ENVIRONMENTAL SITE INVESTIGATION
BUILDINGS 108A AND 108B
PRELIMINARY REPORT

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SECTION 1

INTRODUCTION

At the request of the U.S. General Services Administration (GSA), SCS Engineers (SCS) initiated the performance of a Preliminary Assessment (PA)/Site Investigation (SI) of the Saint Louis Federal Center located at 4300 Goodfellow Boulevard, Saint Louis, Missouri (Property). This preliminary report summarizes the results of the SI conducted to date in the area of Buildings 108A and108B on the Property. Our findings based on these results can be relied upon by GSA as to the conditions that currently exist, but are not intended for use by others at a later date.

PRELIMINARY ASSESSMENT

In 2002, SCS Engineers initiated a PA of the facility including a detailed site inspection of Buildings 108A and 108B. Specific attention to Recognized Environmental Concerns associated with the future occupancy of buildings at the facility was emphasized. The PA process was performed, based on the sites former use, in combination with the future occupancy of the buildings by Federal office workers. The PA process identified the need for a facility SI. A separate PA Report has been prepared by SCS which documents the findings of the PA. The PA also identified the need for a removal action associated with the shooting range in the basement of Building 105. Concerns regarding the presence of lead associated with the firing range and the potential for human exposure or a release to the environment necessitated the removal action. The Shooting Range Remediation project was completed by SCS and has been documented in a Removal Action Report.

Other suspect environmental concerns were identified during the PA and subsequent data review process. These suspect environmental concerns are associated with the former use of the Federal Center as a munitions manufacturing facility and include potential environmental impacts to the Property by hazardous chemicals. The PA/SI process, as designed by the U.S. Environmental Protection Agency (EPA), addresses these potential concerns. This includes a detailed assessment of former and current activities at the Property, and it includes intrusive sampling of all identified concerns. During the performance of the PA/SI, potential environmental concerns were identified and assessed. The typical PA/SI Scope of Work includes conducting a file review, performance of a thorough site inspection, development of a sampling plan, execution of the data acquisition and analysis, and the interpretation and reporting of the results. The goals of the PA/SI process are to determine if a release of hazardous substances has occurred, if the hazardous substances are of sufficient toxicity and quantity to represent a risk to human health and the environment, and determine if human or environmental targets have or have the potential to be exposed to the hazardous substances at the site. The performance of a PA/SI at the Property provides a thorough understanding of the environmental conditions at the Federal Center.

SITE INVESTIGATION PURPOSE

The purpose of this investigation was to screen the Property for potential environmental impacts from on-site activities, past Property use, and/or surrounding properties. The protocol for the investigation is based on the "Guidance For Performing Site Investigations Under [Comprehensive Environmental Response, Compensation, and Liability Act] CERCLA, EPA540-R-92-021, September 1992." An SI is intended to:

- Eliminate from consideration those sites that pose no threat to public health and environment.
- Determine the need for a removal action.
- Set priorities for future investigations.
- Gather existing or additional data to facilitate later components of the site assessment process.

A scope of work was developed to assist SCS in collecting defensible data to make informed decisions as to whether the site poses a threat to public health and environment. The scope of work performed by SCS included the collection of wipe samples of interior surfaces, collection of shallow soil samples in the basement level of buildings, collection of sediment samples from interior drains and pits, collection of sediment samples from process piping and storm sewer inlets, collection of tunnel sediment and water samples, the collection of subsurface soil samples using direct-push probing technology, and collection of indoor ambient air samples. Sample locations were selected as a part of a detailed sampling strategy designed to eliminate concern over occupation of the building by Federal office workers.

SITE DESCRIPTION AND HISTORICAL USE

The 4300 Goodfellow Federal Center is located on a portion of the former Saint Louis Ordnance Plant (SLOP) in Saint Louis, Missouri. In January 1941, construction of the SLOP began and was completed in May 1942. SLOP was the largest small-arms ammunition installation in the world and embodied three operating divisions. The facility, a Government-Owned/Contractor Operated (GOCO) plant, produced small arms ammunition (.30 caliber and .50 caliber) and components for the 105-millimeter (mm) shells. Plant No. 1 was located on the east side of Goodfellow Boulevard. During World War II, Building 108A served as the south primary power substation, and Building 108B served as the north primary power substation. These buildings each house two power transformers.

