



January 20, 2021

Diane Czarnecki  
Industrial Hygienist  
Facilities Management Division  
GSA Public Buildings Service – Heartland Region  
2300 Main Street  
Kansas City, MO 64108

Re: Goodfellow Federal Center  
Metals in Settled Dust Sampling – Building 103  
Project No. 121244

Dear Ms. Czarnecki:

Thank you for the opportunity to assist the General Services Administration (GSA) with the metals in settled dust sampling investigation of Building 103 located at the Goodfellow Federal Center (GFC) in St. Louis, Missouri. Burns & McDonnell understands that the purpose of the investigation was to provide additional sampling data of existing environmental conditions that are present at GFC that could adversely impact the health and safety of building occupants as well as workers at the facility. The following report summarizes the sample collection activities and the laboratory analytical results of samples submitted.

## **INTRODUCTION**

Per historical use and previous characterization, Burns & McDonnell was contracted to perform settled dust sampling for the analysis of seven (7) of the Resource Conservation and Recovery Act (RCRA) target metals (arsenic, barium, cadmium, chromium, lead, selenium, and silver) from various surfaces within buildings. The purpose of this testing was to further characterize the presence and concentration of target metals in common tenant-occupied areas of the building.

The proposed sampling scheme, the number of samples, the sample distribution and general methodology was developed by GSA and Burns & McDonnell. Specific sample locations were determined by sampling personnel while on-site.

Settled dust wipe sampling at Bldg. 103 was conducted on December 3, 2020 by Emily Ahlemeyer of Burns & McDonnell and Jeff Smith of OCCU-TEC.

## **METALS IN SETTLED DUST SAMPLING**

Metals in settled dust sampling was conducted primarily within tenant-occupied areas. Dust wipe sampling was conducted in accordance with ASTM Standard E1728: *Standard Practice for Collection of Settled Dust Samples Using Wipe Sampling Methods for Subsequent Lead Determination* and ASTM Standard D6966: *Standard Practice for Collection of Settled Dust Samples Using Wipe Sampling Methods for Subsequent Determination of Metals*. ASTM Standards E1728 and D6966 are consistent with the methodology described in the Housing and

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Urban Development Guidelines-Appendix 13.1 and 40 CFR 745.63. The Brookhaven National Laboratory's Surface Wipe Sampling Procedure (IH75190) was also used as a guideline.

Dust wipe sampling for the target metals was conducted on a variety of representative surfaces that have the potential of being disturbed by building occupants. In addition, basements, penthouses, and mechanical spaces were sampled. A representative surface area of approximately one square foot (1 SF) was measured and delineated with plastic templates. The dust wipe samples were collected using dedicated dust wipe cloths meeting ASTM E1792 Standard. Each dust wipe cloth was pre-moistened and individually wrapped. Each sample was collected by wiping in a back and forth "S" pattern over a measured sampling area using a clean, disposable glove. Then, the wipe was folded over itself and the area was wiped again in a direction perpendicular to the first wipe orientation. Then, the wipe folded over itself again and the area was wiped around the perimeter. The wipe sample was then placed into a labeled, clean container. Dust wipe samples were submitted to Environmental Hazards Services, LLC (EHS) in Richmond, Virginia for Inductively Coupled Plasma (ICP) analysis of metals analysis using Environmental Protection Agency (EPA) method SW846 3050B/6010D. EHS is accredited under the American Industrial Hygiene Association (AIHA) Laboratory Accreditation Program (LAP) identification number LAP-100420.

Whereas the Occupational Safety and Health Administration (OSHA) has not established regulatory limits for surface concentrations of metals, the OSHA Technical Manual Section II: Chapter 2 (III.A) describes a method for calculating "housekeeping" standards, as recommended acceptable surface limits. Brookhaven's IH75190 procedure uses the housekeeping standards to derive a lower, "clean area limit" for non-operational areas that can be accessed or contacted without special training or precautions. Burns & McDonnell calculated clean area limits for metals not included in the Brookhaven procedure, specifically barium, chromium (total), selenium and silver. Wipe results were compared to the Brookhaven procedure's clean area limits for each metal.

Results of the dust wipe samples collected from the building indicate that 22 of the 24 samples contained concentrations of target metals above laboratory reporting limits. The following table identifies the range of results for each of the seven metals that were analyzed. Samples with a "<" sign indicate that the results were below the lab's reportable limit.

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**Table 1. Summary of Dust Wipe Results**

Analyte	Lowest Concentration <sup>(a)</sup> (µg/sq. ft) <sup>(b)</sup>	Highest Concentration <sup>(a)</sup> (µg/sq. ft) <sup>(b)</sup>	Clean Area Limit <sup>(c)</sup> µg/sq. ft <sup>(b)</sup>
Silver	<0.3	0.8	62
Arsenic	<0.7	4.8	62
Barium	0.7	130.0	3,094
Cadmium	<0.1	3.4	31
Chromium (Total)	<0.8	33.0	3,094
Lead	<0.5	260.0	10 <sup>(d)</sup>
Selenium	<1.7	<2.5	1,236

- (a) Samples with a “<” sign indicate that the results were below the laboratory’s reporting limit.
- (b) µg/sq. ft = micrograms per square foot of surface area.
- (c) Clean Area Limit per Brookhaven IH75190=OSHA Housekeeping Limit [PEL (µg/m<sup>3</sup>) x 10 m<sup>3</sup>/100cm<sup>2</sup>] / 15.
- (d) Lead clean area limit: Brookhaven references EPA/HUD limit for floors, set at 10 µg/sq. ft. as of January 2020.

