRICK	A	NOT INTACT	SECOND	22	9/24/2014 15:39	mg / cm ^2	0.04	0.07
208	WALL	WHITE	BRICK	A	NOT INTACT	SECOND	22	9/24/2014 15:40	mg / cm ^2	0.03	0.05
209	**COLUMN**	**WHITE**	**METAL**	**A**	**NOT INTACT**	**SECOND**	**22**	**9/24/2014 15:40**	**mg / cm ^2**	**2**	**1**
210	DOOR	GRAY	WOOD	D	NOT INTACT	SECOND	22	9/24/2014 15:41	mg / cm ^2	0.12	0.22
211	DOOR	GRAY	WOOD	C	NOT INTACT	SECOND	22	9/24/2014 15:42	mg / cm ^2	0.12	0.16

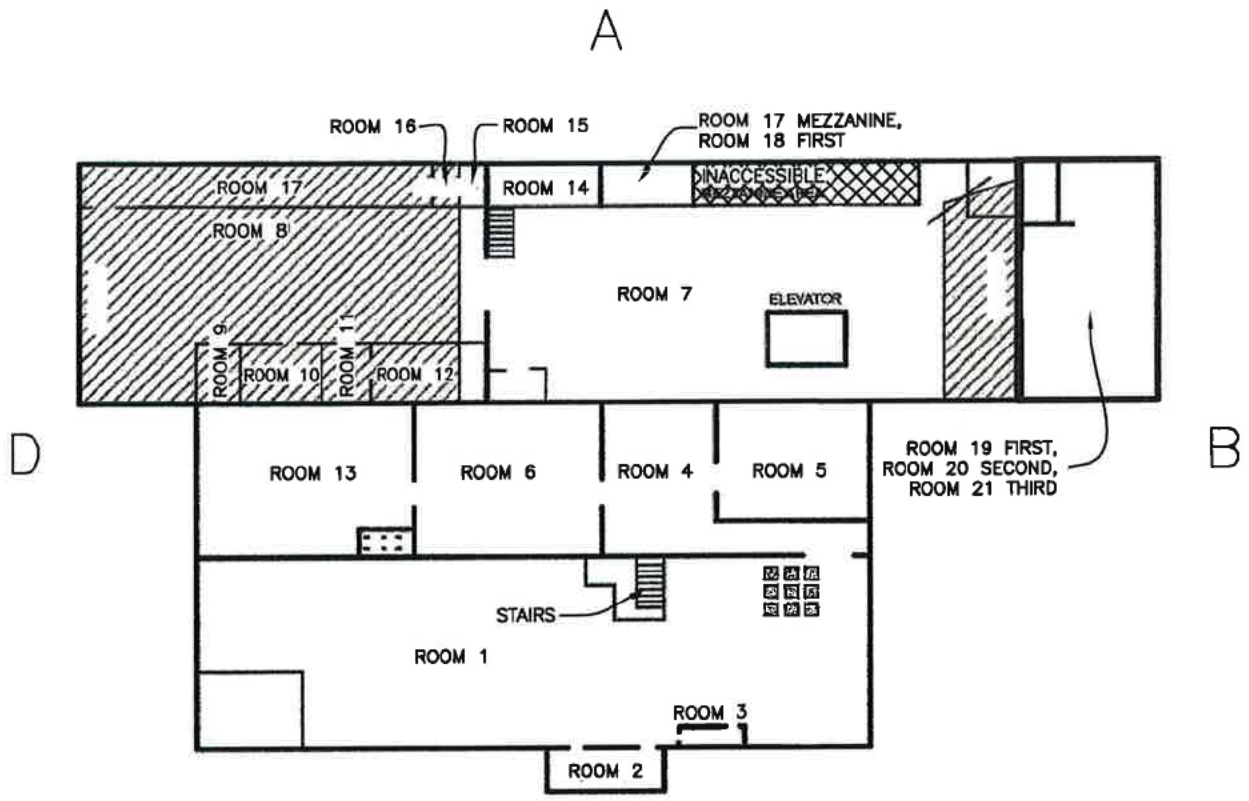
Reading No.	Component	Color	Substrate	Side	Condition	Floor	Room	Time	Units	PbC	PbC Error
212	WALL	RED	BRICK	D	NOT INTACT	SECOND	22	9/24/2014 15:44	mg / cm ^2	0.23	0.09
213	WALL	BLUE	BRICK	D	NOT INTACT	SECOND	23	9/24/2014 15:45	mg / cm ^2	0.27	0.06
214	WALL	BEIGE	BRICK	D	NOT INTACT	SECOND	23	9/24/2014 15:46	mg / cm ^2	0.5	0.4
215	DOOR	GREEN	WOOD	A	NOT INTACT	SECOND	23	9/24/2014 15:46	mg / cm ^2	0.01	0.08
216	DOOR	BLUE	WOOD	C	NOT INTACT	SECOND	24	9/24/2014 15:48	mg / cm ^2	0	0.02
217	DOOR	BLUE	WOOD	C	NOT INTACT	SECOND	24	9/24/2014 15:48	mg / cm ^2	0.01	0.04
218	WALL	BLUE	BRICK	B	NOT INTACT	SECOND	24	9/24/2014 15:49	mg / cm ^2	0	0.02
219	WALL	WHITE	BRICK	B	NOT INTACT	SECOND	24	9/24/2014 15:50	mg / cm ^2	0.3	0.22
220	COLUMN	WHITE	METAL	B	NOT INTACT	SECOND	24	9/24/2014 15:52	mg / cm ^2	0.04	0.15
221	RISER PIPE	WHITE	METAL	A	NOT INTACT	SECOND	24	9/24/2014 15:54	mg / cm ^2	0	0.02
222	WINDOW FRAME	WHITE	METAL	A	NOT INTACT	SECOND	24	9/24/2014 15:54	mg / cm ^2	0.01	0.03
223	**WALL**	**BLUE**	**CONCRETE**	**B**	**NOT INTACT**	**SECOND**	**24**	**9/24/2014 15:55**	**mg / cm ^2**	**4.6**	**3.4**
224	DOOR	BLUE	WOOD	B	NOT INTACT	SECOND	24	9/24/2014 15:55	mg / cm ^2	0.19	0.6
225	DOOR FRAME	GREEN	WOOD	D	NOT INTACT	SECOND	25	9/24/2014 15:56	mg / cm ^2	0.09	0.13
226	WALL	BLUE	CONCRETE	D	NOT INTACT	SECOND	25	9/24/2014 15:59	mg / cm ^2	0.5	0.1
227	WALL	BLUE	CONCRETE	A	NOT INTACT	SECOND	25	9/24/2014 15:59	mg / cm ^2	0.23	0.06