The Department of Defense converted the Property in the 1960's and 1970's to a Federal Office Complex under the management of GSA. The Department of Defense (DoD) reportedly spent in

excess of $50 million dollars in demolition, grading, disposal, and remodeling costs. The four primary munitions manufacturing buildings (102, 103, 104, and 105) were decommissioned and converted into office and warehouse space. The grounds surrounding the buildings were graded and converted into parking and greenspace. The Federal Center has been utilized for over 20 years as a Federal Office Center whose primary tenants have included GSA, U.S. Department of Agriculture (USDA), and the DoD.

SECTION 2

WIPE SAMPLING

In December 2003, three wipe samples were collected in Building 108A and two wipe samples were collected in Building 108B for laboratory analysis. Wipe sample locations were selected at random within each defined area. Defined areas were established based on proximity to potential hazard exposure, proximity to process areas, or spatial considerations. Wipe samples were collected using American Society for Testing & Materials (ASTM), Occupational Safety and Health Administration (OSHA), and U.S. Department of Housing and Urban Development (HUD) protocols. All wipe samples were collected from an area 100 cm^2 using cut gauze pads containing appropriate solvent/preservatives (polychlorinated biphenyls-hexane).

LOGGING OF SAMPLE PARAMETERS

All sample locations were documented in the field log and pictures of the sample locations were taken.

WIPE SAMPLE COLLECTION

Each wipe sample was collected from a predetermined location. Wipe samples were collected from exposed walls, concrete floors, and from exposed steel ceiling girders depending on sample location. All wipe samples were collected by removing the pre-soaked gauze pad from the sample container and wiping an area of approximately 100 cm^2. Upon collection, wipe samples were immediately stored in the same laboratory-supplied jars for analysis. Once capped and sealed, sample containers were placed on ice in a cooler, and held until the end of the day of field investigation. At the end of the day of field investigation, the sample containers were shipped on ice under a proper chain-of-custody via overnight express delivery service to Severn Trent Laboratories (STL) in University Park, Illinois.

CHEMICAL ANALYSIS

The wipe samples were analyzed for polychlorinated biphenyls (PCBs) by Method 8082. The following table presents a summary of analytical results from the collected wipe samples within Building 108A. Only analytes with reported concentrations above laboratory quantitative limits are listed.

SAMPLE NUMBER:		108A WS-1	108A WS-2	108A WS-3	SOIL
SAMPLE DATE:		12/18/2003	12/18/2003	12/18/2003	TARGET
LAB ID NUMBER:		223220-10	223220-11	223220-12	CONCENTRATIONS
					SCENARIO A[1]
PARAMETER (METHOD)	UNITS				
PCBs (8082)					
Aroclor 1260	µg/Wipe	ND	ND	0.3	600 µg/Kg
µg/Wipe = micrograms per wipe		µg/Kg = micrograms per kilogram			
[1]Target Concentration based on the CALM STARC Scenario A, as directed by personel in the Federal Facility Section of MDNR					

The following table presents a summary of analytical results from the collected wipe samples within Building 108B. Only analytes with reported concentrations above laboratory quantitative limits are listed.

SAMPLE NUMBER:		108B WS-1	108B WS-2	SOIL
SAMPLE DATE:		12/18/2003	12/18/2003	TARGET
LAB ID NUMBER:		223220-13	223220-14	CONCENTRATIONS
				SCENARIO A[1]
PARAMETER (METHOD)	UNITS			
PCBs (8082)				
Aroclor 1260	µg/Wipe	0.33	ND	600 µg/Kg
µg/Wipe = micrograms per wipe		µg/Kg = micrograms per kilogram		
[1]Target Concentration based on the CALM STARC Scenario A, as directed by personel in the Federal Facility Section of MDNR				

The EPA and Missouri Department of Natural Resources (MDNR) do not have established maximum contaminant levels (MCLs) or target concentrations for compounds detected by wipe sampling. However, representatives from the MDNR use the Cleanup Levels for Missouri (CALM) Soil Target Concentrations (STARC) Scenario A as a benchmark standard for comparison. Exposure Scenario A applies to sites where no land-use restriction covenants are to be used and are the most restrictive in terms of cleanup goals.

