Savannah River
NUCLEAR SOLUTIONS℠

Remedial Investigation Work Plan for the Automotive Repair Shop (716-A) Operable Unit (U)

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EXECUTIVE SUMMARY

This Remedial Investigation Report Work Plan has been prepared for the Automotive Repair Shop (716-A) Operable Unit. The operable unit is located in A Area at the Savannah River Site in Aiken, South Carolina. This document presents previous characterization data for the operable unit, defines the data quality objectives, determines the data needs for characterization, and provides a plan for the collection of additional data.

Automotive Repair Shop (716-A) was located in A Area at the SRS (Figure ES-1). The single-story structure was constructed on a concrete slab and had an area of 3,903 square meters (42,014 square feet) under roof. Building 716-A was used as an automotive repair facility containing service bays with offices, related storage areas, and mechanical and electrical rooms. This facility also contained many vehicle lifting systems, battery charging and storage room, and brake repair area. The Automotive Repair Shop (716-A) Operable Unit is a Comprehensive Environmental Response, Compensation and Liability Act-only unit and is listed in Appendix C.4, Deactivation and Decommissioning Facilities (or Remnants) That May Warrant Response Action of the Federal Facility Agreement. The Facility Decommissioning Evaluation for the Automotive Repair Shop (716-A) categorized the building as an "Other Industrial" Hazard Category facility and identified the Integrated Sampling Model as the appropriate decommissioning model for this potentially contaminated facility. The Decommissioning Project Final Report for the Automotive Repair Shop (716-A) concluded the building structure decommissioning activities had been completed, including waste disposal in accordance with federal and state regulations. The building structure was demolished to the foundation. The clean concrete slab remains on its original footprint.

Conclusions and Objectives

Characterization of the Building 716-A remnant concrete slab was accomplished using a combination of process knowledge/historical release information, verification walk downs, and a Final Verification Survey. The Decommissioning Project Final Report concluded that the remaining structure (i.e., remnant concrete slab) was free of hazards, both physical and chemical, and therefore, warranted no further action. No long-term stewardship activities were identified for the structure because it posed no threat to human health or the environment. Building 716-A was transferred to Federal Facility Agreement Appendix C.4, Deactivation and Decommissioning Facilities (or Remnants) That May Warrant Response Action, for further evaluation. During their review of the Facility Decommissioning Evaluation and the Decommissioning Project Final Report, the United States Environmental Protection Agency and South Carolina Department of Health and Environmental Control were concerned about the potential for subsurface leaks and requested sampling of the soil beneath the remnant concrete slab at the 103 Lubrication Pit and drain lines and/or sewer lines within the Automotive Repair Shop (716-A) Operable Unit to determine whether there has been a release to the environment. In a Remedial Investigation Work Plan Scoping Meeting held on October 2, 2023, the Core Team agreed with the request to sample the soil beneath the remnant concrete slab at the 103 Lubrication Pit and drain lines and/or sewer lines within the Automotive Repair Shop (716-A) Operable Unit. The additional sampling of soils beneath the remnant concrete slab is the subject of this Remedial Investigation Work Plan.

Based on the conceptual site model and data quality objectives, the primary objective of the Remedial Investigation Work Plan for the Automotive Repair Shop (716-A) Operable Unit is to complete characterization by sampling soils beneath the remnant concrete slab at the 103 Lubrication Pit and drain lines and/or sewer lines to support the principal threat source material evaluation and a contaminant migration analysis.

To accomplish this objective, a sampling and analysis plan for the additional data needs at the Automotive Repair Shop (716-A) Operable Unit is presented in this Remedial Investigation Work Plan. The proposed strategy for completing characterizing of the operable unit is summarized below.

- Sampling is proposed at six soil boring locations to determine if there has been a release to the environment beneath the concrete slab (Figure ES-2). Samples will be collected from continuous soil cores from each boring, and lithologic descriptions will be recorded. The five locations (ARS-001-SB, ARS-002-SB, ARS-003-SB, ARS-004-SB, and ARS-006-SB) beneath the drain lines and/or sewer lines will be continuously cored to a total depth of 15 meters (50 feet) below ground surface, and samples will be collected every 2 meters (5 feet) through 15 meters (50 feet). Additionally, the 103 Lubrication Pit location (ARS-005-SB) will be continuously cored to a total depth of 49 meters (160 feet) below ground surface, and samples will be collected every 2 meters (5 feet) through 15 meters (50 feet) and every 3 meters (10 feet) thereafter to total depth.

- All samples will be analyzed for all constituents on the Target Analyte List and Target Compound List (excluding herbicides and pesticides), to include all volatiles, semi-volatiles, and polychlorinated biphenyls.

In addition to the data collected at the end of the deactivation and decommissioning phase, data obtained under this Remedial Investigation Work Plan will be used to support the baseline risk assessments, principal threat source material analysis, and contaminant fate and transport analyses for the Automotive Repair Shop (716-A) Operable Unit. The Work Plan implementation is scheduled for a September 30, 2024, field start. The Remedial Investigation/Baseline Risk Assessment is scheduled for submittal in March 2025.

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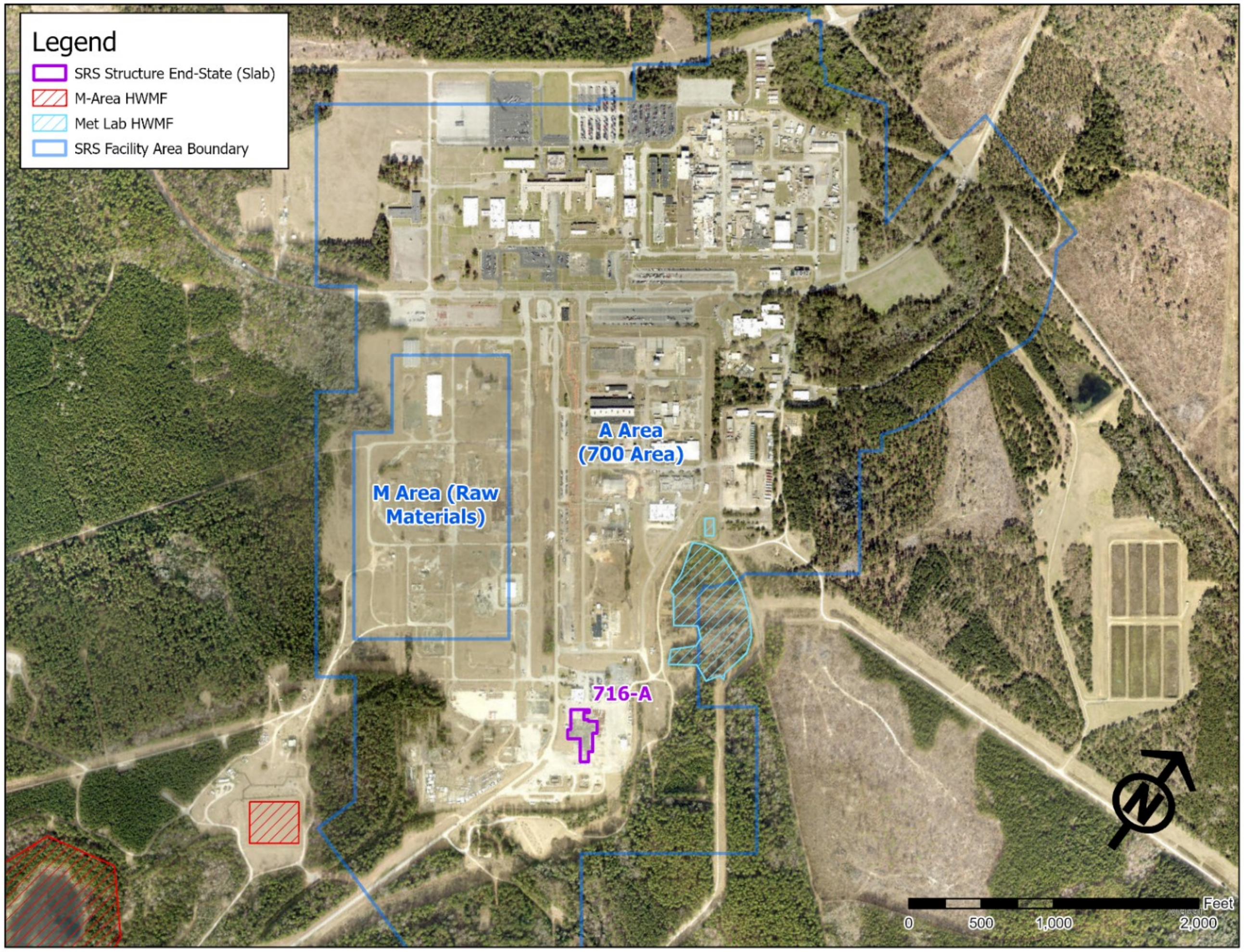

Figure ES-1. Location of Building 716-A within A Area

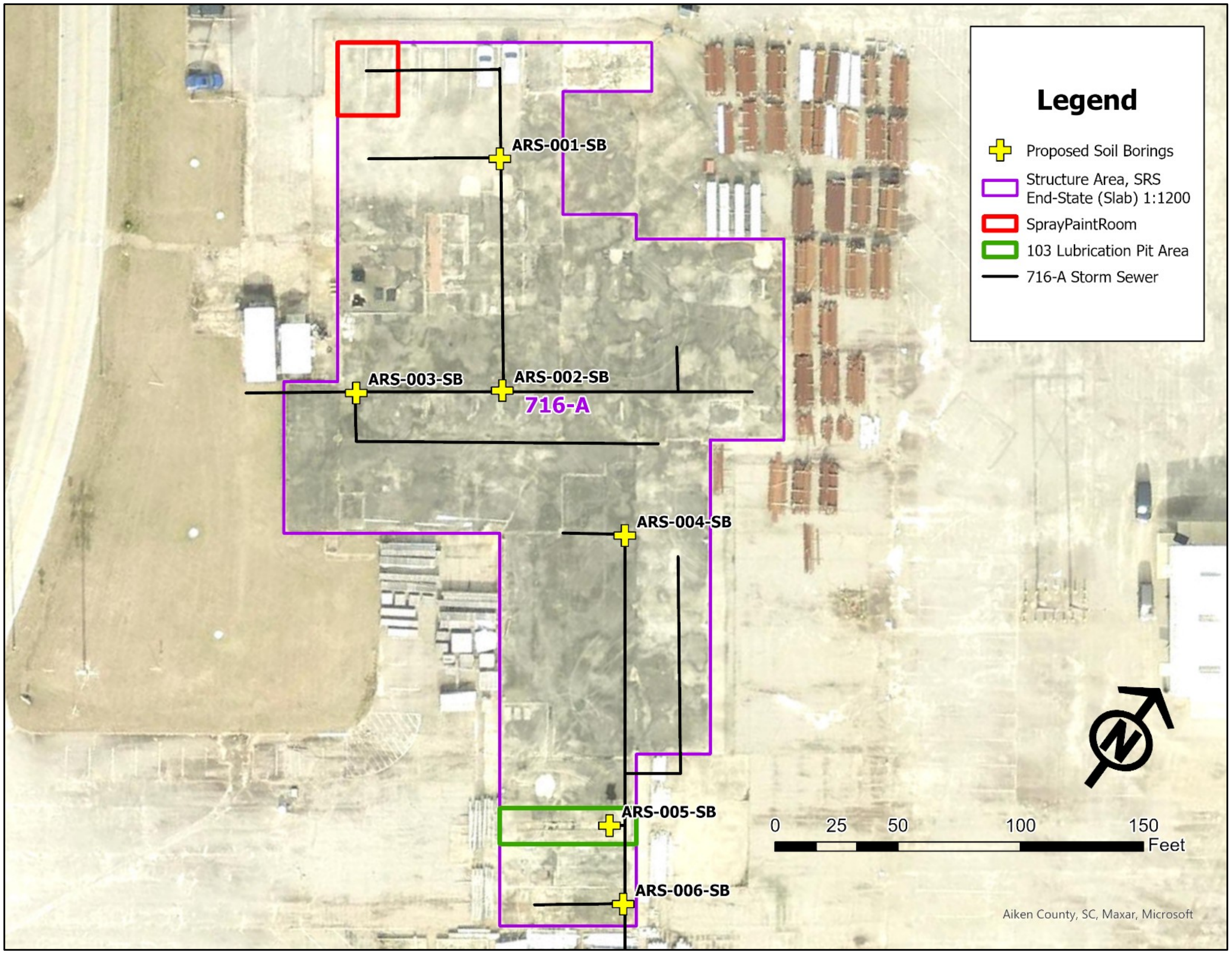

Figure ES-2. Proposed Soil Sampling Locations at Building 716-A

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LIST OF ABBREVIATIONS AND ACRONYMS

~	approximate, approximately
<	less than
≥	greater than or equal to
°C	degrees Celsius
ACP	Area Completion Projects
ARAR	applicable and/or relevant and appropriate requirement
BRA	baseline risk assessment
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
cm	centimeter
CM	contaminant migration
Cr	chromium
CSM	conceptual site model
CWM	clear wide-mouth glass jar
D	definitive
DPFR	Decommissioning Project Final Report
DQD	decision quality data
DQO	data quality objective
EC&ACP	Environmental Compliance and Area Completion Projects
FD	field duplicate
FDE	Facility Decommissioning Evaluation
FFA	Federal Facility Agreement
FS	Feasibility Study
ft	feet
ft^2	square feet
g	gram
H_2SO_4	sulfuric acid
HASP	Health and Safety Plan
HCL	hydrochloric acid
HDPE	high-density polyethylene plastic bottle
Hg	mercury
HH	human health
HI	Hazard Index
HNO_3	nitric acid
HQ	hazard quotient
IDW	investigation derived waste
ISM	Integrated Sampling Model
L	liter
m	meter
m^2	square meters

LIST OF ABBREVIATIONS AND ACRONYMS (*Continued/End*)

MCL	maximum contaminant level
µg/kg	microgram per kilogram
mg/kg	milligram per kilogram
mL	milliliter
$NaHSO_4$	sodium bisulfate
OU	operable unit
Pb	lead
PCB	polychlorinated biphenyl
PQO	project quality objectives
PTFE	teflon lined seals
PTSM	principal threat source material
QA	quality assurance
QAPP	Quality Assurance Program Plan
QC	quality control
RB	equipment/rinsate blank
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RPD	relative percent difference
RSL	regional screening level
SAP	sampling and analysis plan
SARA	Superfund Amendments Reauthorization Act
SCDHEC	South Carolina Department of Health and Environmental Control
SD	screening data
SPL	split sample
SRNL	Savannah River National Laboratory
SRNS	Savannah River Nuclear Solutions, LLC
SRS	Savannah River Site
ssEQL	sample specific estimated quantification limit
TAL	Target Analyte List
TB	trip blank
TBC	to-be-considered
TCL	Target Compound List
TCR	total cumulative risk
TO	Technical Oversight
USC	unit-specific constituents
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
UU	Unverified and Unvalidated
VOA	volatile organic analysis
VOC	volatile organic compound
VU	Verified and Unvalidated
VV	Verified and Validated
VZCOMML	Vadose Zone Contaminant Migration Model-Multi-Layered software V.4.0

1.0 INTRODUCTION

This Remedial Investigation (RI) Work Plan has been prepared for the Automotive Repair Shop (716-A) Operable Unit (OU). The Automotive Repair Shop (716-A) OU is located in A Area at the Savannah River Site (SRS).