228	SHELVES	BLUE	WOOD	B	INTACT	SECOND	25	9/24/2014 16:00	mg / cm ^2	0.26	0.23
229	PADS	BLACK	CONCRETE	B	INTACT	SECOND	25	9/24/2014 16:01	mg / cm ^2	0.12	0.17
230	DOOR	BEIGE	WOOD	C	NOT INTACT	SECOND	25	9/24/2014 16:02	mg / cm ^2	0.4	0.3
231	DOOR	BROWN	WOOD	A	NOT INTACT	SECOND	26	9/24/2014 16:03	mg / cm ^2	0	0.02
232	DOOR	GRAY	WOOD	A	NOT INTACT	SECOND	26	9/24/2014 16:03	mg / cm ^2	0.4	0.4
233	COLUMN	BEIGE	METAL	A	NOT INTACT	SECOND	26	9/24/2014 16:04	mg / cm ^2	0.03	0.07
234	WALL	BEIGE	CONCRETE	D	NOT INTACT	SECOND	26	9/24/2014 16:05	mg / cm ^2	0.04	0.03
235	**WALL**	**GRAY**	**CONCRETE**	**D**	**NOT INTACT**	**SECOND**	**26**	**9/24/2014 16:05**	**mg / cm ^2**	**1.8**	**0.5**
236	DOOR ELEVATOR	GRAY	METAL	B	NOT INTACT	SECOND	26	9/24/2014 16:06	mg / cm ^2	0.4	0.4
237	SLOP SINK	GRAY	METAL	D	NOT INTACT	SECOND	26	9/24/2014 16:07	mg / cm ^2	0.9	0.1
238	**SLOP SINK**	**GRAY**	**CONCRETE**	**D**	**NOT INTACT**	**SECOND**	**26**	**9/24/2014 16:08**	**mg / cm ^2**	**1**	**0.1**
239	DOOR	GRAY	METAL	C	NOT INTACT	SECOND	26	9/24/2014 16:10	mg / cm ^2	0	0.02
240	WALL	GRAY	BRICK	C	NOT INTACT	SECOND	26	9/24/2014 16:11	mg / cm ^2	0	0.02
241	WALL	GRAY	BRICK	C	NOT INTACT	SECOND	26	9/24/2014 16:12	mg / cm ^2	0	0.02
242	WALL	GRAY	BRICK	B	NOT INTACT	SECOND	26	9/24/2014 16:12	mg / cm ^2	0	0.02
243	WINDOW FRAME	BEIGE	METAL	B	NOT INTACT	SECOND	26	9/24/2014 16:13	mg / cm ^2	0	0.02
244	COLUMN	BEIGE	METAL	A	NOT INTACT	SECOND	26	9/24/2014 16:13	mg / cm ^2	0.01	0.02
245	COLUMN	RED	METAL	A	NOT INTACT	SECOND	27	9/24/2014 16:14	mg / cm ^2	0.02	0.09
246	DOOR	GRAY	WOOD	C	NOT INTACT	SECOND	27	9/24/2014 16:54	mg / cm ^2	0.08	0.12
247	DOOR	WHITE	WOOD	C	NOT INTACT	SECOND	27	9/24/2014 16:54	mg / cm ^2	0.11	0.19
248	WINDOW BOARD OVER OPENING	GRAY	WOOD	C	INTACT	SECOND	27	9/24/2014 16:56	mg / cm ^2	0	0.02
249	DOOR	GRAY	WOOD	C	NOT INTACT	SECOND	27	9/24/2014 16:56	mg / cm ^2	0	0.02
250	BRACKET	WHITE	METAL	C	NOT INTACT	SECOND	27	9/24/2014 16:57	mg / cm ^2	0.01	0.04