Aroclor 1260 was detected in one wipe sample at a concentration of 0.3 micrograms per wipe (µg/Wipe) in Building 108A (108A WS-3) and in one wipe sample at a concentration of 0.33 µg/Wipe in Building 108B (108B WS-1). The Federal Toxic Substances Control Act (TSCA) defines acceptable levels of PCB Aroclors at 10 micrograms per square centimeter ($\mu g/cm^2$) for high density human occupation to 100 ug/cm^2 for low density human occupation.

No other PCBs were detected above laboratory quantitative limits in any of the wipe samples.

SECTION 3

SUBSURFACE SOIL SAMPLING

In December 2003, six soil borings were advanced at locations surrounding Building 108A and two soil borings were advance at locations surrounding Building 108B. Four of the six borings (SB1, SB2, SB3 and SB4) were placed near Building 108A and within the former location of Building 111, a natural gas fired boiler house. Borings SB39 and SB40 were placed near the north and east sides of Building 108A, respectively. Borings SB37 and SB38 were placed near the south and west sides of Building 108B, respectively. Borings SB1, SB2, SB3, SB4, and SB39 encountered probe refusal at a depth of nine feet below ground surface (bgs) and boring SB40 encountered refusal at a depth eight feet bgs. Borings SB37 and SB38 were advanced to their target depths of twenty feet bgs.

Probing was performed by Below Ground Service, Inc. (BGS) of Lawrence, Kansas. BGS performed direct-push soil sampling using a truck-mounted Geoprobe® unit equipped with a pneumatic hammer and hollow, two-inch diameter probe rods. At each location, continuous soil cores were collected using a continuous-barrel sampler two feet in length. Soil cores were removed from the sampler using disposable acetate liners. Subsurface soil cores were collected until the target depth of twenty feet bgs or refusal.

When the acetate liners were removed from the continuous-barrel sampler, a handheld photoionization detector (PID) was used to screen vapors for volatile organic compounds (VOCs) in the headspace above the soil core. No groundwater samples were collected.

LOGGING OF SUBSURFACE MATERIALS

The materials encountered in the borings were classified in the field for each boring by an SCS Geologist. The classification procedure included texture descriptions of soils according to the Unified Soil Classification System (USCS). Included in the descriptions are principal and minor soil constituents, moisture content, soil color, plasticity of cohesive soils, gradation of non-cohesive soils, consistency, and other visible features. In addition, unusual odors, discoloration, and other indicators of potential contamination were noted.

In general, the materials encountered at boring locations SB1, SB2, SB3, and SB4 consisted of a dry to moist, gravelly fill. Borings SB1, SB2, SB3, and SB4 intersected a concrete slab (believed to be the basement floor slab of former Building 111) at a depth of nine feet bgs, resulting in probe refusal. The material encountered at boring locations SB39 and SB40 generally consisted of varying amounts of dry to moist clay, sand, and gravel until refusal depths of nine and eight feet bgs, respectively. Soil cores from all six probe locations around Building 108A registered readings below the detection limits of the PID. No groundwater was encountered during the probing effort around Building 108A.

In general, the material encountered at boring locations SB37 and SB38 consisted of varying amounts of clay, sand, and gravel until their target depths of twenty feet bgs. Soil cores from the two probe locations around Building 108B registered readings below the detection limits of the PID. Notable increases in moisture content occurred at twelve feet bgs in both borings; however static groundwater levels were not identified during the probing effort around Building 108B.

SOIL SAMPLE COLLECTION

Discrete soil samples were extracted directly from the acetate liner and continuous-barrel sampler using a clean, decontaminated stainless steel utensil. Upon extraction from the acetate liners, soil samples were immediately stored in clean, laboratory-supplied jars for analysis. Once capped and sealed, sample containers were placed on ice in a cooler, and held until the end of the day of field investigation. At the end of the day of field investigation, the sample containers were shipped on ice under a proper chain-of-custody via overnight express delivery service to STL in University Park, Illinois.

Direct-push soil sampling at boring locations SB1, SB2, SB3, and SB4 recovered insufficient quantities of material suitable for laboratory testing for borings individually. Consequently, proportionate sample material from each of these borings was combined into a single composite sample. Soil samples recovered from borings SB37 through SB40 were of sufficient volume that individual samples were submitted from each location.