Characterization of the Building 716-A remnant concrete slab was accomplished using a combination of process knowledge/historical release information, verification walk downs, and a Final Verification Survey. The Decommissioning Project Final Report (DPFR) concluded that the remaining structure (i.e., remnant concrete slab) was free of hazards, both physical and chemical, and therefore, warranted no further action. No long-term stewardship activities were identified for the structure because it posed no threat to human health or the environment. Building 716-A was transferred to Federal Facility Agreement (FFA) Appendix C.4, Deactivation and Decommissioning (D&D) Facilities (or Remnants) That May Warrant Response Action, for further evaluation (FFA 1993). During their review of the Facility Decommissioning Evaluation (FDE) and the DPFR, the United States Environmental Protection Agency (USEPA) and South Carolina Department of Health and Environmental Control (SCDHEC) were concerned about the potential for subsurface leaks and requested sampling of the soil beneath the remnant concrete slab at the 103 Lubrication Pit and drain lines and/or sewer lines within the Automotive Repair Shop (716-A) Operable Unit to determine whether there has been a release to the environment. In a RI Work Plan Scoping Meeting held on October 2, 2023, the Core Team agreed with the request to sample the soil beneath the remnant concrete slab at the 103 Lubrication Pit and drain lines and/or sewer lines within the Automotive Repair Shop (716-A) OU. The additional sampling of soils beneath the remnant concrete slab is the subject of this RI Work Plan. Within this RI Work Plan, a sampling and analysis plan (SAP) is included to present the scope and objectives of characterization efforts for the Automotive Repair Shop (716-A) OU.

1.1 RI Work Plan Organization

Section 1.0 discusses the purpose and organization of the report, regulatory background, unit description, process history, geology, and hydrogeology for the Automotive Repair Shop (716-A) OU. Section 2.0 presents analytical data and comparisons to screening levels from previous investigations. Section 3.0 establishes the conceptual site model (CSM). Section 4.0 formulates data quality objectives (DQOs) as a basis for planning additional work. Section 5.0 describes how the source will be evaluated and the data collection to be performed in fiscal year (FY) 2025. The SAP for additional data collection is incorporated into Sections 6.0 and 7.0 of the report rather than submitted as a separate SAP report. Section 6.0 provides the analytical plan and data quality levels for each type of data to be collected. Section 7.0 describes the field collection procedures for the planned samples. Section 8.0 presents the unit-specific safety, health, and emergency response plans, and Section 9.0 presents the project schedule following the RI Work Plan submittal.

1.2 Regulatory Background

On December 21, 1989, SRS was included on the National Priorities List. The inclusion created a need to integrate the established Resource Conservation and Recovery Act (RCRA) program with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirements to provide for a focused environmental program. In accordance with Section 120 of CERCLA 42 United States Code Section 9620, the United States Department of Energy (USDOE) negotiated a FFA with USEPA and SCDHEC to coordinate remedial activities at SRS into one comprehensive program, which fulfills these dual regulatory requirements (FFA 1993). The FFA is a legally binding agreement between regulatory agencies and USDOE that establishes the responsibilities and schedules for the comprehensive remediation of SRS. The Automotive Repair Shop (716-A) OU is a CERCLA-only unit and is listed in Appendix C.4, D&D Facilities (or Remnants) That May Warrant Response Action of the FFA (FFA 1993).

1.3 Land Use

The Automotive Repair Shop (716-A) OU is located in an area designated for industrial use as defined by the SRS Land Use Control Assurance Plan (WSRC 1999). No current or projected future development of the OU is planned. Groundwater is not part of the OU and will be addressed under the RCRA corrective action program defined in the SRS RCRA Permit Renewal for the M-Area and Metallurgical Laboratory Hazardous Waste Management Facilities.

1.4 Summary of Operable Unit Description

A Area, which is part of the larger A/M Area in the northwestern portion of SRS (Figure 1), previously served as the main administrative area for the SRS and includes several RCRA/ CERCLA units. Maintenance facilities, such as the Automotive Repair Shop in Building 716-A, were also housed within A Area (Figure 2). The FDE for the Automotive Repair Shop (716-A) categorized the building as an "Other Industrial" Hazard Category facility and identified the Integrated Sampling Model (ISM) as the appropriate decommissioning model for this potentially contaminated facility. The DPFR for the Automotive Repair Shop (716-A) concluded the building structure decommissioning activities had been completed using the ISM in 2005. The building structure was demolished to the foundation. The clean concrete slab remains on its original footprint.

Building 716-A was constructed on a concrete slab and had an area of 3,903 square meters (m^2) (42,014 square feet [ft^2]) under roof. The structure footprint is approxi^{m}ately 55 meters (m) by 110 m (180 feet [ft] by 360 ft). The structure was erected and occupied in 1953. The facility was constructed of a structural steel frame with the exterior walls enclosed in asbestos cement board (transite). The roof consisted of a single ply conventional membrane that was loose laid and covered with stone ballast. Building 716-A was used as an automotive repair facility containing service bays with offices, related storage areas, mechanical, and electrical rooms. This facility also contained many vehicle lifting systems, battery charging and storage room, and brake repair area. Visual evidence indicated that a concrete pad, located on the southeast side of Building 716-A, was the location of an outside underground waste oil storage tank, which was removed per underground storage tank regulations in the early 1990's. The waste oil storage tank was replaced by a new above ground system. An ancillary structure identified as the firewater valve house was located on the west side of Building 716-A. The area around Building 716-A is surrounded by asphalt and/or gravel pavement used for gas stations and parking spaces. The topography is relatively flat, averaging about 111 m (365 ft) above mean sea level and sloping toward the south. The water table in this area is approximately (~) 49 m (160 ft) below ground surface (bgs). The regional direction of groundwater flow is south-southwest.

The geology in A Area is coastal plain sediments consisting of alternating beds of sands, silts, and clays. The vadose zone, a section of unsaturated and semi-saturated sediments from the ground surface down to the water table, is approximately 37 m (120 ft) thick beneath the Automotive Repair Shop

(716-A) OU and includes Eocene age sediments of the Clinchfield, Dry Branch, Tobacco Road, and Upland Unit lithostratigraphic formations. The uppermost aquifer beneath the OU is the Steed Pond Aquifer unit, which is approximately 30 m (100 ft) thick. The Steed Pond Aquifer can be divided into the water table or M-Area Aquifer Zone, the Green Clay Confining Zone, and the Lost Lake Aquifer Zone hydrostratigraphic units.

2.0 PRELIMINARY UNIT EVALUATION

The purpose of this section is to describe and summarize existing information available for Automotive Repair Shop (716-A) OU.

2.1 Previous Investigations

The FDE for the Automotive Repair Shop (716-A) (WSRC 2005a) categorized the building as an "Other Industrial" Hazard Category facility and identified the ISM as the appropriate decommissioning model for this potentially contaminated facility. Characterization was accomplished using a combination of process knowledge/historical release information, verification walkdowns, and sampling as appropriate. A review of the Occurrence Reporting and Processing System/Site Item Reportability Issue Management (ORPS/SIRIM) database from 1993 to 2005 indicated no evidence of any spills to the environment. However, motor oil stains were found in the maintenance areas, the 103 Lubrication Pit (Figures 3 and 4), side trench, hydraulic lifts, cylinders, and narrow trenches. Fluid/oil stains were removed during decommissioning, and the trenches and sumps were sampled to verify contaminants were less than the applicable Derived Concentration Guideline Limits (DCGLs[1]). Based on process knowledge, chemical operations took place only in the Spray Paint Room (Figures 3 and 5). Therefore, the post-decommissioning final verification survey was restricted to the Spray Paint Room. Potential contaminants of concern (COCs) included lead (Pb), chromium (Cr), and volatile organic compounds (VOCs).

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[1] DCGLs are risk-based thresholds for concrete media that were developed by the SRNL in the 2004-2005 timeframe that were used to 1) evaluate human health risk for an industrial worker exposure scenario, and 2) evaluate the potential for constituents to migrate through the vadose zone to underlying groundwater at concentrations above acceptable protection standards.

The Final Verification Survey for the Building 716-A (WSRC 2005c) remnant concrete slab included 16 sample locations, which were composited in 4 sets of 4 samples and were obtained from the Spray Paint Room exposure area for RCRA metals analysis (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) (Figure 6). Nine single samples were taken for VOC analysis in the exposure area (Figure 7). The sample locations depicted on Figures 6 and 7 were all measured in feet from the southwest corner of the Spray Paint Room or point (0, 0). On Figure 6, each color represents the set of four samples used for each composite sample.

The DPFR for Building 716-A (WSRC 2005b) documents the risk assessment that was conducted on the concrete slab of Building 716-A using the final verification survey results. Potential risks were estimated for an industrial worker exposed to residual contamination. The structure was a non-radiological building. Therefore, radiological risks were not considered. For chemical contaminants, the maximum potential cancer risk to an industrial worker exposed to the general slab areas was estimated to be 4.36E-07. The maximum non-cancer hazard quotient (HQ) for the general slab areas was estimated to be 4.89E-02. A vadose zone contamination fate and transport model (Vadose Zone Contaminant Migration Model – Multi-Layered [VZCOMML]) was performed for Building 716-A. The purpose of the model is to identify specific contaminants that could impact the groundwater in A Area. As documented in the DPFR, a comparison of the final verification sample contamination levels with the associated VZCOMML DCGLs demonstrated that the residual contamination on the Building 716-A slab were below threshold levels that could impact the groundwater.

The DPFR concluded the building structure decommissioning activities had been completed, including waste disposal in accordance with federal and state regulations. The building structure was demolished to the foundation. The clean concrete slab remains on its original footprint. The concrete slab remains in place, and penetrations greater than 5 cm (2 inches) in diameter were grouted, including all pits associated with the automotive hydraulic lift systems. Before and after photographs of the decommissioning activities are captured in Figures 8 and 9, respectively. The DPFR concluded that the remaining structure was free of hazards, both physical and chemical, and therefore warrants no further action. No long-term stewardship activities were identified for the structure because it posed no threat to human health (HH) or the environment.

Comments received by the USEPA and the SCDHEC on the FDE and DPFR requested SRS to conduct soil sampling for target analyte list/target compound list (TAL/TCL) constituents underneath the concrete slab at the 103 Lubrication Pit area to determine whether there has been a release to the environment. Because the soil beneath the Building 716-A slab was outside of the scope (i.e., physical boundary) of the facility decommissioning project, Building 716-A was transferred to FFA Appendix C.4, D&D Facilities (or Remnants) That May Warrant Response Action, for further evaluation. Sampling beneath the concrete slab at the 103 Lubrication Pit will be addressed in this RI Work Plan. In addition, a comment received from the USEPA on the FDE requested that all drain lines and/or sewer lines for Building 716-A be referred to the A Area Completion program for further investigation. Sampling beneath the drain lines and/or sewer lines at Building 716-A will now be addressed in this RI Work Plan because completion of A Area is not anticipated for several decades.

The risk information presented in the DPFR for this facility followed protocols that were developed by the Savannah River National Laboratory (SRNL) in the 2004-2005 timeframe. Therefore, the risks presented in historical D&D documents (i.e., comparison to DCGLs) do not align with the current methodology for evaluating HH risk. For this reason, the risk estimates were recalculated based on current SRS Environmental Compliance & Area Completion Projects (EC&ACP) protocols (SRNS 2023) using the USEPA Regional Screening Level (RSL) table (USEPA 2023) to obtain the risk-based thresholds used in the evaluation. Per SRS protocols, RSLs for soil media are multiplied by ten (10x) to obtain thresholds for concrete media. This step acknowledges that the exposure assumptions for competent, hardened concrete are different from (i.e., less than) the exposure assumptions for more friable soil media. As defined by CERCLA, a risk of less than 1.0E-06 and a HQ of less than 1 were used as the maximum acceptable risk thresholds for the residential and industrial worker risk scenarios.

The maximum detected concentration of each analyte in the Spray Paint Room exposure area (Appendix B of the DPFR) was used to recalculate HH risk using current EC&ACP protocols (Table 1). The residential scenario had a hazard index (HI) = 0.017 and total cumulative risk (TCR) = 4.1E-07, and the industrial worker scenario had HI = 0.0029 and TCR = 9.4E-08. There are no problems warranting action for the remnant slab from a HH risk perspective.

A quantitative ecological risk assessment is not warranted. The concrete slab does not provide any habitat, and a survey of the surrounding area indicates the physical setting does not provide adequate habitat for community level impacts to wildlife receptors since it is very small in size and located in an industrial setting. There are no problems warranting action from an ecological risk perspective.

Based on comments received on the DPFR, additional sampling and evaluation is needed for soils beneath the remnant concrete slab at the 103 Lubrication Pit area as well as drain/sewer lines to determine whether there has been a release to the environment.

2.2 Unit Evaluation Conclusions

The remaining concrete pad does not pose an unacceptable risk to human or ecological receptors and does not represent a contaminant migration threat to groundwater. Based on comments received on the DPFR, additional sampling and evaluation is needed for soils beneath the concrete slab at the 103 Lubrication Pit area as well as the drain/sewer lines to determine whether there has been a release to the environment.

2.3 Operable Unit Strategy

Building 716-A was decommissioned using the ISM. The DPFR determined the remaining structure is free of hazards, both physical and chemical, and therefore warrants no further action. The recalculated risks using current EC&ACP protocols confirms this conclusion. However, comments were received from both the USEPA and SCDHEC for SRS to conduct soil sampling for TAL/TCL constituents underneath the remnant concrete slab at the 103 Lubrication Pit area to determine whether there has been a release to the environment. In addition, drain lines and/or sewer lines for Building 716-A will be investigated through this RI to address USEPA's comment on the FDE. Proposed soil sampling locations at Building 716-A are shown on Figure 10.

2.4 Potential ARARs and TBC Criteria

Section 121(d) of the CERCLA, as amended by the Superfund Amendments Reauthorization Act (SARA), requires that remedial actions comply with requirements and standards set forth under Federal and State environmental laws. SARA requires that the remedial action for a site meet all applicable and/or relevant and appropriate requirements (ARARs) unless a waiver is invoked.

Development of ARARs and to-be-considered (TBC) criteria is an iterative process performed through the assessment and corrective action of the unit. ARARs may be location-, chemical-, or action-specific.