Four (4) samples exceeded the lead clean area limit. Samples 103-W-12, 103-W-13, 103-W-19, and 103-W-20 resulted in lead concentrations of 19, 77, 41, and 260 µg/sq. ft, respectively. The remaining target metal sample results were below housekeeping and clean area limits, as recommended and described by OSHA and the Brookhaven Procedure.

Burns & McDonnell appreciates the opportunity to work with the GSA on this project. Please contact us if you have any questions regarding this report or if we may be of any additional service.

Sincerely,

(b) (6)

Matt Shanahan, CHMM  
 Project Manager

- Attachments:
- Appendix A – Sample Summary Table
  - Appendix B – Laboratory Analysis Report
  - Appendix C – Licenses



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Information in Appendices B and C is not accessible for people using screen reader technology. If this information is required, it can be furnished upon request by contacting 816-223-6198 or [r6environmental@gsa.gov](mailto:r6environmental@gsa.gov).

**APPENDIX A – SAMPLE SUMMARY TABLE**

## Appendix A

### Sample Summary Table

Sample Number	Location	Area Description	Analyte	Result	Units	Clean Area Limit*
103-W-01	1st floor, column H4	Bottom shelf	Silver	< 0.50	µg/ft <sup>2</sup>	62
			Arsenic	< 1.0	µg/ft <sup>2</sup>	62
			Barium	4.0	µg/ft <sup>2</sup>	3,094
			Cadmium	< 0.10	µg/ft <sup>2</sup>	31
			Chromium	< 1.0	µg/ft <sup>2</sup>	3,094
			Lead	1.2	µg/ft <sup>2</sup>	10
			Selenium	< 2.5	µg/ft <sup>2</sup>	1,236
103-W-02	1st floor, column E3	Floor near door	Silver	< 0.50	µg/ft <sup>2</sup>	62
			Arsenic	< 1.0	µg/ft <sup>2</sup>	62
			Barium	1.9	µg/ft <sup>2</sup>	3,094
			Cadmium	< 0.10	µg/ft <sup>2</sup>	31
			Chromium	< 1.0	µg/ft <sup>2</sup>	3,094
			Lead	1.3	µg/ft <sup>2</sup>	10
			Selenium	< 2.5	µg/ft <sup>2</sup>	1,236
103-W-03	1st floor, column B5	Top of ice machine	Silver	0.60	µg/ft <sup>2</sup>	62
			Arsenic	< 1.0	µg/ft <sup>2</sup>	62
			Barium	5.9	µg/ft <sup>2</sup>	3,094
			Cadmium	0.20	µg/ft <sup>2</sup>	31
			Chromium	14	µg/ft <sup>2</sup>	3,094
			Lead	2.4	µg/ft <sup>2</sup>	10
			Selenium	< 2.5	µg/ft <sup>2</sup>	1,236

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Sample Number	Location	Area Description	Analyte	Result	Units	Clean Area Limit*
103-W-04	1st floor, column B12	Elevator threshold	Silver	< 0.50	µg/ft <sup>2</sup>	62
			Arsenic	< 1.0	µg/ft <sup>2</sup>	62
			Barium	8.6	µg/ft <sup>2</sup>	3,094
			Cadmium	< 0.10	µg/ft <sup>2</sup>	31
			Chromium	< 1.0	µg/ft <sup>2</sup>	3,094
			Lead	0.83	µg/ft <sup>2</sup>	10
			Selenium	< 2.5	µg/ft <sup>2</sup>	1,236
103-W-05	1st floor, column F15	Floor	Silver	< 0.50	µg/ft <sup>2</sup>	62
			Arsenic	< 1.0	µg/ft <sup>2</sup>	62
			Barium	3.1	µg/ft <sup>2</sup>	3,094
			Cadmium	< 0.10	µg/ft <sup>2</sup>	31
			Chromium	1.1	µg/ft <sup>2</sup>	3,094
			Lead	1.7	µg/ft <sup>2</sup>	10
			Selenium	< 2.5	µg/ft <sup>2</sup>	1,236
103-W-06	2nd floor, column J13	Windowsill	Silver	< 0.38	µg/ft <sup>2</sup>	62
			Arsenic	< 0.76	µg/ft <sup>2</sup>	62
			Barium	1.5	µg/ft <sup>2</sup>	3,094
			Cadmium	0.11	µg/ft <sup>2</sup>	31
			Chromium	< 0.76	µg/ft <sup>2</sup>	3,094
			Lead	1.3	µg/ft <sup>2</sup>	10
			Selenium	< 1.9	µg/ft <sup>2</sup>	1,236