CHEMICAL ANALYSES

Soil samples were analyzed by STL for pre-selected analyses. Analyses were based on potential contaminants of concern associated with known building processes and historical review. Pre-selected analyses for samples collected around Building 108A included PCBs by Method 8082, total petroleum hydrocarbons (TPH) by Method 8015B MDRO, mercury by Method 7471A, and metals by Method 6010B. Pre-selected analyses for samples collected around Building 108B included PCBs by Method 8082 and TPH by Method 8015B MDRO. The following table presents a summary of analytical results from the soil samples collected around Building 108A. Only analytes with reported concentrations above laboratory quantitative limits are listed.

SAMPLE NUMBER:		SB1-SB4	SB39	SB40	SOIL
SAMPLE DATE:		12/15/2003	12/17/2003	12/17/2003	TARGET
LAB ID NUMBER:		223146-1	223218-22	223218-23	CONCENTRATIONS
					SCENARIO A
PARAMETER	**UNITS**				
PCBs (8082)					
Aroclor 1260	µg/Kg	ND	3900	1000	600 µg/Kg
TPH (8015B MDRO)					
Diesel Range Organics	mg/Kg	6	27	17	200 mg/Kg
MERCURY (7471A)					
Mercury	mg/Kg	0.011	NA	NA	0.6 mg/Kg
METALS (6010B)					
Aluminum	mg/Kg	770	NA	NA	NT
Arsenic	mg/Kg	0.81	NA	NA	11 mg/Kg
Barium	mg/Kg	20	NA	NA	14,000 mg/Kg
Beryllium	mg/Kg	0.047	NA	NA	0.05 mg/Kg
Cadmium	mg/Kg	0.24	NA	NA	110 mg/Kg
Calcium	mg/Kg	370000	NA	NA	NT
Chromium	mg/Kg	6.5	NA	NA	2,100 mg/Kg
Cobalt	mg/Kg	0.49	NA	NA	NT
Copper	mg/Kg	6.7	NA	NA	1,100 mg/Kg
Iron	mg/Kg	1200	NA	NA	NT
Lead	mg/Kg	ND	NA	NA	260 mg/Kg
Magnesium	mg/Kg	5100	NA	NA	NT
Manganese	mg/Kg	46	NA	NA	3,700 mg/Kg
Nickel	mg/Kg	4.2	NA	NA	4,800 mg/Kg
Potassium	mg/Kg	490	NA	NA	NT
Seleniun	mg/Kg	3.1	NA	NA	300 mg/Kg
Sodium	mg/Kg	310	NA	NA	NT
Thallium	mg/Kg	0.93	NA	NA	17 mg/Kg
Vanadium	mg/Kg	2.9	NA	NA	1,500 mg/Kg
Zinc	mg/Kg	9.1	NA	NA	38,000 mg/Kg

µg/Kg = micrograms per kilogram mg/Kg = milligrams per kilogram NA = Not Analyzed
NT = No Target Concentration

The following table presents a summary of analytical results from the soil samples collected around Building 108B. Only analytes with reported concentrations above laboratory quantitative limits are listed.

SAMPLE NUMBER:		SB37	SB38	SOIL
SAMPLE DATE:		12/17/2003	12/17/2003	TARGET
LAB ID NUMBER:		223218-20	223218-21	CONCENTRATIONS
				SCENARIO A
PARAMETER	**UNITS**			
TPH (8015B MDRO)				
Diesel Range Organics	mg/Kg	5.1	4.8	200 mg/Kg

µg/Kg = micrograms per kilogram mg/Kg = milligrams per kilogram

Aroclor 1260 was detected above the CALM STARC Scenario A screening level of 600 micrograms per kilogram (µg/Kg) at two boring locations near Building 108A. SB39 and SB40 had reported concentrations of 3,900 and 1,000 µg/Kg, respectively. Aroclor 1260 was below laboratory quantitative limits in the SB1-SB4 composite soil sample. No other PCBs were detected above laboratory quantitative limits in any of the soil samples collected from the six borings around Building 108A.

No PCBs were detected above laboratory quantitative limits in any of the soil samples collected around Building 108B.

TPH-diesel range organics (DRO) were detected below the CALM STARC screening level of 200 milligrams per kilogram (mg/Kg) in all of the samples. Reported DRO concentrations ranged from 6 to 27 mg/Kg in soil samples collected near Building 108A and 4.8 to 5.1 mg/Kg in soil samples collected near Building 108B.

All reported concentrations of mercury and metals were below the CALM STARC screening levels or below laboratory quantitative limits in the SB1-SB4 composite sample.