Analytical data are compared to the chemical-specific ARARs. Chemical-specific ARARs or TBC requirements exist under Federal and State regulations for Pb and polychlorinated biphenyls (PCBs) in soil and concrete.

For Pb in soil, the CERCLA value of 400 milligram per kilogram (mg/kg) was set by the USEPA Office of Solid Waste Emergency Response and adopted as a TBC for the screening process. The ARAR TBC screening threshold corresponds to the residential RSL of 400 mg/kg. The maximum detected concentration of Pb from the concrete slab is 15.4 mg/kg and is below the chemical-specific ARAR concentration.

PCBs are governed by the Toxic Substances Control Act (40 Code of Federal Regulations [CFR] Part 761). The final rule for PCB disposal was established on August 20, 1998, as amended. It addresses residual levels of PCB remediation waste that can be left in place. Action levels are based on site-specific conditions; soil containing less than 1 mg/kg is considered acceptable for free release.

The soil characterization samples proposed in this RI Work Plan will be compared to the Pb and PCB chemical-specific ARAR concentrations. The list of potential ARARs and TBC criteria (chemical-specific, action-specific, and location-specific) may be modified and refined as more data are obtained as a result of this RI Work Plan.

2.5 Potential Feasibility Study Options

The Automotive Repair Shop (716-A) OU does not have adequate characterization data from previous investigations to determine potential Feasibility Study (FS) options. Following characterization activities to support this RI Work Plan, the potential FS options will be re-evaluated.

2.6 Potential Early and/or Interim Remedial Action

The Automotive Repair Shop (716-A) OU does not have adequate characterization data from previous investigations to determine the need for an early or interim remedial action for underlying soil.

Following characterization activities to support this RI work plan, the need for an early or interim remedial action will be re-evaluated.

3.0 OPERABLE UNIT ASSESSMENT

3.1 Objectives

This section provides a discussion of the OU characterization objectives as they address the CSM and meet the DQO process needs.

3.2 Conceptual Site Model

The CSM is an objective framework for assessing data pertinent to the investigation. The preliminary CSM for the Automotive Repair Shop (716-A) OU is provided in Figure 11.

Exposure pathways describe the course a chemical or physical agent takes from the source to the exposed receptor. The following seven components constitute an exposure pathway:

- Primary Sources
- Primary Sources Environmental Release Mechanisms
- Secondary Sources
- Secondary Sources Environmental Release Mechanisms
- Exposure media (concrete, soil, etc.)
- Exposure route (ingestion, dermal contact, inhalation, external radiation, etc.)
- Receptor (resident, worker, wildlife, etc.)

If any of these elements are missing, the pathway is incomplete and is not considered further in the quantitative risk assessment. A pathway is complete when all seven components are present to permit potential exposure of a receptor to a source of contamination. Exposure analysis is important in terms of identifying all potentially complete exposure routes, understanding the nature and extent (as well as fate and transport) of contamination, and developing preliminary remedial alternatives. In a complete pathway, exposure occurs at exposure points that may represent only a small portion of the entire exposure route. If there is no exposure point, then there is no exposure, and the pathway is considered incomplete.

3.3 Primary Source Characterization

Building 716-A was used as an automotive repair facility containing service bays with offices, related storage areas, and mechanical and electrical rooms. Motor oil stains were found in the maintenance areas, lubrication pit (Room 103), side trench, hydraulic lifts, cylinders, and narrow trenches. Based on process knowledge, chemical operations only took place in the Spray Paint Room. Spills/leaks from routine operation of the shop potentially contaminated portions of the facility.

3.4 Secondary Source Characterization

The post-decommissioning final verification survey was restricted to the remaining concrete slab in the Spray Paint Room. As previously described in Section 2.0, the preliminary HH risk evaluation concluded that there are no problems warranting action, and the exposure pathway is considered incomplete for the concrete pad portion of the facility. In addition, there are no complete exposure pathways for wildlife receptors.

Potential contaminants in the soil beneath the 103 Lubrication Pit Area and the drain/sewer lines may leach to groundwater above groundwater protection standards and additional sampling and evaluation is needed for these soils beneath the remnant concrete slab to determine whether there has been a release to the environment.

3.5 Exposure Media Characterization

Soil samples beneath the remnant concrete slab will be collected in accordance with the subsequent sections of this RI Work Plan. The soil data will be used to conduct a formal principal threat source material (PTSM) evaluation for toxicity and a contaminant migration analysis for potential impacts to groundwater.

4.0 DATA QUALITY OBJECTIVES

The purpose of this section is to provide a discussion of DQOs. DQOs are quantitative and qualitative descriptions of the information required to achieve project goals. They apply to all unit remediation activities, including, but not limited to, scoping for potential contamination, verifying contamination, characterizing the extent and concentration of contamination, risk assessment, evaluation and design of alternative cleanup remedies, and monitoring cleanup. The focus of the DQO development process is effective and efficient planning for data collection. The DQO process is participatory, encouraging input and consensus for all data users. The process is intended to encourage effective, efficient thinking about key data planning issues, thus bringing increased understanding and acceptance of project goals. The DQO process is a series of planning steps based on the scientific method (see Section 4.1.1 through 4.1.7 below) and are detailed in EPA540-R-93-071, *Data Quality Objectives Process for Superfund* (USEPA 1993). The DQO process provides a systematic, flexible approach to decision-making. The steps are portrayed sequentially, but the DQO process is iterative. The DQOs for the soils beneath the remnant concrete slab are found in Table 2.

4.1 Data Quality Objective Evaluation

4.1.1 State the Problem

Building 716-A was decommissioned using the ISM. The DPFR determined the remaining structure is free of hazards, both physical and chemical, and therefore warrants no further action. The recalculated risks using current EC&ACP protocols confirms this conclusion. However, comments were received from both the USEPA and SCDHEC for SRS to conduct soil sampling for TAL/TCL constituents underneath the concrete slab at the 103 Lubrication Pit area to determine whether there has been a release to the environment. In addition, all drain lines and/or sewer lines for Building 716-A will be investigated through this RI to address USEPA's comment on the FDE. Proposed soil sampling locations are shown on Figure 10.

4.1.2 Identify the Decisions of the Study

There is no unit-specific soil data available beneath the building remnant concrete slab. Therefore, sampling is proposed to define the nature and extent of contamination in soils beneath the concrete slab at the 103 Lubrication Pit area and the drain lines and/or sewer lines. These data are needed to support the PTSM evaluation and the contaminant migration (CM) analysis.

4.1.3 Identify the Inputs to the Decisions

All relevant data collected for the Automotive Repair Shop (716-A) OU have been reviewed and summarized in Section 2.1 of this document. There is not sufficient data to make remedial decisions for the OU and additional data is required. Therefore, a data collection event is necessary.

The most recent USEPA RSLs and maximum contaminant levels (MCLs) will be used as the basis for acceptance/performance criteria to determine if contaminated media poses a risk to HH or the environment. RSLs and MCLs will be used as the basis to guide remedial decisions concerning PTSM and CM, respectively. Additionally, metals data for naturally occurring constituents detected in all sample depths will be compared against SRS background soil values (WSRC 2006) to identify unit-specific constituents (USCs). A CM analysis will be conducted on any resulting USCs to determine the potential for groundwater impacts.

4.1.4 Define the Boundaries of the Study

The single-story structure was constructed on a concrete slab and had an area of 3,903 m^2 (42,014 ft^2) under roof. The structure footprint is approximately 55 m by 110 m (180 ft by 360 ft). The 103 Lubrication Pit is 0.8 m (2 ft 6 inches) wide by 12 m (40 ft) long by 1 m (4 ft) deep. There is approximately 290 m (950 ft) of drain lines and/or storm sewer lines extending beneath the remnant concrete slab. Building 716-A was used as an automotive repair facility containing service bays with offices, related storage areas, and mechanical and electrical rooms. The boundary of the study is limited to the soils beneath the concrete slab and are associated with the l03 Lubrication Pit and drain lines and/or storm sewer lines. The boundary of the unit is shown in Figure 3.

4.1.5 Develop Decision Rules and Analytical Approach

The purpose of data collection beneath the Building 716-A remnant slab is to determine whether there has been a release to the environment. No previous soil investigation data beneath the building slab exists. All soil samples collected beneath the building slab will be analyzed for TAL/TCL constituents (excluding herbicides and pesticides). Based on unit history and the CSM, the soil samples do not need to be analyzed for herbicides and pesticides. Table 3 provides the laboratory analytical specifications (constituents, analytical methods, detection limits) for the soil data that is required to support the PTSM evaluation and CM analysis and determination of problems warranting action.

4.1.6 Specify the Limits on Decision Errors

RI Work Plan characterization sample locations were chosen based on comments received from the USEPA and SCDHEC. The USEPA and SCDHEC requested SRS to conduct soil sampling for TAL/TCL constituents underneath the concrete slab at the 103 Lubrication Pit and beneath the drain lines and/or sewer lines.

Total study error is the additive impact of two main sources of error: 1) sampling error, and 2) measurement error, with sampling error being responsible for the vast majority of the total error. "As much as 90% or more of the uncertainty in environmental data sets is due to sampling variability as a direct consequence of the heterogeneity of the environmental matrices" (Crumbling et al. 2001). The method best suited to reduce sampling error is to gather representative samples (Crumbling et al. 2001).

It is incorrect to assume that randomly collected, non-representative samples, plus perfect analytical chemistry will always lead risk managers to correct risk management decisions. In order to avoid incorrect risk management decisions, it is more important to develop decision quality data (DQD). DQD is defined as "Data of known quality that can logically be demonstrated to be effective for making the specified decision because both the sampling and analytical uncertainties are managed to the degree necessary to meet clearly defined and stated data needs" (Crumbling et al. 2001). Therefore, it is more important for the risk managers to use DQD, emphasizing representative sampling with a specified percentage of definitive data in order to make a correct decision. This data collection approach should not be confused by emphasizing analytical data quality, which does not necessarily equate to a correct risk management decision.

Because the SRS possesses significant process and historical knowledge and, in most instances, has preliminary or survey data results for the majority of its waste units, this sampling plan will largely control sampling error (the cause of greatest total error) and set tolerable limits on decision errors by gathering data by judgmental, judgmental-stratified, and systematic sampling designs based on process knowledge, existing data, historical information/data, survey data, and institutional knowledge to generate DQD. This is the method SRS will use to control decision errors, since sample collection will be focused in areas of known contamination rather than using a sampling design intended to randomly search for contamination. Judgment-based sampling provides a very conservative and certain method for collecting data with a high likelihood for detecting worst-case contaminant concentrations while reducing total study error. Project quality objectives (PQOs) are qualitative and quantitative statements derived from the DQO process that clarify study objectives for the measurement performance criteria which define the appropriate types of data and acceptance limits for data. PQOs are used as the basis for establishing the quality and quantity of data needed to support decisions. The PQOs for the Automotive Repair Shop (716-A) OU include the following:

- Relative percent difference (RPD) less than (<) 50% between regular soil sample and field duplicate (FD) when result is greater than or equal to (≥) sample-specific estimated quantification limit (ssEQL) for precision data quality indicator.
- RPD <200% when soil sample result ≥ method detection limit but < ssEQL for accuracy/bias for precision data quality indicator.
- Percent Recovery from matrix spike (MS) and MS duplicates are generally between 30% and 135% for accuracy/bias data quality indicator. MS recovery windows may be tighter than those listed. Refer to the Measurement Performance Criteria Tables in the Quality Assurance Program Plan (QAPP) (SRNS 2012a) for analyte and media-specific recovery percentages.
- No target compound ≥ ssEQL for equipment blank, field blanks, method blanks, or instrument blanks for accuracy data quality indicator.
- ssEQL <RSL as achievable per approved methods for sensitivity data quality indicator.
- Split sample (SPL) result will have an RPD <200% for soil samples.
- 5% of the samples will be SPLs for the comparability data quality indicator.
- 95% of samples sent to laboratory have useable (non-rejected) results for completeness data quality indicator.

- 90% of planned samples are collected and their data are useable for completeness data quality indicator.

The objective for the representativeness data quality indicator is qualitative and will be met by properly documenting field and analytical protocols. In the event these procedures and methods are not able to be implemented, the appropriate corrective action documentation should encompass the impact on the representativeness of the information. When review of the data and documentation determines the data to be nonrepresentative, the information is qualified for use or is not used by the project.

4.1.7 Optimize Design for Obtaining Data

In general, soil samples will be collected using Rotosonic coring methods, or equivalent drilling method. Soil samples will be analyzed for the TAL/TCL constituents (excluding herbicides and pesticides) (Table 3). SAP content is provided in Sections 5.0 through 7.0.

4.2 Summary of DQO Evaluation

Characterization of the soils beneath the Building 716-A remnant concrete slab is needed for RI/Baseline Risk Assessment (BRA) (i.e., PTSM evaluation and CM analysis) and determination of problems warranting action. Decision rules have been formulated for determining nature and extent of contamination.

5.0 SAMPLE DESIGN AND RATIONALE

The following section describes how the plan is implemented to collect the physical data to meet the criteria developed during the DQO process.

5.1 Rationale for Operable Unit/Media

Characterization through soil sampling is warranted in this RI work plan. Soil sampling is proposed beneath the Building 716-A remnant concrete slab at the 103 Lubrication Pit and beneath the drain lines and/or sewer lines. A total of six locations have been identified for sampling. Samples will be collected from continuous soil cores from each boring, and lithologic descriptions will be recorded. The five locations (ARS-001-SB, ARS-002-SB, ARS-003-SB, ARS-004-SB, and ARS-006-SB) beneath the drain lines and/or sewer lines will be continuously cored to a total depth of 15 m (50 ft) bgs, and samples will be collected every 2 m (5 ft) through 15 m (50 ft). Additionally, the 103 Lubrication Pit location (ARS-005-SB) will be continuously cored to a total depth of 49 m (160 ft) bgs, and samples will be collected every 2 m (5 ft) through 15 m (50 ft) and every 3 m (10 ft) thereafter to total depth. The proposed sampling is summarized in Table 2.

Rotosonic sample collection, or equivalent drilling method, will be used for all locations. Six locations have been identified to aid in contamination determination. All samples will be analyzed for all TAL/TCL constituents (excluding herbicides and pesticides) (Table 3).

6.0 ANALYTICAL PLAN

This section describes the data quality levels for each type of data being collected. All data collected under this RI Work Plan will follow the *Area Completion Projects (ACP) Quality Assurance Project Plan for Environmental Data Collection and Management* (SRNS 2012a). The data quality level is determined by the intended use of the data.

The list of TAL/TCL constituents (excluding herbicides and pesticides), analytical methods, and detection limits for soil samples are listed in Table 3. Table 4 presents the minimum field quality control/quality assurance sampling requirements. Table 5 lists hold times, preservatives, and sample containers for all analyses. A summary of the samples to be collected is presented in the sample matrix in Table 6.