Limited Lead Based Paint Inspection
Former Harshaw Chemical Corporation
1000 Harvard Avenue
Cleveland, Ohio

Reading No.	Component	Color	Substrate	Side	Condition	Floor	Room	Time	Units	PbC	PbC Error
251	BRACKET	GRAY	METAL	C	NOT INTACT	SECOND	27	9/24/2014 16:57	mg / cm ^2	0	0.02
252	TIE LINE BOX	GRAY	METAL	C	NOT INTACT	SECOND	27	9/24/2014 16:58	mg / cm ^2	0	0.02
253	TIE LINE BOX	GRAY	METAL	C	NOT INTACT	SECOND	27	9/24/2014 16:58	mg / cm ^2	0.02	0.12
254	TIE LINE BOX	GRAY	METAL	C	NOT INTACT	SECOND	27	9/24/2014 16:58	mg / cm ^2	0	0.03
255	WINDOW BOARD OVER	GRAY	WOOD	C	INTACT	SECOND	27	9/24/2014 17:01	mg / cm ^2	0	0.02
256	WINDOW BOARD OVER	GRAY	WOOD	B	INTACT	SECOND	27	9/24/2014 17:01	mg / cm ^2	0	0.02
257	DOOR	RED	METAL	B	NOT INTACT	SECOND	27	9/24/2014 17:02	mg / cm ^2	0.03	0.13
258	WALL	BEIGE	BRICK	A	NOT INTACT	SECOND	27	9/24/2014 17:05	mg / cm ^2	0.01	0.02
259	WALL	BLACK	BRICK	A	NOT INTACT	SECOND	27	9/24/2014 17:05	mg / cm ^2	0.05	0.04
260	WALL	BLACK	CONCRETE	A	NOT INTACT	SECOND	27	9/24/2014 17:06	mg / cm ^2	0.06	0.03