SECTION 4

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Based on the results of the work performed under the current scope-of-work, SCS makes the following conclusions:

- Aroclor 1260 was detected in one wipe sample in Building 108A and in one wipe sample in Building 108B at reported concentrations of 0.3 and 0.33 μg/Wipe, respectively.

- Aroclor 1260 concentrations exceeded the screening level in two soil samples collected at boring locations SB39 and SB40. Aroclor 1260 was below laboratory quantitative limits in the SB1-SB4 composite soil sample. No other PCBs were detected above laboratory quantitative limits in any of the soil samples collected from the six borings around Building 108A.

- No PCBs were detected above laboratory quantitative limits in any of the soil samples collected around Building 108B.

- TPH- DRO were detected below the CALM STARC Scenario A screening level of 200 mg/Kg in all of the soil samples collected around Buildings 108A and 108B

- All reported concentrations of metals were below the CALM STARC Scenario A screening levels or below laboratory quantitative limits in the SB1-SB4 composite soil sample.

RECOMMENDATIONS

Aroclor 1260 concentrations exceeded MDNR CALM STARC Scenarion A screening levels in soil samples collected near Building 108A. SCS recommends additional soil sampling around Building 108A to better define the nature and extent of the PCB impact. Up to twelve additional Geoprobe® borings are recommended to better identify PCB concentrations both vertically and horizontally around Building 108A. A maximum of two soil samples from each boring will be analyzed for PCBs by Method 8082.

In addition, SCS recommends installing up to twelve temporary groundwater monitoring points after boring advancement near Building 108A using small diameter schedule 40 polyvinylchloride (PVC) riser and screen. The purpose for monitoring point installation is to determine the elevation, direction, and gradient of groundwater near Building 108A and to

evaluate the potential for PCB groundwater contamination. If the monitoring points yield appreciable amounts of groundwater, SCS recommends collecting groundwater samples from up to six monitoring points. Groundwater samples will be analyzed for PCBs by Method 8082.

Historical analytical results contained in the memorandum dated February 1986 from John B. Platt to Benjamin H. Friedman indicated that soil and water near Building 108B has been impacted by PCBs. Although PCBs were not detected in samples collected from borings SB37 and SB38, SCS recommends additional soil sampling around Building 108B to define the nature and extent of the PCB impact. Up to six additional Geoprobe® borings are recommended identify PCB concentrations both vertically and horizontally around Building 108B. A maximum of two soil samples from each boring will be analyzed for PCBs by Method 8082.

In addition, SCS also recommends installing up to six temporary groundwater monitoring points after boring advancement near Building 108B using small diameter schedule 40 polyvinylchloride (PVC) riser and screen. The purpose for monitoring point installation is to determine the elevation, direction, and gradient of groundwater near Building 108B and to evaluate the potential for PCB groundwater contamination. If the monitoring points yield appreciable amounts of groundwater, SCS recommends collecting groundwater samples from up to three monitoring points. Groundwater samples will be analyzed for PCBs by Method 8082.