6.1 Data Quality Levels for Operable Unit/Media

The characterization data will have an SRS validation level of screening data (SD), which is data that is electronically Verified and Validated (VV) data, with 10% of the data receiving additional manual validation to the SRS Definitive (D) level (SRNS 2012b; SRNS 2012c). SD data is VV data which meet the following selected aspects of USEPA Functional Guideline criteria: Quantitation Limits, Surrogate or Tracer Recoveries, Blanks (Method/Lab/Prep, Trip, Field, Equipment/Rinsate), Laboratory Control Spike Recoveries, MS Recoveries/Duplicates, Lab Replicates, Field Replicates, Cooler Temps, Chemical Preservation, Holding Times. Requirements for SD data are listed in Table 4.

6.2 Field Analytical Sampling Quality Assurance/ Quality Control

Quality control (QC) samples will consist of FD, rinsate blank (RB), trip blank (TB), and SPL samples. Field quality assurance (QA)/QC will be maintained through the use of QA/QC samples and methods as described below.

1. FD (co-located) Samples: Two or more independent samples collected from side-by-side locations at the same point in time and space so as to be considered identical. These separate samples are intended to represent the same population and are carried through all steps of the sampling and analytical procedures in an identical manner. These samples are used to assess precision of the total method, including sampling, analysis, and site heterogeneity. FD samples are planned at a combined minimum rate of 5% according to Manual C3, Volume 10, ER-SOP-043, standard operating procedure for *Obtaining and Managing Environmental Data for Environmental Compliance & Area Completion Projects*, or typically 1 per 20 samples and analyzed for the same parameters as the associated samples.

2. Equipment/RB: A sample of water free of measurable contaminants poured over or through decontaminated field sampling equipment that is considered ready to collect or process an additional sample. The purpose of the RB is to assess the adequacy of the decontamination process. RBs are typically planned at a rate of 1 blank per 40 samples.

3. TB: A clean sample of water free of measurable contaminants that is taken to the sampling site and transported to the laboratory for analysis without having been exposed to sampling procedures. TBs are analyzed to assess whether contamination was introduced during sample shipment (typically analyzed for VOCs only). A blank consists of distilled-deionized water provided by the laboratory to be placed in every cooler with VOC samples typically at the rate of 1 blank per cooler.

4. SPLs: Two or more representative portions from a sample in the field, analyzed by at least two different laboratories and/or methods. Prior to splitting, a sample is mixed (except volatiles, oil and grease, or when otherwise determined) to minimize sample heterogeneity. These are quality

control samples used to assess precision, variability, and data comparability between laboratories. SPLs are planned at a combined minimum rate of 5% or typically 1 per 20 samples and analyzed for the same parameters as the associated samples.

6.3 Sample Matrix Table

Table 6 is a Sampling Matrix table that includes all the detailed information for all samples planned to be collected. FDs, RBs, SPLs, and TBs are not shown on the table but will be produced during the work planning stage. The exact number of samples may change based on field conditions.

6.4 Sample Location Map

Figure 10 illustrates the proposed locations of samples to be collected.

7.0 FIELD IMPLEMENTATION

The following section outlines the field implementation procedures and processes for the 716-A OU work plan characterization effort. Additional implementing documents such as the environmental evaluation checklist, automated hazard analysis, radiological work instructions, and site-specific health and safety plans and investigation derived waste (IDW) plans are internal to SRS and detail day-to-day sampling operations and safety requirements.

7.1 List of Sampling/Collection Equipment

In addition to the drilling rigs, the following sampling equipment will be required:

- Camera for photo documentation;
- Field logbook and/or field data recorder;
- Global positioning system unit;
- Personal protective equipment;
- Stainless steel scoops, stainless steel mixing bowls, and VOC syringes;
- Balance capable of weighing to 0.01 grams;
- KIJ5 radio, cell phone, and pager;

- All sample bottles with preservatives; and
- Cooler and frozen blue ice or equivalent for packing samples in the field.

Equipment needs will vary from day to day based on sampling requirements, field conditions, and drilling methods. Specific needs will be addressed at plan-of-the-day meetings by the technical oversight (TO), industrial hygiene personnel, radiological controls inspector, and safety personnel. Decontamination of field sampling equipment will be done in accordance with the 3Q1 Manual Procedure 9016, Section 5.4.

7.1.1 Sample Collection Procedures and Processes

This RI Work Plan characterization effort includes soil sampling only. The following specific procedures will be followed:

- Sampling Surface and Sub-Surface Soils for Analytical Purposes, Savannah River Nuclear Solutions, LLC (SRNS) Manual 3Q1, Section 9016
- Soil and Sediment Sampling, SRNS Manual 3Q1, Section 3005
- Soil Boring Investigations, SRNS Manual 3Q1, Section 9006
- TO Requirements for Groundwater Monitoring Wells and Soil Borings, SRNS Manual 3Q1, Section 9004

These procedures are consistent with the *USEPA Region 4 Field Branches Quality System and Technical Procedures* sampling procedures. Prior to beginning all field activities, all field crews will be required to read the procedures listed above, and the TO will have had experience with that activity.

7.1.2 Sample Documentation

Overall documentation will be done in accordance with *Area Completion Projects Quality Assurance Project Plan for Environmental Data Collection and Management* (SRNS 2012a). Sample documentation will be conducted according to Manual C3, ER-SOP-043, standard operating procedure for *Obtaining and Managing Environmental Data for Environmental Compliance & Area Completion Projects*, which provides the general requirements and guidelines that are necessary for the documentation, record keeping, mobilization, collection, processing, reporting, and storage of environmental data. Data Management Plan, Comprehensive Environmental Data Management System (CEDMS), requires sampling information, such as bar-coded dates, times, sample identifications, weather, etc., to be recorded and maintained in logbooks and Chain-of-Custody documents included in the sampling package delivered to the project. Sampling documentation is tracked through a series of documents including:

- Mobilization Report;
- Chain-of-Custody Forms;
- Field Log Books;
- Analytical Data Packages; and
- SCDHEC- and SRS-required logs and forms.

A logbook for recording sample collection activities will be kept for this project. The subcontractor will ensure the logbook is correctly filled out and returned within two weeks after completion of sampling. Essential field information is the following: sample name, date of collection, time of collection, depth of sample, and sampler's name. Space should be provided for any field observations or comments relating to the quality or representativeness of the sample. If the actual sample location differs from the planned sample location specified by the Chain-of-Custody, the revised sample location should be indicated in the sample logbook. Information on the parent sample of each FD should be recorded.

7.1.3 Chain-of-Custody

Chain-of-Custody procedures establish requirements for sample custody and documenting custody from the time of collection through laboratory analysis. Chain-of-Custody demonstrates that samples obtained in the field have been securely collected and transported and have reached the analytical laboratory without alteration. Chain-of-Custody requirements are established by SRNS Manual 3Q1, Procedure 1001, *Chain-of-Custody Procedure*. At a minimum, Chain-of-Custody documents will include the following information, which is compliant with USEPA requirements:

- Project name – i.e., monitoring well name, stream name, RFI/RI project name, etc.;
- Sample identification;
- Sample identifiers (bar-coded labels);
- Sample description;

- Number of sample containers/bottles;
- Sampler's signature for each sample the sampler indicates;
- Date of sample collection;
- Time of sample collection;
- Whether a sample is preserved or unpreserved;
- Whether a sample is filtered or unfiltered; and
- Analyses to be performed.

A Chain-of-Custody record is used as physical and legal evidence of sample custody to trace the sample from collection through delivery to the analyzing laboratory and where the samples were stored. The Chain-of-Custody record must originate with the responsible organization or the person collecting the sample. Every sample is assigned a unique identification number that is entered on the Chain-of-Custody document. The Chain-of-Custody records each transfer of custody of the samples by a relinquishing party to a receiving organization whose name and identifying contact information is located on the form.

7.1.4 Sample Management and Shipping

Soil samples will be collected in accordance with SRNS Manual 3Q1, Section 9000, Hydrogeologic Data Collection Procedures and Specifications (SRNS 2010). Sample management for analytical laboratories and intra-SRS facilities is primarily controlled by SRNS Quality Assurance Manual 1Q, Procedure 13-1, Packaging, Handling, Shipping, Storage and Receiving. The purpose of this procedure is to define the requirements and specify the responsible parties and their roles for the packaging, handling, shipping, storage, and receiving of items to ensure that they are properly controlled to prevent damage or loss and to minimize their deterioration. Sample shipment is also regulated by SRNS Manual 19Q, Procedure 1.02, General Transportation Requirements for Radioactive and Non-Radioactive Hazardous Materials. These manuals provide specific requirements to sampler personnel for the safe offsite shipment or onsite transfer of radioactive and non-radioactive hazardous materials and hazardous substances, mixed waste (radiological/nonradiological hazardous materials) and empty packaging that have previously contained mixed waste. It specifies the required packaging, labeling, record-keeping, selection of appropriate transportation carrier, and appropriate transport container based on the analytically pre-tested nature of a sample. Radiological samples must meet United States Department of Transportation (DOT) shipping regulations as well. Samples associated with this work plan are expected to be non-hazardous and non-radiological as they represent environmental media rather that waste materials.

Samples will be stored in coolers with blue ice, if applicable, in the custody of the sampler, or designee, until delivered to the ACP Sample Packaging personnel in B Area. If samples need to be stored overnight prior to delivery to the B Area sample-packaging group, then they will be stored in a locked facility with the Chain-of-Custody, and in a refrigerator (4°C ± 2°C) if required for sample preservation. ACP Sample Packaging personnel in B Area will manage, package, and ship samples to the laboratories in accordance with Manual C3, Volume IX, Procedure ER-SOP-803B, Packaging of Non-DOT Samples for On-Site Transfers/Off-Site Shipments. Table 5 lists proper preservatives, holding times, and sample containers for samples collected in the field, stored, and transported to the analytical laboratories.

7.1.5 Data Validation and Data Management

Requirements for data validation/verification and data management procedures are found in SRNS Procedures and Standard Operating Procedures, the USEPA Functional Guidelines, and two USDOE National Policies and Procedures:

- SRNS Manual C1, ER-AP-305 – Use of Field-Generated Blanks;
- SRNS Manual C1, ER-AP-306 – Laboratory Data Records Review;
- SRNS Manual C3, Volume X, ER-SOP-033 – Analytical Data Qualification;
- SRNS Manual C3, Volume X, ER-SOP-043 – Obtaining and Managing Environmental Data for Environmental Compliance & Area Completion Projects;
- Data Management Plan, CEDMS;
- USDOE Consolidated Audit Program, Policies and Practices, Procedure AD-1, Revision 2, November 10, 2009; and
- Quality Systems for Analytical Services, Revision 2.5, USDOE, November 9, 2009.

In addition, SRS procedures incorporate the criteria found in the USEPA National Functional Guidelines to verify, validate, and qualify analytical data to assess its usability for risk and remedial management decisions. Adherence to this complex list of procedures and guidelines establishes: (a) if data meets the specific technical and QC criteria established by the DQOs and laboratory QAPPs; and (b) the usability of any data not meeting the specific technical and QC criteria. All data is qualified for usability using USEPA Functional Guidelines. Adherence to the guideline requirements and the USDOE Audit Program for analytical laboratories allows the data to be qualified based upon a set of nationally established functional guideline qualifiers for uniformity.

Depending upon the PQOs, data will be verified and/or validated according to the following criteria:

- Verification – Confirmation by examination and provision of objective evidence that the specified analytical requirements have been met. This is to be an electronic data deliverable completeness check for all required fields. Data verification consists of a completeness check to confirm that all sampling data and data fields requested from the laboratory have been received and comply with specified requirements.
- Validation – Confirmation by manual examination and provision of objective evidence that the particular requirements for a specific intended use are fulfilled. Data validation consists of any analyte- and sample-specific process for evaluating compliance of the laboratory data received with methods, procedures, or contract requirements.

The ACP Data Management group will enter sample collection and laboratory data into the CEDMS in accordance with Procedure ER-SOP-43. Properly completed and qualified data is entered into the CEDMS Database. Data records are updated, re-qualified, and continuously corrected for usability based on the results of electronic verification and manual validation evaluations as corrective actions are resolved with the analytical laboratories. A data usability report will be prepared that will accompany the RI/BRA report.

7.2 Investigation Derived Waste

Per the *Savannah River Site Investigation-Derived Waste Management Plan* (WSRC 2007b), IDW will be managed according to the site-specific IDW management plan developed for the project.

8.0 SAFETY, HEALTH, AND EMERGENCY RESPONSE PLAN

A unit-specific Health and Safety Plan (HASP) will be prepared in accordance with 29 CFR 1910.120 and approved prior to field investigations. This plan will meet Occupational Safety and Health Administration requirements and follow SRNS safety, health, and emergency response plan guidance (WSRC 1996). All personnel involved in the performance of the work shall be familiar with the provisions of the HASP.

9.0 SCHEDULE

Regulatory approval of the RI work plan is expected in July 2024. Implementation of the work contained herein is scheduled to begin in September 2024. The current schedule identifies that the RI/BRA report will be submitted in March 2025, a FS submitted in November 2025, and a Proposed Plan in July 2026. Should a second phase of characterization for further nature and extent of contamination be required, then the submittal date for the RI/BRA report and subsequent deliverables will be adjusted accordingly. Table 7 illustrates the current project implementation schedule.