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Sample Number	Location	Area Description	Analyte	Result	Units	Clean Area Limit*
103-W-07	2nd floor, column G6	Break room floor	Silver	< 0.50	µg/ft <sup>2</sup>	62
			Arsenic	< 1.0	µg/ft <sup>2</sup>	62
			Barium	4.4	µg/ft <sup>2</sup>	3,094
			Cadmium	< 0.10	µg/ft <sup>2</sup>	31
			Chromium	< 1.0	µg/ft <sup>2</sup>	3,094
			Lead	0.96	µg/ft <sup>2</sup>	10
			Selenium	< 2.5	µg/ft <sup>2</sup>	1,236
103-W-08	2nd floor, column B12	Hallway floor	Silver	< 0.50	µg/ft <sup>2</sup>	62
			Arsenic	< 1.0	µg/ft <sup>2</sup>	62
			Barium	2.4	µg/ft <sup>2</sup>	3,094
			Cadmium	< 0.10	µg/ft <sup>2</sup>	31
			Chromium	< 1.0	µg/ft <sup>2</sup>	3,094
			Lead	0.74	µg/ft <sup>2</sup>	10
			Selenium	< 2.5	µg/ft <sup>2</sup>	1,236
103-W-09	1st floor, column J34	Hallway floor	Silver	< 0.50	µg/ft <sup>2</sup>	62
			Arsenic	< 1.0	µg/ft <sup>2</sup>	62
			Barium	3.4	µg/ft <sup>2</sup>	3,094
			Cadmium	0.34	µg/ft <sup>2</sup>	31
			Chromium	< 1.0	µg/ft <sup>2</sup>	3,094
			Lead	1.7	µg/ft <sup>2</sup>	10
			Selenium	< 2.5	µg/ft <sup>2</sup>	1,236



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### Sample Summary Table

Sample Number	Location	Area Description	Analyte	Result	Units	Clean Area Limit*
103-W-10	1st floor, column E31	Top of locker	Silver	< 0.44	µg/ft <sup>2</sup>	62
			Arsenic	2.0	µg/ft <sup>2</sup>	62
			Barium	85	µg/ft <sup>2</sup>	3,094
			Cadmium	0.45	µg/ft <sup>2</sup>	31
			Chromium	2.0	µg/ft <sup>2</sup>	3,094
			Lead	2.5	µg/ft <sup>2</sup>	10
			Selenium	< 2.2	µg/ft <sup>2</sup>	1,236
103-W-11	1st floor, column B31	Top of radiator	Silver	< 0.33	µg/ft <sup>2</sup>	62
			Arsenic	< 0.67	µg/ft <sup>2</sup>	62
			Barium	9.5	µg/ft <sup>2</sup>	3,094
			Cadmium	0.36	µg/ft <sup>2</sup>	31
			Chromium	2.4	µg/ft <sup>2</sup>	3,094
			Lead	8.2	µg/ft <sup>2</sup>	10
			Selenium	< 1.7	µg/ft <sup>2</sup>	1,236
103-W-12	1st floor, column B33	Freight elevator threshold	Silver	< 0.50	µg/ft <sup>2</sup>	62
			Arsenic	< 1.0	µg/ft <sup>2</sup>	62
			Barium	8.8	µg/ft <sup>2</sup>	3,094
			Cadmium	0.34	µg/ft <sup>2</sup>	31
			Chromium	3.1	µg/ft <sup>2</sup>	3,094
			Lead	19 **	µg/ft <sup>2</sup>	10
			Selenium	< 2.5	µg/ft <sup>2</sup>	1,236

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### Sample Summary Table

Sample Number	Location	Area Description	Analyte	Result	Units	Clean Area Limit*
103-W-13	1st floor, column B34	Floor in SE corner of mechanical room	Silver	0.52	µg/ft <sup>2</sup>	62
			Arsenic	< 1.0	µg/ft <sup>2</sup>	62
			Barium	23	µg/ft <sup>2</sup>	3,094
			Cadmium	0.93	µg/ft <sup>2</sup>	31
			Chromium	3.5	µg/ft <sup>2</sup>	3,094
			Lead	77 **	µg/ft <sup>2</sup>	10
			Selenium	< 2.5	µg/ft <sup>2</sup>	1,236
103-W-14	1st floor, column F39	Floor inside door to 103F	Silver	< 0.50	µg/ft <sup>2</sup>	62
			Arsenic	< 1.0	µg/ft <sup>2</sup>	62
			Barium	4.3	µg/ft <sup>2</sup>	3,094
			Cadmium	< 0.10	µg/ft <sup>2</sup>	31
			Chromium	1.5	µg/ft <sup>2</sup>	3,094
			Lead	2.7	µg/ft <sup>2</sup>	10
			Selenium	< 2.5	µg/ft <sup>2</sup>	1,236
103-W-15	1st floor, column D36	Storage room floor	Silver	< 0.50	µg/ft <sup>2</sup>	62
			Arsenic	< 1.0	µg/ft <sup>2</sup>	62
			Barium	1.0	µg/ft <sup>2</sup>	3,094
			Cadmium	< 0.10	µg/ft <sup>2</sup>	31
			Chromium	< 1.0	µg/ft <sup>2</sup>	3,094
			Lead	0.70	µg/ft <sup>2</sup>	10
			Selenium	< 2.5	µg/ft <sup>2</sup>	1,236