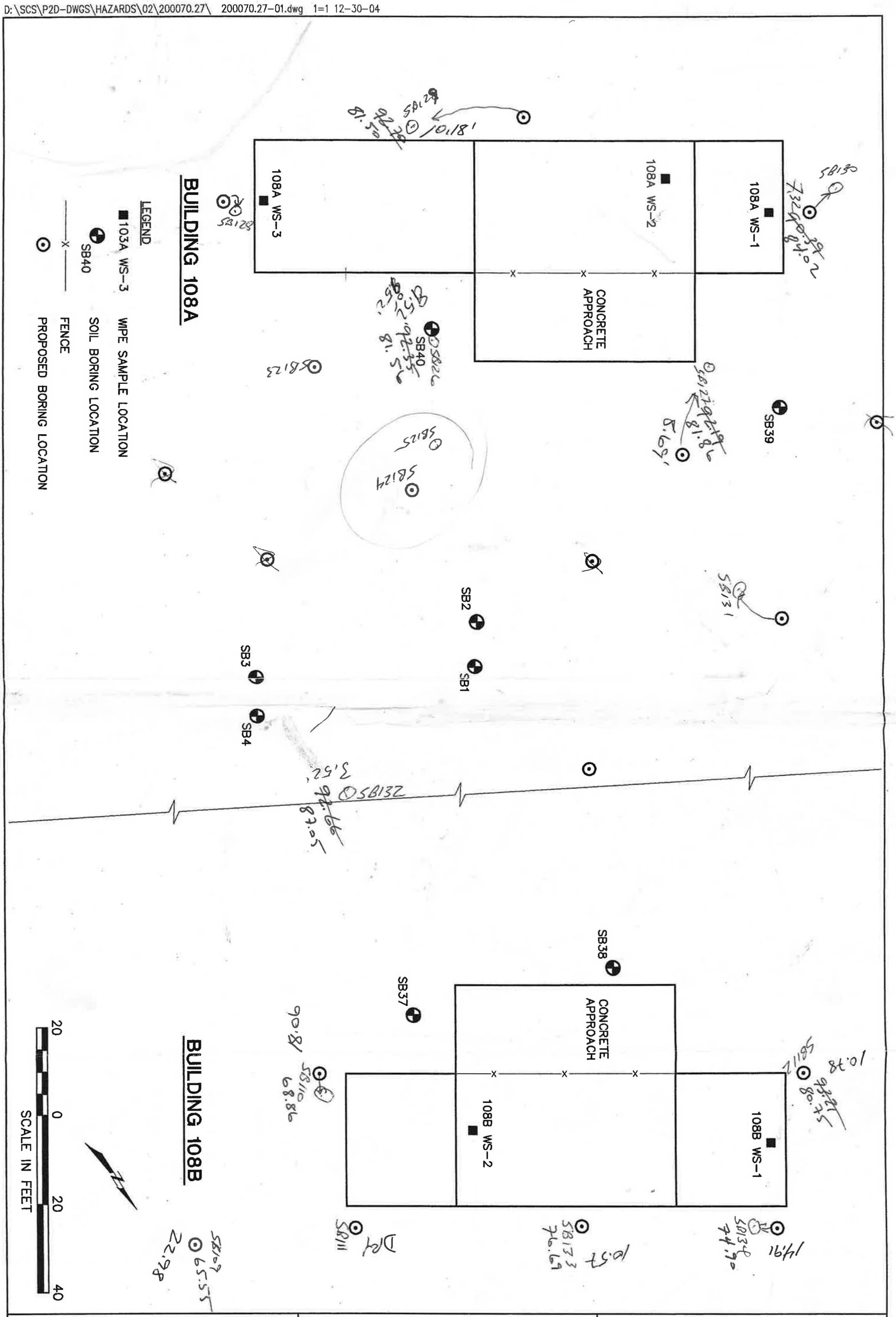
Recommendations for removal or encapsulation of impacted soils can be made following quantification of the contaminated areas. The cost estimate to perform the additional investigation in the area of Building 108A is $13,600, and the cost estimate to perform the additional investigation in the area of Building 108B is $10,700. These cost estimates each include the preparation of a Letter Report detailing the findings of each investigation for submittal to GSA. The Letter Report will include the following: Site Description, Data Collection and Sampling Protocols, Results of Field Screening Analysis, Results of Soil Sample Analysis, Generalized Site Plan showing sampling locations, and Conclusions. Up to a total nine additional groundwater samples collected from the monitoring points during either investigation can be analyzed for PCBs by Method 8082 for a cost of $305 per sample.

If the proposed investigation can be performed in conjunction with the investigations proposed for Buildings 108B, 104L, and 115, the cost estimate to perform the additional investigation in the area of Building 108A can be reduced to $10,400. Similarly, the cost estimate to perform the additional investigation in the area of Building 108B can be reduced to $8,200 if the proposed investigation can be performed in conjunction with the investigations proposed for Buildings 108A, 104L, and 115. Up to a total nine additional groundwater samples analyzed for PCBs still may be added to either investigation for a cost of $305 per sample.

APPENDIX A

FIGURES

D:\SCS\P2D-DWGS\HAZARDS\02\200070.27\ 200070.27-01.dwg 1=1 12-30-04



SCS ENGINEERS DSN. BY C. BAUDERS CHK. BY D. BREWER DWN. BY P. MORRIS REV:	BUILDINGS 108A AND 108B FORMER ST. LOUIS ORDNANCE PLANT 4300 GOODFELLOW BLVD. ST. LOUIS, MISSOURI PROJECT NO. 02200070.27 DECEMBER 2004	FIGURE 1 SAMPLE LOCATIONS

APPENDIX B

LABORATORY ANALYTICAL REPORTS

(LABORATORY ANALYTICAL REPORTS FURNISHED UPON REQUEST.)