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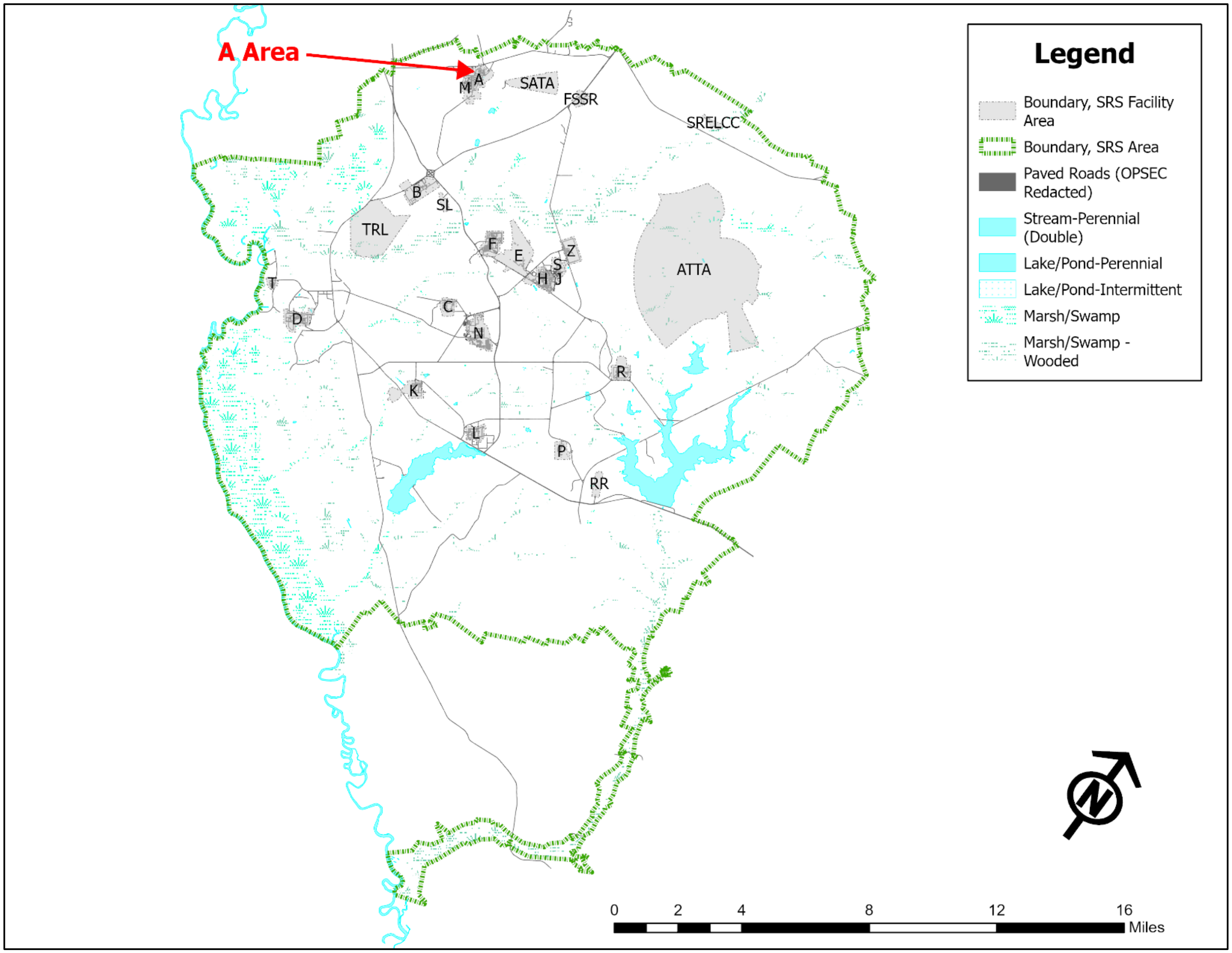

Figure 1. Location of A Area within Savannah River Site

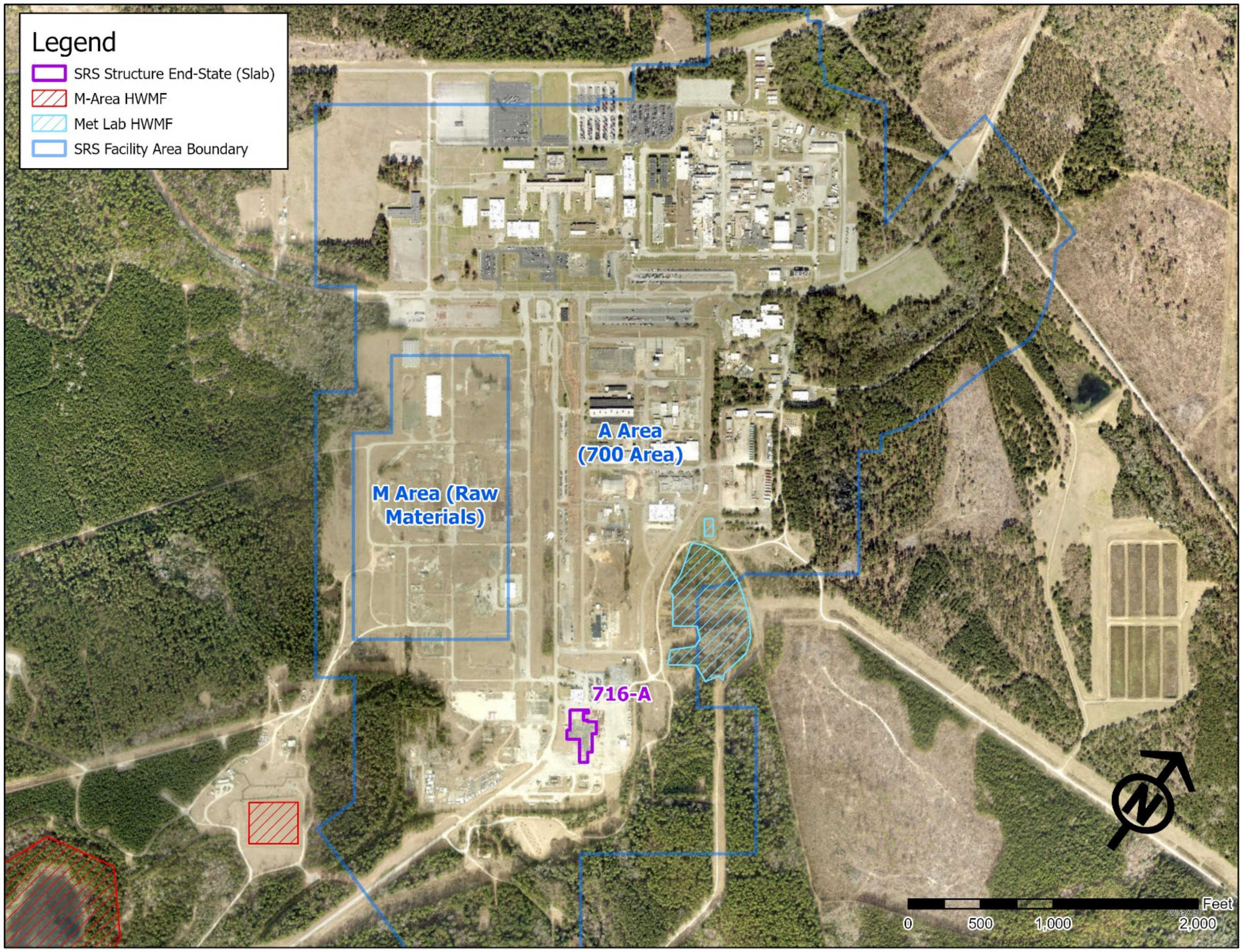

Figure 2. Location of Automotive Repair Shop (716-A) within A Area

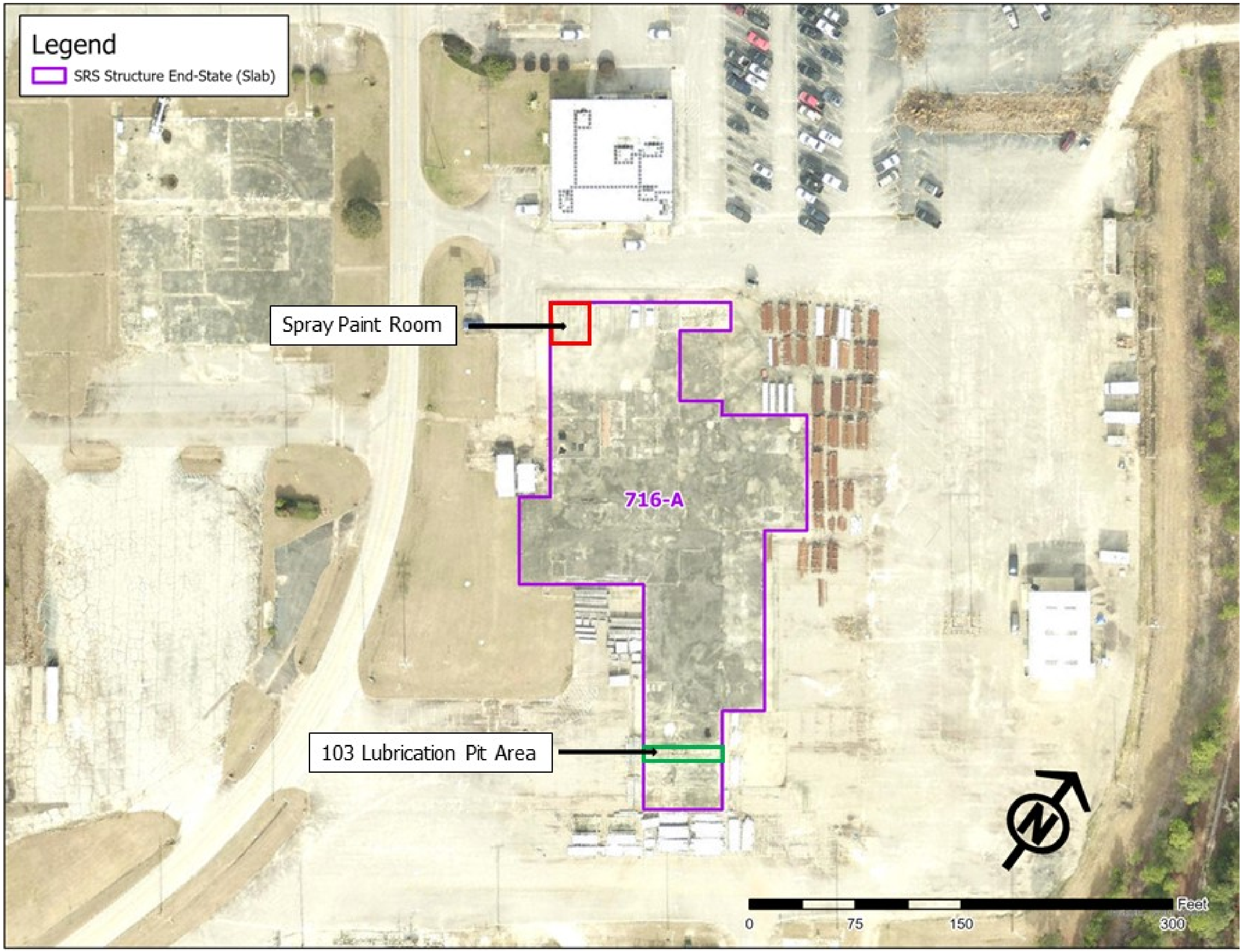

Figure 3. Location of Spray Paint Room and 103 Lubrication Pit Area within Building 716-A

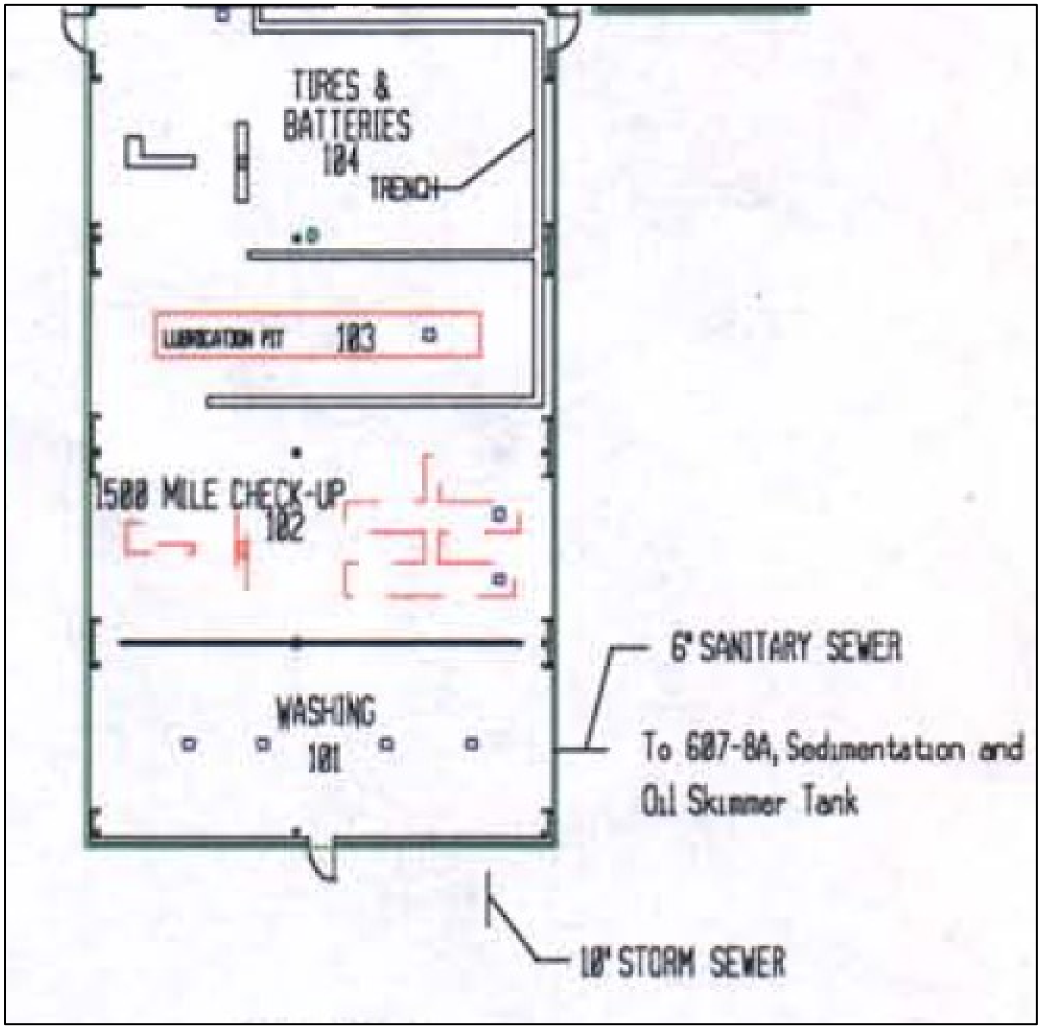

Figure 4. Location of 103 Lubrication Pit within the South End Floor Plan of Building 716-A