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**Sample Summary Table**

Sample Number	Location	Area Description	Analyte	Result	Units	Clean Area Limit*
103-W-16	1st floor, column C35	Top of shelf	Silver	< 0.50	µg/ft <sup>2</sup>	62
			Arsenic	< 1.0	µg/ft <sup>2</sup>	62
			Barium	1.4	µg/ft <sup>2</sup>	3,094
			Cadmium	< 0.10	µg/ft <sup>2</sup>	31
			Chromium	< 1.0	µg/ft <sup>2</sup>	3,094
			Lead	< 0.50	µg/ft <sup>2</sup>	10
			Selenium	< 2.5	µg/ft <sup>2</sup>	1,236
103-W-17	2nd floor, column G34/G35	Top of cubicle	Silver	< 0.50	µg/ft <sup>2</sup>	62
			Arsenic	< 1.0	µg/ft <sup>2</sup>	62
			Barium	0.85	µg/ft <sup>2</sup>	3,094
			Cadmium	< 0.10	µg/ft <sup>2</sup>	31
			Chromium	< 1.0	µg/ft <sup>2</sup>	3,094
			Lead	< 0.50	µg/ft <sup>2</sup>	10
			Selenium	< 2.5	µg/ft <sup>2</sup>	1,236
103-W-18	2nd floor, column B31	Roof access threshold	Silver	< 0.50	µg/ft <sup>2</sup>	62
			Arsenic	< 1.0	µg/ft <sup>2</sup>	62
			Barium	8.2	µg/ft <sup>2</sup>	3,094
			Cadmium	0.24	µg/ft <sup>2</sup>	31
			Chromium	2.3	µg/ft <sup>2</sup>	3,094
			Lead	7.4	µg/ft <sup>2</sup>	10
			Selenium	< 2.5	µg/ft <sup>2</sup>	1,236

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### Sample Summary Table

Sample Number	Location	Area Description	Analyte	Result	Units	Clean Area Limit*
103-W-19	Penthouse near column B32	Floor at west door	Silver	< 0.50	µg/ft <sup>2</sup>	62
			Arsenic	< 1.0	µg/ft <sup>2</sup>	62
			Barium	24	µg/ft <sup>2</sup>	3,094
			Cadmium	0.87	µg/ft <sup>2</sup>	31
			Chromium	4.8	µg/ft <sup>2</sup>	3,094
			Lead	41 **	µg/ft <sup>2</sup>	10
			Selenium	< 2.5	µg/ft <sup>2</sup>	1,236
103-W-20	Basement	West entrance floor	Silver	0.78	µg/ft <sup>2</sup>	62
			Arsenic	4.8	µg/ft <sup>2</sup>	62
			Barium	130	µg/ft <sup>2</sup>	3,094
			Cadmium	3.4	µg/ft <sup>2</sup>	31
			Chromium	33	µg/ft <sup>2</sup>	3,094
			Lead	260 **	µg/ft <sup>2</sup>	10
			Selenium	< 2.5	µg/ft <sup>2</sup>	1,236
103-W-21	Field blank	--	Silver	< 0.500	µg	--
			Arsenic	< 1.00	µg	--
			Barium	< 0.500	µg	--
			Cadmium	< 0.100	µg	--
			Chromium	< 1.00	µg	--
			Lead	< 0.500	µg	--
			Selenium	< 2.50	µg	--

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**Sample Summary Table**

Sample Number	Location	Area Description	Analyte	Result	Units	Clean Area Limit*
103-W-22	Field blank	--	Silver	< 0.500	µg	--
			Arsenic	< 1.00	µg	--
			Barium	< 0.500	µg	--
			Cadmium	< 0.100	µg	--
			Chromium	< 1.00	µg	--
			Lead	< 0.500	µg	--
			Selenium	< 2.50	µg	--
103-W-23	2nd floor, column C39	Top of desk	Silver	< 0.50	µg/ft <sup>2</sup>	62
			Arsenic	< 1.0	µg/ft <sup>2</sup>	62
			Barium	0.68	µg/ft <sup>2</sup>	3,094
			Cadmium	< 0.10	µg/ft <sup>2</sup>	31
			Chromium	< 1.0	µg/ft <sup>2</sup>	3,094
			Lead	< 0.50	µg/ft <sup>2</sup>	10
			Selenium	< 2.5	µg/ft <sup>2</sup>	1,236
103-W-24	2nd floor, Census break room	Floor near ice machine	Silver	< 0.50	µg/ft <sup>2</sup>	62
			Arsenic	< 1.0	µg/ft <sup>2</sup>	62
			Barium	2.5	µg/ft <sup>2</sup>	3,094
			Cadmium	< 0.10	µg/ft <sup>2</sup>	31
			Chromium	< 1.0	µg/ft <sup>2</sup>	3,094
			Lead	1.3	µg/ft <sup>2</sup>	10
			Selenium	< 2.5	µg/ft <sup>2</sup>	1,236

\* Clean Area Limit per Brookhaven IH75190=OSHA Housekeeping Limit [ $PEL (\mu\text{g}/\text{m}^3) \times 10 \text{ m}^3/100\text{cm}^2$ ] / 15. Lead clean area limit: Brookhaven references EPA/HUD limit for floors, set at 10 µg/sq. ft. as of January 2020.