APPENDIX F

LEAD AND HAZARDOUS MATERIALS SURVEY MAPS



FIRST FLOOR

LEGEND

NOT TO SCALE

FIGURE 1.0
LEAD & HAZARDOUS MATERIALS SURVEY
FORMER HARSHAW CHEMICAL COMPANY
1000 HARVARD AVENUE
CLEVELAND, OHIO

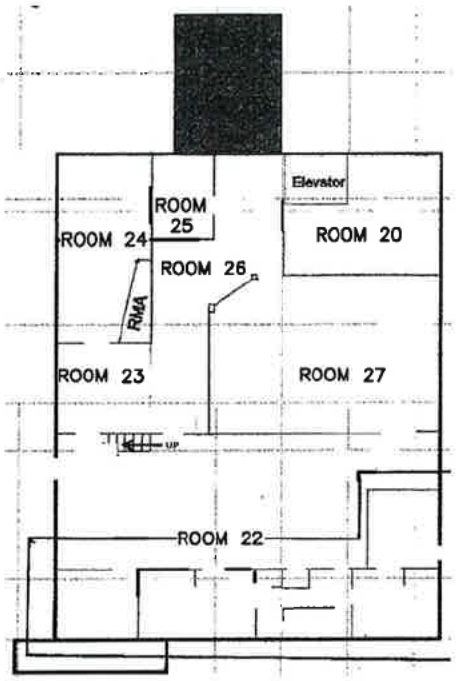
PREPARED FOR
ENVIRONMENTAL CHEMICAL CORPORATION
EDISON, NEW JERSEY

DRAWN CLW/10-10-14	CHECKED
REVISED	APPROVED
JOB NO. 11762.01	
DRAWING NUMBER **1176201-01H**	

TTL associates inc

A

D



B

C

SECOND FLOOR

LEGEND

NOT TO SCALE

FIGURE 2.0
LEAD & HAZARDOUS MATERIALS SURVEY
FORMER HARSHAW CHEMICAL COMPANY
1000 HARVARD AVENUE
CLEVELAND, OHIO

PREPARED FOR
ENVIRONMENTAL CHEMICAL CORPORATION
EDISON, NEW JERSEY

DRAWN CLW/10-10-14	CHECKED
REVISED	APPROVED
JOB NO. 11762.01	
DRAWING NUMBER **1176201-02H**	TTL associates inc

APPENDIX G

HAZARDOUS MATERIALS SURVEY SUMMARY TABLE

HAZARDOUS MATERIALS TABLE
FORMER HARSHAW CHEMICAL CORPORATION
1000 HARVARD AVENUE
CLEVELAND, OHIO
TTL PROJECT NO. 11762.01

	Exterior	First Floor	Second Floor	Third Level High Bay	**Total**
Mercury Vapor Light Bulbs	11	1	3	3	**18**
Fluorescent Light Bulbs	0	0	4 + a pile in Room 24 not estimated	0	**4 + a pile in Room 24 not estimated**
Ballasts	0	0	4 + a pile in Room 24 not estimated	109	**113 + a pile in Room 24 not estimated**
Halogen Flood Lights	2	0	0	0	**2**
Large Bus Fuses	4	0	0	0	**4**
Radioactive Waste	Piles and Areas Through-Out Quantity Not Estimated