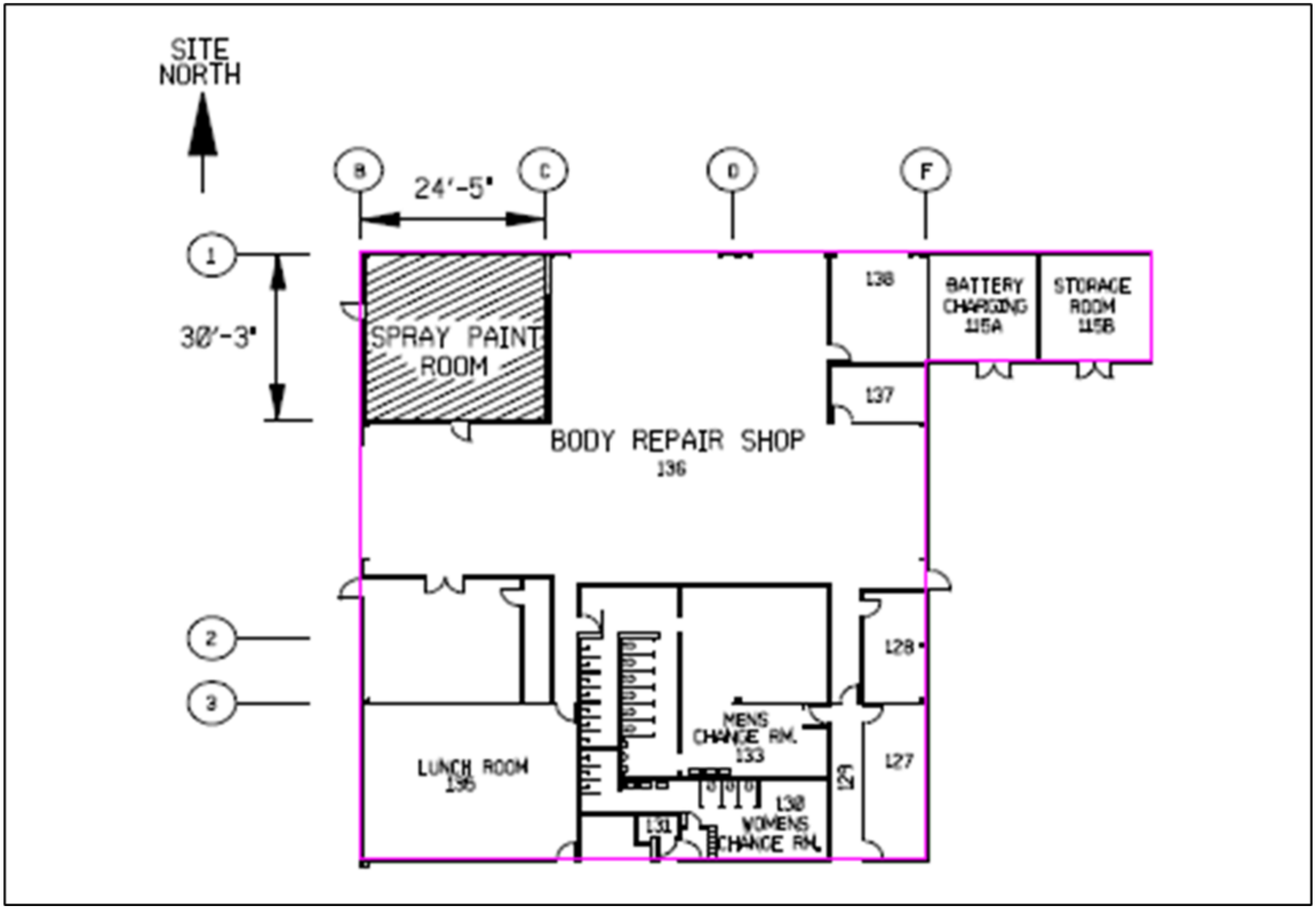

Figure 5. Location of Spray Paint Room in Northwest Corner of Building 716-A

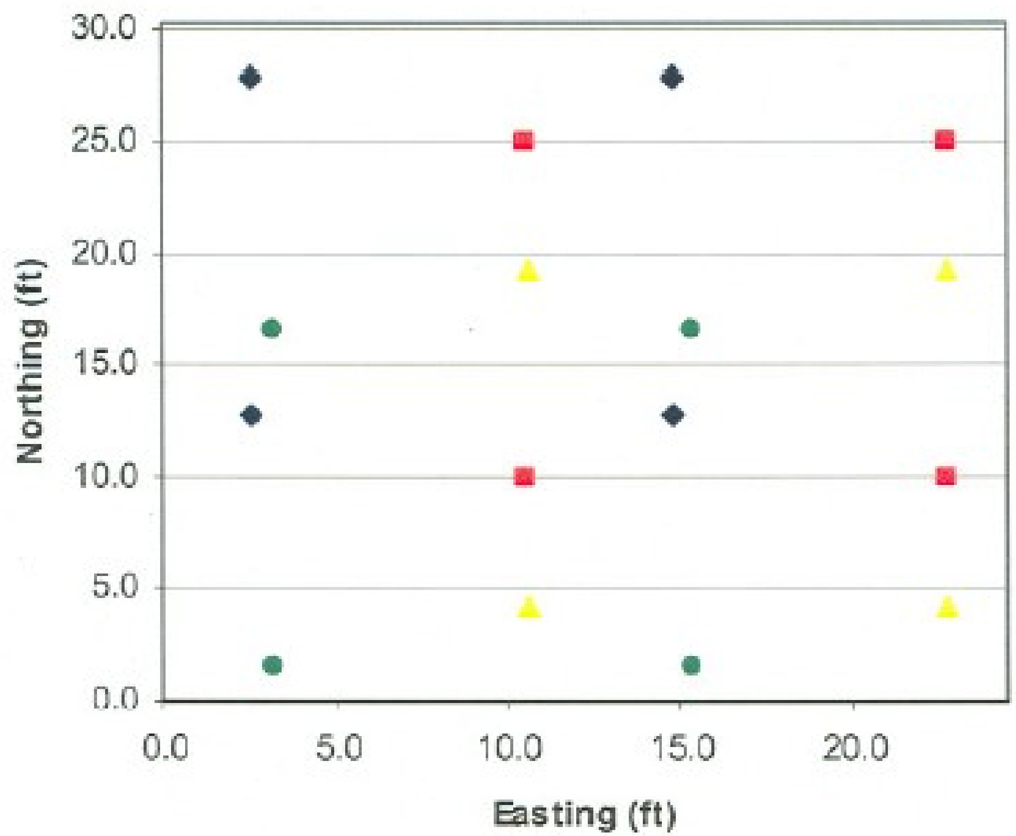

Figure 6. **Sample Locations for RCRA Metals at Building 716-A Spray Paint Room (WSRC 2005c)**
Note: Each color/shape represents the set of four samples used for each composite sample.

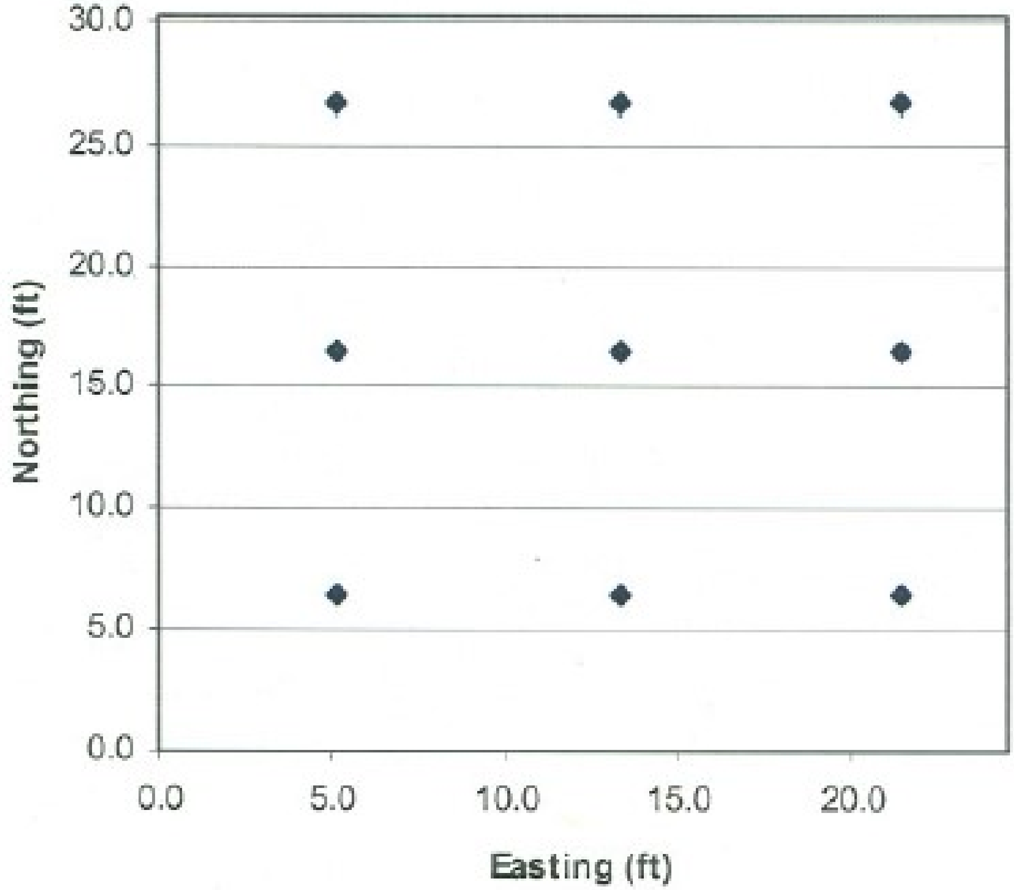

Figure 7. Sample Locations for VOCs at Building 716-A Spray Paint Room (WSRC 2005c)

Figure 8. Building 716-A, Before Decommissioning

Figure 9. Building 716-A Remnant Slab, After Decommissioning

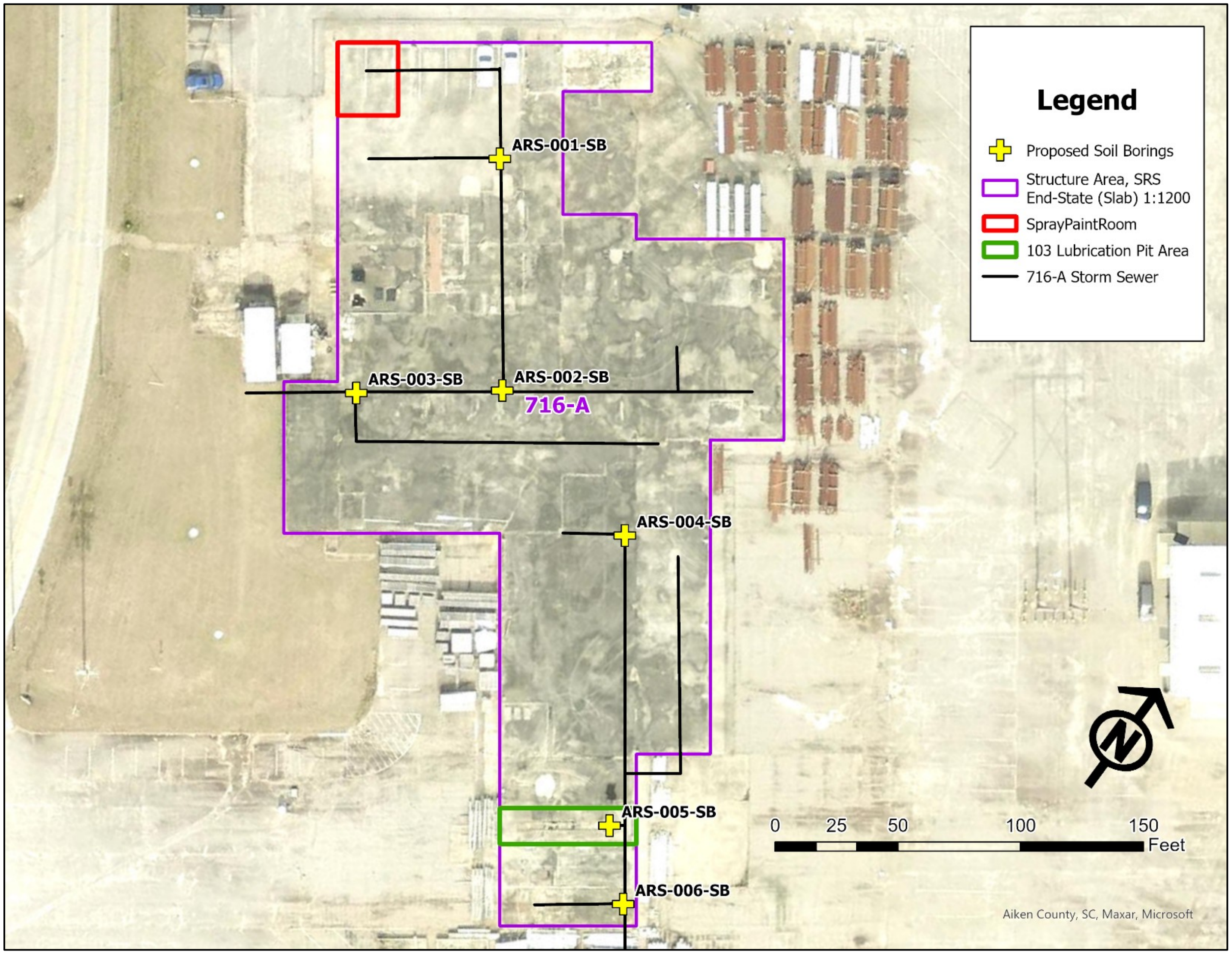

Figure 10. Proposed Soil Sampling Locations at Building 716-A

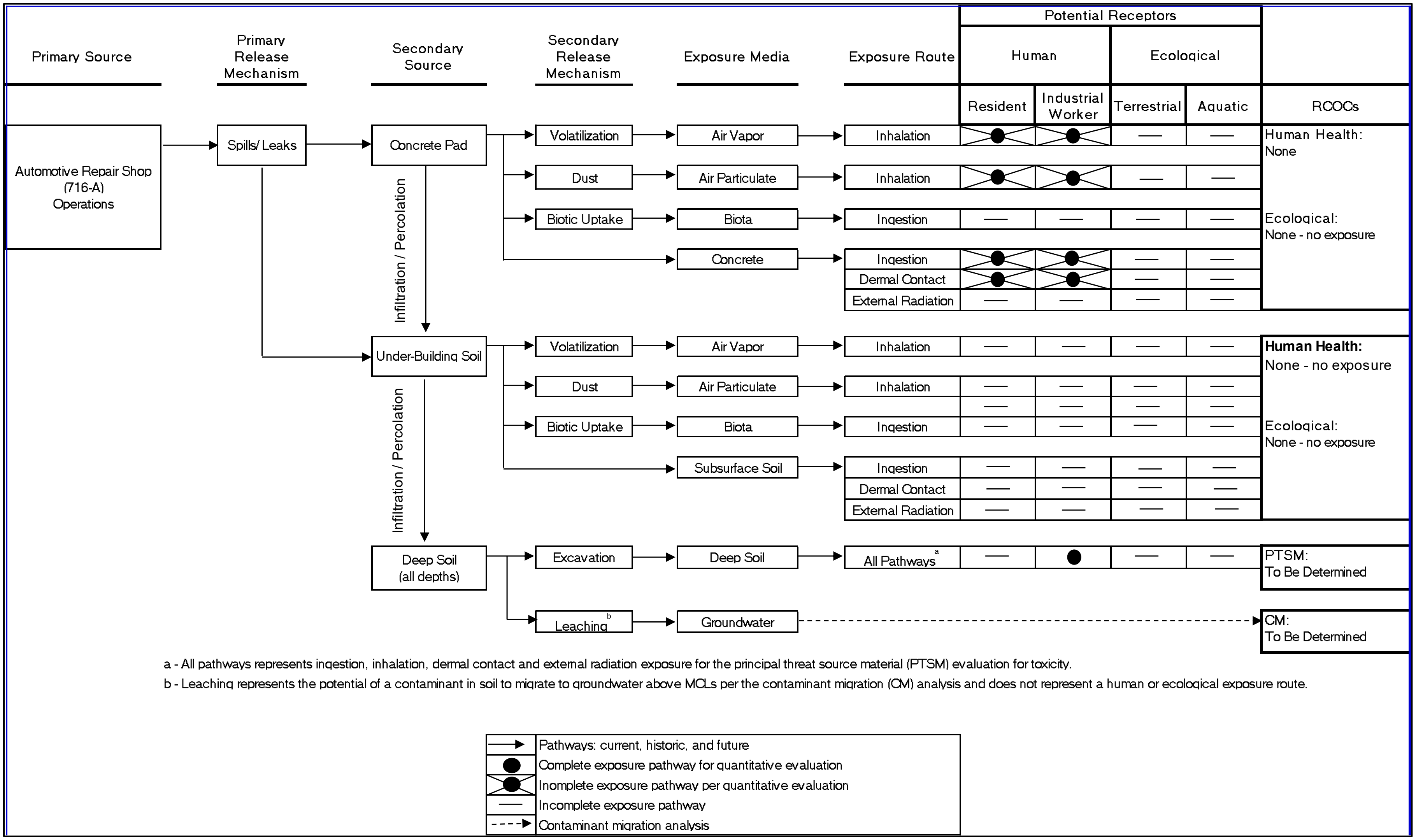

Figure 11. Preliminary Conceptual Site Model for Building 716-A

Table 1. Preliminary Human Health Risk Calculation for Building 716-A Slab (Spray Paint Room Exposure Area)