\*\* Indicates results at or above the Clean Area Limit

**APPENDIX B – LABORATORY ANALYSIS REPORT**



Environmental Hazards Services, L.L.C.  
 7469 Whitepine Rd  
 Richmond, VA 23237  
 Telephone: 800.347.4010

## Wipe Metals Analysis Report

Client: Burns & McDonnell Engineering  
 9400 Ward Pkwy.  
 Kansas City, MO 64114

Report Number: 20-12-00738  
 Received Date: 12/07/2020  
 Analyzed Date: 12/08/2020  
 Reported Date: 12/10/2020

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; 103-W-01-103-W-22

Client Number:  
 26-3514

# Laboratory Results

Fax Number:  
 816-822-3494

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft <sup>2</sup> )	Total Metal (ug)	Concentration (ug/ft <sup>2</sup> )	Narrative ID
20-12-00738-001	103-W-01	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	3.98	4.0	L01
		Cadmium (Cd)	1.00	<0.100	<0.10	L01
		Chromium (Cr)	1.00	<1.00	<1.0	L01
		Lead (Pb)	1.00	1.18	1.2	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
20-12-00738-002	103-W-02	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	1.88	1.9	L01
		Cadmium (Cd)	1.00	<0.100	<0.10	L01
		Chromium (Cr)	1.00	<1.00	<1.0	L01

# Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 20-12-00738

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; 103-W-01-103-W-22

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft <sup>2</sup> )	Total Metal (ug)	Concentration (ug/ft <sup>2</sup> )	Narrative ID
		Lead (Pb)	1.00	1.32	1.3	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
20-12-00738-003	103-W-03	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	5.94	5.9	L01
		Cadmium (Cd)	1.00	0.205	0.20	L01
		Chromium (Cr)	1.00	13.7	14	L01
		Lead (Pb)	1.00	2.44	2.4	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	0.595	0.60	L01
20-12-00738-004	103-W-04	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	8.57	8.6	L01
		Cadmium (Cd)	1.00	<0.100	<0.10	L01
		Chromium (Cr)	1.00	<1.00	<1.0	L01
		Lead (Pb)	1.00	0.830	0.83	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
20-12-00738-005	103-W-05	Arsenic (As)	1.00	<1.00	<1.0	L01



# Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 20-12-00738

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; 103-W-01-103-W-22

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft <sup>2</sup> )	Total Metal (ug)	Concentration (ug/ft <sup>2</sup> )	Narrative ID
		Barium (Ba)	1.00	3.12	3.1	L01
		Cadmium (Cd)	1.00	<0.100	<0.10	L01
		Chromium (Cr)	1.00	1.12	1.1	L01
		Lead (Pb)	1.00	1.74	1.7	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
20-12-00738-006	103-W-06	Arsenic (As)	1.31	<1.00	<0.76	L01
		Barium (Ba)	1.31	2.00	1.5	L01
		Cadmium (Cd)	1.31	0.145	0.11	L01
		Chromium (Cr)	1.31	<1.00	<0.76	L01
		Lead (Pb)	1.31	1.74	1.3	L01
		Selenium (Se)	1.31	<2.50	<1.9	L01
		Silver (Ag)	1.31	<0.500	<0.38	L01
20-12-00738-007	103-W-07	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	4.40	4.4	L01
		Cadmium (Cd)	1.00	<0.100	<0.10	L01
		Chromium (Cr)	1.00	<1.00	<1.0	L01
		Lead (Pb)	1.00	0.965	0.96	L01

# Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 20-12-00738

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; 103-W-01-103-W-22

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft <sup>2</sup> )	Total Metal (ug)	Concentration (ug/ft <sup>2</sup> )	Narrative ID
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
20-12-00738-008	103-W-08	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	2.44	2.4	L01
		Cadmium (Cd)	1.00	<0.100	<0.10	L01
		Chromium (Cr)	1.00	<1.00	<1.0	L01
		Lead (Pb)	1.00	0.745	0.74	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
20-12-00738-009	103-W-09	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	3.40	3.4	L01
		Cadmium (Cd)	1.00	0.345	0.34	L01
		Chromium (Cr)	1.00	<1.00	<1.0	L01
		Lead (Pb)	1.00	1.68	1.7	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
20-12-00738-010	103-W-10	Arsenic (As)	1.14	2.28	2.0	L02
		Barium (Ba)	1.14	96.7	85	L02

# Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 20-12-00738

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; 103-W-01-103-W-22

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft <sup>2</sup> )	Total Metal (ug)	Concentration (ug/ft <sup>2</sup> )	Narrative ID
		Cadmium (Cd)	1.14	0.515	0.45	L02
		Chromium (Cr)	1.14	2.22	2.0	L02
		Lead (Pb)	1.14	2.82	2.5	L02
		Selenium (Se)	1.14	<2.50	<2.2	L02
		Silver (Ag)	1.14	<0.500	<0.44	L02
20-12-00738-011	103-W-11	Arsenic (As)	1.50	<1.00	<0.67	L01
		Barium (Ba)	1.50	14.2	9.5	L01
		Cadmium (Cd)	1.50	0.540	0.36	L01
		Chromium (Cr)	1.50	3.67	2.4	L01
		Lead (Pb)	1.50	12.3	8.2	L01
		Selenium (Se)	1.50	<2.50	<1.7	L01
		Silver (Ag)	1.50	<0.500	<0.33	L01
20-12-00738-012	103-W-12	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	8.82	8.8	L01
		Cadmium (Cd)	1.00	0.345	0.34	L01
		Chromium (Cr)	1.00	3.14	3.1	L01
		Lead (Pb)	1.00	19.3	19	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01

# Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 20-12-00738

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; 103-W-01-103-W-22

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft <sup>2</sup> )	Total Metal (ug)	Concentration (ug/ft <sup>2</sup> )	Narrative ID
		Silver (Ag)	1.00	<0.500	<0.50	L01
20-12-00738-013	103-W-13	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	22.9	23	L01
		Cadmium (Cd)	1.00	0.930	0.93	L01
		Chromium (Cr)	1.00	3.52	3.5	L01
		Lead (Pb)	1.00	77.2	77	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	0.515	0.52	L01
20-12-00738-014	103-W-14	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	4.34	4.3	L01
		Cadmium (Cd)	1.00	<0.100	<0.10	L01
		Chromium (Cr)	1.00	1.53	1.5	L01
		Lead (Pb)	1.00	2.70	2.7	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
20-12-00738-015	103-W-15	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	1.00	1.0	L01
		Cadmium (Cd)	1.00	<0.100	<0.10	L01

# Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 20-12-00738

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; 103-W-01-103-W-22

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft <sup>2</sup> )	Total Metal (ug)	Concentration (ug/ft <sup>2</sup> )	Narrative ID
		Chromium (Cr)	1.00	<1.00	<1.0	L01
		Lead (Pb)	1.00	0.705	0.70	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
20-12-00738-016	103-W-16	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	1.43	1.4	L01
		Cadmium (Cd)	1.00	<0.100	<0.10	L01
		Chromium (Cr)	1.00	<1.00	<1.0	L01
		Lead (Pb)	1.00	<0.500	<0.50	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
20-12-00738-017	103-W-17	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	0.850	0.85	L01
		Cadmium (Cd)	1.00	<0.100	<0.10	L01
		Chromium (Cr)	1.00	<1.00	<1.0	L01
		Lead (Pb)	1.00	<0.500	<0.50	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01

# Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 20-12-00738

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; 103-W-01-103-W-22

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft <sup>2</sup> )	Total Metal (ug)	Concentration (ug/ft <sup>2</sup> )	Narrative ID
20-12-00738-018	103-W-18	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	8.18	8.2	L01
		Cadmium (Cd)	1.00	0.235	0.24	L01
		Chromium (Cr)	1.00	2.34	2.3	L01
		Lead (Pb)	1.00	7.39	7.4	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
20-12-00738-019	103-W-19	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	24.1	24	L01
		Cadmium (Cd)	1.00	0.870	0.87	L01
		Chromium (Cr)	1.00	4.82	4.8	L01
		Lead (Pb)	1.00	40.8	41	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
20-12-00738-020	103-W-20	Arsenic (As)	1.00	4.80	4.8	L02
		Barium (Ba)	1.00	130	130	L02
		Cadmium (Cd)	1.00	3.44	3.4	L02
		Chromium (Cr)	1.00	33.1	33	L02

# Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 20-12-00738

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; 103-W-01-103-W-22

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft <sup>2</sup> )	Total Metal (ug)	Concentration (ug/ft <sup>2</sup> )	Narrative ID
		Lead (Pb)	1.00	261	260	L02
		Selenium (Se)	1.00	<2.50	<2.5	L02
		Silver (Ag)	1.00	0.775	0.78	L02
20-12-00738-021	103-W-21	Arsenic (As)		<1.00	---	L01
		Barium (Ba)		<0.500	---	L01
		Cadmium (Cd)		<0.100	---	L01
		Chromium (Cr)		<1.00	---	L01
		Lead (Pb)		<0.500	---	L01
		Selenium (Se)		<2.50	---	L01
		Silver (Ag)		<0.500	---	L01
20-12-00738-022	103-W-22	Arsenic (As)		<1.00	---	L01
		Barium (Ba)		<0.500	---	L01
		Cadmium (Cd)		<0.100	---	L01
		Chromium (Cr)		<1.00	---	L01
		Lead (Pb)		<0.500	---	L01
		Selenium (Se)		<2.50	---	L01
		Silver (Ag)		<0.500	---	L01

# Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 20-12-00738

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; 103-W-01-103-W-22

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft <sup>2</sup> )	Total Metal (ug)	Concentration (ug/ft <sup>2</sup> )	Narrative ID
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Sample Narratives:

- L01: LCS/LCS D percent recoveries for Se were outside of acceptable control limits.
- L02: Sample was highly reactive to reagents. Some sample loss occurred. Results may be underestimated. LCS/LCS D percent recoveries for Se were outside of acceptable control limits.

Analyst: Brittany Meyer

Method: Mercury (Hg): EPA SW846 7471B

All other metals: EPA SW846 3050B/6010D



Reviewed By Authorized Signatory:

Tasha Eaddy  
QA/QC Clerk

Sample Results denoted with a "less than" (<) sign contains less than the reporting limit for each particular metal, based on a 50mL volume. The reporting limit for Cadmium is 0.10ug, Barium, Lead and Silver are 0.50ug, Arsenic and Chromium are 1.0ug, and Selenium is 2.5ug.

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the client. Unless otherwise noted, samples are reported without a dry weight correction. Sample location, description, area, volume, etc., was provided by the client. If the report does not contain the result for a field blank, it is due to the fact that the client did not include a field blank with their samples. EHS sample results do not reflect blank correction. This report shall not be reproduced except in full, without the written consent of the Environmental Hazards Service, L.L.C. California Certification #2319 NY ELAP #11714.