Analyte	Maximum Concentration[1]	Residential Scenario					Industrial Worker Scenario				
		Residential Soil RSL[2]	Noncarcinogenic Hazard Estimate		Carcinogenic Risk Estimate		Industrial Soil RSL[2]	Noncarcinogenic Hazard Estimate		Carcinogenic Risk Estimate	
			Residential Concrete RSL[3]	Residential HQ Estimate[4]	Residential Concrete RSL[3]	Residential Risk Estimate[5]		Industrial Concrete RSL[3]	Industrial HQ Estimate[4]	Industrial Concrete RSL[3]	Industrial Risk Estimate[5]
Inorganics (mg/kg)											
Arsenic	2.82E+00	6.8E-01	--	--	6.8E+00	4.1E-07	3.0E+00	--	--	3.0E+01	9.4E-08
Barium	4.87E+01	1.5E+04	1.5E+05	3.2E-04	--	--	2.2E+05	2.2E+06	2.2E-05	--	--
Cadmium	8.47E-01	7.1E+00	7.1E+01	1.2E-02	--	--	1.0E+02	1.0E+03	8.5E-04	--	--
Chromium	8.78E+00	1.2E+05	1.2E+06	7.3E-06	--	--	1.8E+06	1.8E+07	4.9E-07	--	--
Lead	1.54E+01	4.0E+02	4.0E+03	3.9E-03	--	--	8.0E+02	8.0E+03	1.9E-03	--	--
Mercury	1.73E-02	1.1E+01	1.1E+02	1.6E-04	--	--	4.6E+01	4.6E+02	3.8E-05	--	--
Selenium	4.21E+00	3.9E+02	3.9E+03	1.1E-03	--	--	5.8E+03	5.8E+04	7.3E-05	--	--
Silver	5.20E-02	3.9E+02	3.9E+03	1.3E-05	--	--	5.8E+03	5.8E+04	9.0E-07	--	--
Organics (mg/kg)											
2-Hexanone	1.64E-02	2.0E+02	2.0E+03	8.2E-06	--	--	1.3E+03	1.3E+04	1.3E-06	--	--
Acetone	7.03E-02	7.0E+04	7.0E+05	1.0E-07	--	--	1.1E+06	1.1E+07	6.4E-09	--	--
Benzene	6.81E-04	1.2E+00	--	--	1.2E+01	5.7E-11	5.10E+00	--	--	5.1E+01	1.3E-11
Ethylbenzene	3.03E-03	5.8E+00	--	--	5.8E+01	5.2E-11	2.5E+01	--	--	2.5E+02	1.2E-11
Methyl ethyl ketone	2.88E-02	2.7E+04	2.7E+05	1.1E-07	--	--	1.9E+05	1.9E+06	1.5E-08	--	--
Methyl isobutyl ketone	1.10E-02	3.3E+04	3.3E+05	3.3E-08	--	--	1.4E+05	1.4E+06	7.9E-09	--	--
Styrene	2.57E-03	6.0E+03	6.0E+04	4.3E-08	--	--	3.5E+04	3.5E+05	7.3E-09	--	--
Toluene	4.49E+00	4.9E+03	4.9E+04	9.2E-05	--	--	4.7E+04	4.7E+05	9.6E-06	--	--
Xylenes	8.67E-03	5.8E+02	5.8E+03	1.5E-06	--	--	2.5E+03	2.5E+04	3.5E-07	--	--
			Hazard Index (HI)	**1.7E-02**	**Cumulative Risk**	**4.1E-07**		**Hazard Index (HI)**	**2.9E-03**	**Cumulative Risk**	**9.4E-08**

1 - Maximum detected concentration from DPFR 716-A, Automotive Repair Shop, V-PCOR-A-00043, Appendix B (WSRC 2005).
2 - RSLs are default resident or industrial worker soil values from the *EPA Regional Screening Levels Table*, dated May 2023.
3 - RSLs for concrete media are ten times (10x) the soil RSLs.
4 - Hazard Estimate (HQ) = maximum concentration /concrete RSL concentration.
5 - Risk Estimate = (maximum concentration/concrete RSL concentration) x 1E-06.

Table 2. Data Quality Objectives for Soil Samples Beneath Building 716-A Concrete Slab

Pathway (Media)	Probable Conditions	Exposure Pathway and/or Release Mechanisms	Data Needs and DQOs Including Engineering / Physical Processes	Field Activities Including Removal and Characterization	Parameters	Potential Remedial Action Alternatives
Soil beneath concrete slab	Potential contaminants (metals and/or solvents) in soil beneath the concrete slab at the 103 Lubrication Pit Area and storm sewer lines may leach to groundwater at levels that exceed groundwater protection standards.	Ingestion, inhalation, absorption, and/or direct exposure with soils for toxicity evaluation under an excavation scenario. Leaching to groundwater.	Determine whether there was a release to the environment. Characterization of soil beneath concrete slab	Collection of soils beneath concrete slab, from 0-160 ft; 0-50 ft; 0-50 ft; 0-50 ft; 0-50 ft; 0-50 ft 6 Locations: 1 beneath the 103 Lubrication Pit; 5 beneath the underground drain lines and/or storm sewer lines throughout the slab	Data validated to SRS electronic VV level, with 10% of the sampling batches validated to the SRS definitive level. Full TCL and TAL suite of analytes (excluding pesticides and herbicides)	No Action Cap/Land Use Controls Excavation of contaminated soils Soil Vapor Extraction

Note: 0 ft = soil immediately beneath concrete slab, not ground surface

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Table 3. Laboratory Analytical Specifications Table TAL/TCL Analytes for Soil Media

Analyte	Analyte ID	Preparation[A] Method	USEPA[A] Method	CRDL[B] *(µg/kg)*
Target Analyte List				
Metals				
Aluminum	7429-90-5	3051A,3052	EPA6010C	1,900
Antimony	7440-36-0	3051A,3052	EPA6010C	350
Arsenic	7440-38-2	3051A,3052	EPA6010C	312
Barium	7440-39-3	3051A,3052	EPA6010C	21
Beryllium	7440-41-7	3051A,3052	EPA6010C	31.1
Cadmium	7440-43-9	3051A,3052	EPA6010C	40
Calcium	7440-70-2	3051A,3052	EPA6010C	69
Chromium	7440-47-3	3051A,3052	EPA6010C	90
Cobalt	7440-48-4	3051A,3052	EPA6010C	80
Copper	7440-50-8	3051A,3052	EPA6010C	100
Iron	7439-89-6	3051A,3052	EPA6010C	2,190
Lead	7439-92-1	3051A,3052	EPA6010C	590
Magnesium	7439-95-4	3051A,3052	EPA6010C	14.1
Manganese	7439-96-5	3051A,3052	EPA6010C	88.5
Mercury	7439-97-6	3051A,3052	EPA7471B	15.2
Nickel	7440-02-0	3051A,3052	EPA6010C	88
Potassium	7440-09-7	3051A,3052	EPA6010C	80
Selenium	7782-49-2	3051A,3052	EPA6010C	5.7
Silver	7440-22-4	3051A,3052	EPA6010C	101
Sodium	7440-23-5	3051A,3052	EPA6010C	298
Thallium	7440-28-0	3051A,3052	EPA6010C	160
Vanadium	7440-62-2	3051A,3052	EPA6010C	74
Zinc	7440-66-6	3051A,3052	EPA6010C	4.3
Target Compound List				
PCBs				
AROCLOR 1016	12674-11-2	3540C,3541,3545A	EPA8082A	3.2
AROCLOR 1221	11104-28-2	3540C,3541,3545A	EPA8082A	0.22
AROCLOR 1232	11141-16-5	3540C,3541,3545A	EPA8082A	0.22
AROCLOR 1242	53469-21-9	3540C,3541,3545A	EPA8082A	0.22
AROCLOR 1248	12672-29-6	3540C,3541,3545A	EPA8082A	0.22
AROCLOR 1254	11097-69-1	3540C,3541,3545A	EPA8082A	0.22
AROCLOR 1260	11096-82-5	3540C,3541,3545A	EPA8082A	0.22
Semi-volatiles				
2,4,5-Trichlorophenol	95-95-4	3540C,3541,3545A,3550C	EPA8270D	7.4
2,4,6-Trichlorophenol	88-06-2	3540C,3541,3545A,3550C	EPA8270D	7.4
2,4-Dichlorophenol	120-83-2	3540C,3541,3545A,3550C	EPA8270D	14
2,4-Dimethylphenol	105-67-9	3540C,3541,3545A,3550C	EPA8270D	14
2,4-Dinitrophenol	51-28-5	3540C,3541,3545A,3550C	EPA8270D	120
2-Chlorophenol	95-57-8	3540C,3541,3545A,3550C	EPA8270D	5.7
2-Methyl-4,6-dinitrophenol	534-52-1	3540C,3541,3545A,3550C	EPA8270D	7.8
2-Nitrophenol	88-75-5	3540C,3541,3545A,3550C	EPA8270D	13
4-Chloro-m-cresol	59-50-7	3540C,3541,3545A,3550C	EPA8270D	55.5
4-Nitrophenol	100-02-7	3540C,3541,3545A,3550C	EPA8270D	156
m/p-Cresol	1319-77-3	3540C,3541,3545A,3550C	EPA8270D	96

Table 3. Laboratory Analytical Specifications Table TAL/TCL Analytes for Soil Media *(Continued)*

Analyte	Analyte ID	Preparation[A] Method	USEPA[A] Method	CRDL[B] *(µg/kg)*
Target Compound List *(continued)*				
Semi-volatiles *(continued)*				
4-Nitrophenol	100-02-7	3540C,3541,3545A,3550C	EPA8270D	156
m/p-Cresol	1319-77-3	3540C,3541,3545A,3550C	EPA8270D	96
o-Cresol (2-Methylphenol)	95-48-7	3540C,3541,3545A,3550C	EPA8270D	5.6
Pentachlorophenol	87-86-5	3540C,3541,3545A,3550C	EPA8270D	3
Phenol	108-95-2	3540C,3541,3545A,3550C	EPA8270D	6.2
1,2,4,5-Tetrachlorobenzene	95-94-3	3540C,3541,3545A,3550C	EPA8270D	170
2,3,4,6-Tetrachlorophenol	58-90-2	3540C,3541,3545A,3550C	EPA8270D	170
1,1'-Biphenyl	92-52-4	3540C,3541,3545A,3550C	EPA8270D	350
2,4-Dinitrotoluene	121-14-2	3540C,3541,3545A,3550C	EPA8270D	44.6
2,6-Dinitrotoluene	606-20-2	3540C,3541,3545A,3550C	EPA8270D	28
2-Chloronaphthalene	91-58-7	3540C,3541,3545A,3550C	EPA8270D	5.6
2-Methylnaphthalene	91-57-6	3540C,3541,3545A,3550C	EPA8270D	50
2-Nitroaniline	88-74-4	3540C,3541,3545A,3550C	EPA8270D	3.5
3,3'-Dichlorobenzidine	91-94-1	3540C,3541,3545A,3550C	EPA8270D	143
4-Bromophenyl phenyl ether	101-55-3	3540C,3541,3545A,3550C	EPA8270D	15
4-Chloroaniline	106-47-8	3540C,3541,3545A,3550C	EPA8270D	16
4-Chlorophenyl phenyl ether	7005-72-3	3540C,3541,3545A,3550C	EPA8270D	40.9
Acenaphthene	83-32-9	3540C,3541,3545A,3550C	EPA8270D	35.2
Acenaphthylene	208-96-8	3540C,3541,3545A,3550C	EPA8270D	35
Acetophenone	98-86-2	3540C,3541,3545A,3550C	EPA8270D	0.49
Anthracene	120-12-7	3540C,3541,3545A,3550C	EPA8270D	44.5
Atrazine	1912-24-9	3540C,3541,3545A,3550C	EPA8270D	2.2
Benzaldehyde	100-52-7	3540C,3541,3545A,3550C	EPA8270D	6100
Benzo[a]anthracene	56-55-3	3540C,3541,3545A,3550C	EPA8270D	29.4
Benzo[a]pyrene	50-32-8	3540C,3541,3545A,3550C	EPA8270D	25.5
Benzo[b]fluoranthene	205-99-2	3540C,3541,3545A,3550C	EPA8270D	55.3
Benzo[g,h,i]perylene	191-24-2	3540C,3541,3545A,3550C	EPA8270D	29.6
Benzo[k]fluoranthene	207-08-9	3540C,3541,3545A,3550C	EPA8270D	58.8
Bis(2-chloro-1-methylethyl) ether	108-60-1	3540C,3541,3545A,3550C	EPA8270D	54.1
Bis(2-chloroethoxy) methane	111-91-1	3540C,3541,3545A,3550C	EPA8270D	7.2
Bis(2-chloroethyl) ether	111-44-4	3540C,3541,3545A,3550C	EPA8270D	69.5
Bis(2-ethylhexyl) phthalate	117-81-7	3540C,3541,3545A,3550C	EPA8270D	35
Butylbenzyl phthalate	85-68-7	3540C,3541,3545A,3550C	EPA8270D	28
Caprolactam	105-60-2	3540C,3541,3545A,3550C	EPA8270D	46.3
Carbazole	86-74-8	3540C,3541,3545A,3550C	EPA8270D	24
Chrysene	218-01-9	3540C,3541,3545A,3550C	EPA8270D	32.9
Dibenz[a,h]anthracene	53-70-3	3540C,3541,3545A,3550C	EPA8270D	33.2
Dibenzofuran	132-64-9	3540C,3541,3545A,3550C	EPA8270D	38.9
Dibutyl phthalate	84-74-2	3540C,3541,3545A,3550C	EPA8270D	28
Diethyl phthalate	84-66-2	3540C,3541,3545A,3550C	EPA8270D	28
Dimethyl phthalate	131-11-3	3540C,3541,3545A,3550C	EPA8270D	28
Di-n-octyl phthalate	117-84-0	3540C,3541,3545A,3550C	EPA8270D	28
Fluoranthene	206-44-0	3540C,3541,3545A,3550C	EPA8270D	3.4
Fluorene	86-73-7	3540C,3541,3545A,3550C	EPA8270D	37.9
Hexachlorobenzene	118-74-1	3540C,3541,3545A,3550C	EPA8270D	32.2
Hexachlorobutadiene	87-68-3	3540C,3541,3545A,3550C	EPA8270D	5.6

Table 3. Laboratory Analytical Specifications Table TAL/TCL Analytes for Soil Media *(Continued)*

Analyte	Analyte ID	Preparation[A] Method	USEPA[A] Method	CRDL[B] *(µg/kg)*
Target Compound List *(continued)*				
Semi-volatiles *(continued)*				
Hexachlorocyclopentadiene	77-47-4	3540C,3541,3545A,3550C	EPA8270D	2.4
Hexachloroethane	67-72-1	3540C,3541,3545A,3550C	EPA8270D	30
Indeno[1,2,3-c,d]pyrene	193-39-5	3540C,3541,3545A,3550C	EPA8270D	30
Isophorone	78-59-1	3540C,3541,3545A,3550C	EPA8270D	44
m-Nitroaniline	99-09-2	3540C,3541,3545A,3550C	EPA8270D	164
Naphthalene	91-20-3	3540C,3541,3545A,3550C	EPA8270D	5.6
Nitrobenzene	98-95-3	3540C,3541,3545A,3550C	EPA8270D	14
N-Nitrosodiphenylamine	86-30-6	3540C,3541,3545A,3550C	EPA8270D	13
N-Nitrosodipropylamine	621-64-7	3540C,3541,3545A,3550C	EPA8270D	55.9
Phenanthrene	85-01-8	3540C,3541,3545A,3550C	EPA8270D	33.5
p-Nitroaniline	100-01-6	3540C,3541,3545A,3550C	EPA8270D	28
Pyrene	129-00-0	3540C,3541,3545A,3550C	EPA8270D	8.2
Volatiles				
1,1,1-Trichloroethane	71-55-6	5035A	EPA8260B	1.18
1,1,2,2-Tetrachloroethane	79-34-5	5035A	EPA8260B	1.33
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	5035A	EPA8260B	C
1,1,2-Trichloroethane	79-00-5	5035A	EPA8260B	0.85
1,1-Dichloroethane	75-34-3	5035A	EPA8260B	1.15
1,1-Dichloroethylene	75-35-4	5035A	EPA8260B	0.054
1,2,4-Trichlorobenzene	120-82-1	5035A	EPA8260B	0.423
1,2-Dibromo-3-chloropropane	96-12-8	5035A	EPA8260B	0.45
1,2-Dibromoethane	106-93-4	5035A	EPA8260B	0.0069
1,2-Dichlorobenzene	95-50-1	5035A	EPA8260B	C
1,2-Dichloroethane (EDC)	107-06-2	5035A	EPA8260B	0.35
1,2-Dichloropropane	78-87-5	5035A	EPA8260B	0.35
1,3-Dichlorobenzene	541-73-1	5035A	EPA8260B	C
1,4-Dichlorobenzene	106-46-7	5035A	EPA8260B	C
2-Hexanone	591-78-6	5035A	EPA8260B	2.86
Acetone	67-64-1	5035A	EPA8260B	7.03
Benzene	71-43-2	5035A	EPA8260B	0.823
Bromodichloromethane	75-27-4	5035A	EPA8260B	1
Bromoform (Tribromomethane)	75-25-2	5035A	EPA8260B	1.15
Bromomethane (Methyl bromide)	74-83-9	5035A	EPA8260B	2.56
Carbon disulfide	75-15-0	5035A	EPA8260B	0.988
Carbon tetrachloride	56-23-5	5035A	EPA8260B	1.22
Chlorobenzene	108-90-7	5035A	EPA8260B	0.987
Chloroethane	75-00-3	5035A	EPA8260B	2.69
Chloroethene (Vinyl chloride)	75-01-4	5035A	EPA8260B	0.15
Chloroform	67-66-3	5035A	EPA8260B	1.42
Chloromethane (Methyl chloride)	74-87-3	5035A	EPA8260B	1.2
cis-1,2-Dichloroethylene	156-59-2	5035A	EPA8260B	C
cis-1,3-Dichloropropene	10061-01-5	5035A	EPA8260B	1.31
Cyclohexane	110-82-7	5035A	EPA8260B	0.08
Dibromochloromethane	124-48-1	5035A	EPA8260B	1.03
Dichlorodifluoromethane	75-71-8	5035A	EPA8260B	4
Dichloromethane (Methylene chloride)	75-09-2	5035A	EPA8260B	1.65
Ethylbenzene	100-41-4	5035A	EPA8260B	1.07

Table 3. Laboratory Analytical Specifications Table TAL/TCL Analytes for Soil Media *(Continued/End)*

Analyte	Analyte ID	Preparation[A] Method	USEPA[A] Method	CRDL[B] *(µg/kg)*
Target Compound List *(continued)*				
Volatiles *(continued)*				
Cumene (Isopropylbenzene)	98-82-8	5035A	EPA8260B	0.254
Methyl acetate	79-20-9	5035A	EPA8260B	22,000
Methyl ethyl ketone	78-93-3	5035A	EPA8260B	4.68
Methyl isobutyl ketone	108-10-1	5035A	EPA8260B	2.62
Methyl tertiary butyl ether (MTBE)	1634-04-4	5035A	EPA8260B	0.107
Methylcyclohexane	108-87-2	5035A	EPA8260B	2,600
Styrene	100-42-5	5035A	EPA8260B	0.72
Tetrachloroethylene (PCE)	127-18-4	5035A	EPA8260B	1.42
Toluene	108-88-3	5035A	EPA8260B	1.07
trans-1,2-Dichloroethylene	156-60-5	5035A	EPA8260B	2
trans-1,3-Dichloropropene	10061-02-6	5035A	EPA8260B	1.13
Trichloroethylene (TCE)	79-01-6	5035A	EPA8260B	1.37
Trichlorofluoromethane	75-69-4	5035A	EPA8260B	2
o-Xylene	95-47-6	5035A	EPA8260B	3.11
m,p-Xylene	MPXYL	5035A	EPA8260B	5
Bromochloromethane	74-97-5	5035A	EPA8260B	5
1,4-Dioxane	123-91-1	5035A	EPA8260B	100
1,2-Dichlorobenzene	95-50-1	5035A	EPA8260B	5
1,2,3-Trichlorobenzene	87-61-6	5035A	EPA8260B	5

A) Extraction and preparation methods differ depending upon media, concentration, instrument, laboratory, and analytical method. Preparation methods will also influence detection limits.
B) CRDL is the contract required detection limit and is not always attainable.
C) Laboratory instructed to obtain the lowest possible method detection limit.

Table 4. Minimum Field Quality Control/Quality Assurance Sampling Requirements

Data Quality Level	Field Quality Control/Quality Assurance Samples	Frequency of Field Quality Control/ Quality Assurance Sample
UU	None	
VU	None	
VV	Co-located Field Duplicate	Minimum 5%[2]
	Trip Blank	Minimum 1 per cooler
	Equipment Blank	1 per 40 samples[3]
	Field Blank	Optional; 1 per 40 samples[4]
	Split Sample	Minimum 5%
SD[1]	Co-located Field Duplicate	Minimum 5%[2]
	Trip Blank	1 per cooler
	Equipment Blank	1 per 40 samples[3]
	Field Blank	Optional; 1 per 40 samples[4]
	Split Sample	Minimum 5%
D	Co-located Field Duplicate	Minimum 5%[2]
	Trip Blank	1 per cooler
	Equipment Blank	1 per 40 samples[3]
	Field Blank	Optional; 1 per 40 samples[4]
	Split Sample	Minimum 5%

Data Quality Levels
UU Data Unverified and Unvalidated Data (no errors from CEDMS database loading screens)
VU Data Verified and Unvalidated Data (includes missing data checks)
VV Data Verified and Validated Data (validated to automated criteria; equivalent to USEPA Screening Level Data)
SD Data USEPA Screening Level Data with 10% Definitive Confirmation Data USEPA Definitive Level Data
D Data USEPA Definitive Level Data

Footnotes:
1. Level of data quality used in this work plan
2. Minimum frequency established per ER-SOP-043
3. Typical frequency
4. Recommended based on project needs; typical frequency

Table 5. Preservatives, Holding Times, and Sample Containers

Parameter	Preservatives		Holding Time		Containers	
	Aqueous	Solid	Aqueous	Solid	Aqueous	Solid
Volatile Organic Compounds (VOCs) Including: 8260 – VOCs	No Residual Chlorine Adjust pH to <2 with H_2SO_4, HCL, or solid sodium bisulfate ($NaHSO_4$). Cool to 4°C	Low-level soil Add ~5 g soil to 40 mL VOA vial preserved with 1 g of $NaHSO_4$/5 mL water	14 days	Low/High Level 14 days	3x40 mL glass VOC vial, PTFE septa cap	3x40 (or 60) mL glass VOA vial (with stir bar for low-level soil), PTFE septa cap
Extractable Organics Including: 8270 – Semivolatile Organics	No Residual Chlorine Cool to 4°C	Cool to 4°C	7 days until extraction/ analyzed within 40 days after extraction	14 days until extraction/ analyze d within 40 days after extraction	2 x 1 L amber glass bottle per chemical parameter	250 mL CWM
8082 – Polychlorinated Biphenyls 8310 – Polycyclic Aromatic Hydrocarbons	Extracts must be stored at 4°C and in the dark until analysis. Extracts must be stored at 4°C and in the dark until analysis	Cool to 4°C	7 days until extraction/ analyzed within 40 days after extraction	14 days until extraction/ analyzed within 40 days after extraction	2 x 1 L amber glass bottle per chemical parameter	250 mL CWM
Metals (except Mercury [Hg])	HNO_3 to pH <2	Cool to 4°C	6 months	6 months	1 L HDPE	250 mL CWM (metals and cyanide may be collected in the same container for soils)
Hg	HNO_3 to pH <2	Cool to 4°C	28 days	28 days	250 mL HDPE or glass	250 mL CWM

Abbreviations used in Table:

g = gram
L = liter
mL = milliliter
VOA = volatile organic analysis
H_2SO_4 = sulfuric acid
HCL = hydrochloric acid
$NaHSO_4$ = sodium bisulfate
PTFE = teflon lined seals
CWM = clear wide-mouth glass jar
HNO_3 = nitric acid
HDPE = high-density polyethylene plastic bottle

Table 6. Automotive Repair Shop (716-A) OU Sample Matrix

Sample Type[1]	Station	Top Depth (ft beneath concrete slab)	Bottom Depth (ft beneath concrete slab)	Media	Sample Method	Analyses
REG	ARS-001-SB	0	5	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-001-SB	5	10	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-001-SB	10	15	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-001-SB	15	20	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-001-SB	20	25	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-001-SB	25	30	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-001-SB	30	35	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-001-SB	35	40	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-001-SB	40	45	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-001-SB	45	50	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-002-SB	0	5	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-002-SB	5	10	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-002-SB	10	15	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-002-SB	15	20	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-002-SB	20	25	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-002-SB	25	30	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-002-SB	30	35	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-002-SB	35	40	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-002-SB	40	45	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-002-SB	45	50	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-003-SB	0	5	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-003-SB	5	10	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-003-SB	10	15	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)

Table 6. Automotive Repair Shop (716-A) OU Sample Matrix (*Continued*)

Sample Type[1]	Station	Top Depth (ft beneath concrete slab)	Bottom Depth (ft beneath concrete slab)	Media	Sample Method	Analyses
REG	ARS-003-SB	15	20	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-003-SB	20	25	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-003-SB	25	30	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-003-SB	30	35	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-003-SB	35	40	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-003-SB	40	45	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-003-SB	45	50	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-004-SB	0	5	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-004-SB	5	10	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-004-SB	10	15	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-004-SB	15	20	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-004-SB	20	25	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-004-SB	25	30	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-004-SB	30	35	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-004-SB	35	40	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-004-SB	40	45	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-004-SB	45	50	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	0	5	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	5	10	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	10	15	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	15	20	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	20	25	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	25	30	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	30	35	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)

Table 6. Automotive Repair Shop (716-A) OU Sample Matrix (*Continued*)

Sample Type[1]	Station	Top Depth (ft beneath concrete slab)	Bottom Depth (ft beneath concrete slab)	Media	Sample Method	Analyses
REG	ARS-005-SB	35	40	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	40	45	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	45	50	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	50	60	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	60	70	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	70	80	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	80	90	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	90	100	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	100	110	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	110	120	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	120	130	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	130	140	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	140	150	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-005-SB	150	160	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-006-SB	0	5	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-006-SB	5	10	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-006-SB	10	15	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-006-SB	15	20	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-006-SB	20	25	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-006-SB	25	30	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-006-SB	30	35	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-006-SB	35	40	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)
REG	ARS-006-SB	40	45	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)

Table 6. Automotive Repair Shop (716-A) OU Sample Matrix (*Continued/End*)

Sample Type[1]	Station	Top Depth (ft beneath concrete slab)	Bottom Depth (ft beneath concrete slab)	Media	Sample Method	Analyses
REG	ARS-006-SB	45	50	Soil	Rotosonic (or equivalent)	TAL/TCL (excluding pesticides and herbicides)

1. Field Duplicates (FD), Equipment/Rinsate Blanks (RB), and Split samples (SPL) are not shown but will be produced during work planning stage. Trip Blanks (TB) are not shown but will be sent with each shipment of VOCs. Table 4 summarizes the number of Quality Control/Quality Assurance (QC/QA) samples needed.

Table7. Automotive Repair Shop (716-A) OU Implementation Schedule

Deliverable	Projected Submittal/Start Date
RI Work Plan Field Start	September 30, 2024
Submit Rev. 0 RI/BRA Report	March 11, 2025
Submit Rev. 0 Feasibility Study Report	November 25, 2025
Submit Rev. 0 Proposed Plan	July 14, 2026
Submit Rev. 0 Record of Decision	January 15, 2027
Issue Record of Decision	September 30, 2027
Submit Rev. 0 Remedial Action Implementation Plan	October 18, 2027
Submit Rev. 0 Land Use Control Implementation Plan	October 18, 2027
Remedial Action Start	December 12, 2028

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