Legend	ug = microgram	ug/ft <sup>2</sup> = micrograms per square foot
	mL = milliliter	ft <sup>2</sup> = square foot



# ENVIRONMENTAL HAZARDS SERVICES, LLC

## Metals Chain of Custody Form

Company Name	Burns & McDonnell	Account #	26-3514
Company Address	9400 Ward Parkway	City/State/Zip	Kansas City, MO 64114
Phone	314-302-4661	Email	eaahlemeyer@burnsmcd.com
Project Name / Testing Address	GFC / 4300 Goodfellow Blvd		
PO Number	168765	Collected By	Emily Ahlemeyer & Jeff Smith
Turn-Around Time	<input checked="" type="radio"/> 3 DAY <input type="radio"/> 2 DAY <input type="radio"/> 1 DAY <input type="radio"/> SAME DAY OR WEEKEND - Must Call Ahead		

LAB NUMBER	Client Sample ID	Collection Date & Time	METALS						Other Metals	PARTICULATES					AIR			WIPES AREA <small>Circle The Unit of Measurement Used</small> cm or <u>in</u>
			Pb TCLP	TCLP RCRA 8	RCRA 8 Total	Toxic Metal Profile	Welding Fume Profile	TX 11 TCLP		CA 17 Total	Total Nuisance Dust	Respirable Dust	TSP Gravimetric	TSP Pb	PM-10	Total Time	Flow Rate	
1	103-W-01	12/3/2020 1255							Aq, As, Ba, Cd, Cr, Pb, Se									12 x 12
2	103-W-02	1300																12 x 12
3	103-W-03	1305																12 x 12
4	103-W-04	1308																12 x 12
5	103-W-05	1311																12 x 12
6	103-W-06	1317																18 x 10.5
7	103-W-07	1321																12 x 12
8	103-W-08	1325																12 x 12
9	103-W-09	1347																12 x 12
10	103-W-10	1354																14.25 x 8.5
11	103-W-11	1401																24 x 9
12	103-W-12	1406																12 x 12
13	103-W-13	1415																12 x 12
14	103-W-14	1418																12 x 12
15	103-W-15	1422																12 x 12

Released By: Emily Ahlemeyer	Date: 12/4/2020	Time: 1600
Signature: (b) (6)		


LAB USE ONLY - BELOW THIS LINE

Received By: Stone  
 Signature: (b) (6)  
 Date: 12/7/20 Time: 11:57  AM  PM

Portal Contact Added

7469 WHITEPINE RD, RICHMOND, VA 23237 (800)-347-4010  
 RESULTS VIA CLIENT PORTAL AVAILABLE @ www.leadlab.com

20-12-00738



Due Date:  
12/10/2020  
(Thursday)  
EL

# ENVIRONMENTAL HAZARDS SERVICES, LLC

## Metals Chain of Custody Form

Company Name	Burns & McDonnell	Account #	26-3514
Company Address	9400 Ward Parkway	City/State/Zip	Kansas City, MO 64114
Phone	314-302-4661	Email	eaahlemeyer@burnsmcd.com
Project Name / Testing Address	GFC/4300 Goodfellow Blvd		
PO Number	168765	Collected By	Emily Ahlemeyer & Jeff Smith
Turn-Around Time	<input checked="" type="radio"/> 3 DAY <input type="radio"/> 2 DAY <input type="radio"/> 1 DAY <input type="radio"/> SAME DAY OR WEEKEND - Must Call Ahead		

LAB NUMBER	Client Sample ID	Collection Date & Time	METALS						Other Metals	PARTICULATES					AIR			WIPES AREA <small>Circle The Unit of Measurement Used cm or (in)</small>	
			Pb TCLP	TCLP RCRA 8	RCRA 8 Total	Toxic Metal Profile	Welding Fume Profile	TX 11 TCLP		CA 17 Total	Total Nuisance Dust	Respirable Dust	TSP Gravimetric	TSP Pb	PM-10	Total Time	Flow Rate		Vol.
																Mins.	L/min.		Total Liters
1	103-W-16	12/3/2020 1426							Aq, As, Ba, Cd, Cr, Pb, Se										12 x 12
2	103-W-17																		12 x 12
3	103-W-18																		12 x 12
4	103-W-19																		12 x 12
5	103-W-20																		12 x 12
6	103-W-21																		NA x NA
7	103-W-22																		NA x NA
8																	X		
9																	X		
10																	X		
11																	X		
12																	X		
13																	X		
14																	X		
15																	X		

Released By:	Emily Ahlemeyer	Date:	12/4/2020	Time:	1600
Signature:	(b) (6)				

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Received By: TS+One

Signature: (b) (6)

Date: 12/7/20 Time: 11:57  AM  PM

Portal Contact Added

7469 WHITEPINE RD, RICHMOND, VA 23237 (800)-347-4010

RESULTS VIA CLIENT PORTAL AVAILABLE @ [www.leadlab.com](http://www.leadlab.com)

738

**EHS** Laboratories™

Attach Laboratory Label Here



Environmental Hazards Services, L.L.C.  
 7469 Whitepine Rd  
 Richmond, VA 23237  
 Telephone: 800.347.4010

## Wipe Metals Analysis Report

**Client:** Burns & McDonnell Engineering  
 9400 Ward Pkwy.  
 Kansas City, MO 64114

**Report Number:** 20-12-01725

**Received Date:** 12/14/2020

**Analyzed Date:** 12/17/2020

**Reported Date:** 12/17/2020

**Project/Test Address:** 168765; GFC; 4300 Goodfellow Blvd; 103W-23-24

**Client Number:**  
 26-3514

# Laboratory Results

**Fax Number:**  
 816-822-3494

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft <sup>2</sup> )	Total Metal (ug)	Concentration (ug/ft <sup>2</sup> )	Narrative ID
20-12-01725-001	103-W-23	Arsenic (As)	1.00	<1.00	<1.0	L02
		Barium (Ba)	1.00	0.685	0.68	L02
		Cadmium (Cd)	1.00	<0.100	<0.10	L02
		Chromium (Cr)	1.00	<1.00	<1.0	L02
		Lead (Pb)	1.00	<0.500	<0.50	L02
		Selenium (Se)	1.00	<2.50	<2.5	L02
		Silver (Ag)	1.00	<0.500	<0.50	L02
20-12-01725-002	103-W-24	Arsenic (As)	1.00	<1.00	<1.0	L02
		Barium (Ba)	1.00	2.48	2.5	L02
		Cadmium (Cd)	1.00	<0.100	<0.10	L02
		Chromium (Cr)	1.00	<1.00	<1.0	L02

# Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 20-12-01725

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd; 103W-23-24

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft <sup>2</sup> )	Total Metal (ug)	Concentration (ug/ft <sup>2</sup> )	Narrative ID
		Lead (Pb)	1.00	1.26	1.3	L02
		Selenium (Se)	1.00	<2.50	<2.5	L02
		Silver (Ag)	1.00	<0.500	<0.50	L02

## Sample Narratives:

L02: LCS/LCS D analysis for Se exceeded acceptance limits.

**Analyst:** Brittany Meyer

**Method:** Mercury (Hg): EPA SW846 7471B

All other metals: EPA SW846 3050B/6010D

Reviewed By Authorized Signatory:

(b) (6)

Missy Kanode

QA/QC Clerk

Sample Results denoted with a "less than" (<) sign contains less than the reporting limit for each particular metal, based on a 50mL volume. The reporting limit for Cadmium is 0.10ug, Barium, Lead and Silver are 0.50ug, Arsenic and Chromium are 1.0ug, and Selenium is 2.5ug.

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the client. Unless otherwise noted, samples are reported without a dry weight correction. Sample location, description, area, volume, etc., was provided by the client. If the report does not contain the result for a field blank, it is due to the fact that the client did not include a field blank with their samples. EHS sample results do not reflect blank correction. This report shall not be reproduced except in full, without the written consent of the Environmental Hazards Service, L.L.C. California Certification #2319 NY ELAP #11714.

Legend                    ug = microgram                    ug/ft<sup>2</sup> = micrograms per square foot  
                                 mL = milliliter                    ft<sup>2</sup> = square foot

# ENVIRONMENTAL HAZARDS SERVICES, LLC

## Metals Chain of Custody Form

Pg 1 of 1

Company Name	Burns & McDonnell	Account #	26-3514
Company Address	9400 Ward Parkway	City/State/Zip	Kansas City, MO 64114
Phone	314-302-4661	Email	eaahlemeyer@burnsmcd.com
Project Name / Testing Address	GFC/4300 Goodfellow Blvd		
PO Number	168765	Collected By	Emily Ahlemeyer & Eric Wenger
Turn-Around Time	<input checked="" type="checkbox"/> 3 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 1 DAY <input type="checkbox"/> SAME DAY OR WEEKEND - Must Call Ahead		

LAB NUMBER	Client Sample ID	Collection Date & Time	METALS							Other Metals	PARTICULATES				AIR			WIPES AREA Circle The Unit of Measurement Used cm or <u>in</u>	
			Pb TCLP	TCLP RCRA 8	RCRA 8 Total	Toxic Metal Profile	Welding Fume Profile	TX 11 TCLP	CA 17 Total		Total Nuisance Dust	Respirable Dust	TSP Gravimetric	TSP Pb	PM-10	Total Time	Flow Rate		Vol.
																Mins.	L/min.		Total Liters
1	103-W-23	12/10/2020 0947							Ag, As, Ba, Cd, Cr, Pb, Se										12 x 12
2	103-W-24	12/10/2020 0950							1										12 x 12
3																		X	
4																		X	
5																		X	
6																		X	
7																		X	
8																		X	
9																		X	
10																		X	
11																		X	
12																		X	
13																		X	
14																		X	
15																		X	

Released By: Emily Ahlemeyer	Date: 12/11/2020	Time: 1600
Signature: (b) (6)		

LAB USE ONLY – BELOW THIS LINE

Received By: TSTONE

Signature: (b) (6)

Date: 12/14/20 Time: 11:16  AM  PM

Portal Contact Added

7469 WHITEPINE RD, RICHMOND, VA 23237 (800)-347-4010

RESULTS VIA CLIENT PORTAL AVAILABLE @ [www.leadlab.com](http://www.leadlab.com)

20-12-01725

Due Date:  
12/17/2020  
(Thursday)  
EL

## **APPENDIX C – LICENSES**



**STATE OF MISSOURI  
DEPARTMENT OF HEALTH AND SENIOR SERVICES**

**LEAD OCCUPATION LICENSE REGISTRATION**

Issued to:

**Jeffrey T. Smith**

The person, firm or corporation whose name appears on this certificate has fulfilled the requirements for licensure as set forth in the Missouri Revised Statutes 701.300-701.338, as long as not suspended or revoked, and is hereby authorized to engage in the activity listed below.

**Lead Risk Assessor**  
Category of License

Issuance Date: **3/16/2019**  
Expiration Date: **3/16/2021**  
License Number: **010316-200089640**



(b) (6)

Randall W. Williams, MD, FACOG  
Director  
Department of Health and Senior Services

Lead Licensing Program, PO Box 570, Jefferson City, MO 65102