



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 107
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 107 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. 107 was conducted on December 11, 2020 by Emily Ahlemeyer of Burns & McDonnell and Eric Wenger of Burns & McDonnell.

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 9 of the 9 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 ^(a) (µg/sq. ft) ^(b)	Highest Concentration ^(a) (µg/sq. ft) ^(b)	Clean Area Limit ^(c) µg/sq. ft ^(b)
Silver	<0.5	63.0	62
Arsenic	<1.0	2.4	62
Barium	1.0	140.0	3,094
Cadmium	<0.1	2.5	31
Chromium (Total)	<1.0	16.0	3,094
Lead	1.0	94.0	10 ^(d)
Selenium	<2.5	<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/m³) x 10 m³/100cm²] / 15.
- (d) Lead clean area limit: Brookhaven references EPA/HUD limit for floors, set at 10 µg/sq. ft. as of January 2020.

Two (2) samples exceeded the lead clean area limit. Samples 107-W-07 and 107-W-08 resulted in lead concentrations of 39 and 94 µg/sq. ft, respectively. One sample exceeded the silver clean area limit. Sample 107-W-07 resulted in a silver concentration of 63 µg/sq. ft. 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.

APPENDIX A – SAMPLE SUMMARY TABLE

Appendix A

Sample Summary Table

Sample Number	Location	Area Description	Analyte	Result	Units	Clean Area Limit*
107-W-01	1st floor, OCCU-TEC/BMCD office	Center table	Silver	< 0.50	µg/ft ²	62
			Arsenic	< 1.0	µg/ft ²	62
			Barium	1.0	µg/ft ²	3,094
			Cadmium	< 0.10	µg/ft ²	31
			Chromium	< 1.0	µg/ft ²	3,094
			Lead	1.6	µg/ft ²	10
			Selenium	< 2.5	µg/ft ²	1,236
107-W-02	1st floor, room 100	Top of box	Silver	< 0.50	µg/ft ²	62
			Arsenic	< 1.0	µg/ft ²	62
			Barium	3.2	µg/ft ²	3,094
			Cadmium	< 0.10	µg/ft ²	31
			Chromium	1.0	µg/ft ²	3,094
			Lead	1.3	µg/ft ²	10
			Selenium	< 2.5	µg/ft ²	1,236
107-W-03	1st floor, outside door to basement	Floor	Silver	< 0.50	µg/ft ²	62
			Arsenic	< 1.0	µg/ft ²	62
			Barium	1.4	µg/ft ²	3,094
			Cadmium	< 0.10	µg/ft ²	31
			Chromium	1.2	µg/ft ²	3,094
			Lead	1.9	µg/ft ²	10
			Selenium	< 2.5	µg/ft ²	1,236

Appendix A
Sample Summary Table

Sample Number	Location	Area Description	Analyte	Result	Units	Clean Area Limit*
107-W-04	1st floor, GSA break room	Top of light fixture	Silver	< 0.50	µg/ft ²	62
			Arsenic	< 1.0	µg/ft ²	62
			Barium	24	µg/ft ²	3,094
			Cadmium	0.29	µg/ft ²	31
			Chromium	6.0	µg/ft ²	3,094
			Lead	6.3	µg/ft ²	10
			Selenium	< 2.5	µg/ft ²	1,236
107-W-05	1st floor, room 134	Floor outside conference room	Silver	< 0.50	µg/ft ²	62
			Arsenic	< 1.0	µg/ft ²	62
			Barium	1.9	µg/ft ²	3,094
			Cadmium	< 0.10	µg/ft ²	31
			Chromium	1.2	µg/ft ²	3,094
			Lead	1.1	µg/ft ²	10
			Selenium	< 2.5	µg/ft ²	1,236
107-W-06	2nd floor, room 246	Floor	Silver	< 0.50	µg/ft ²	62
			Arsenic	< 1.0	µg/ft ²	62
			Barium	3.2	µg/ft ²	3,094
			Cadmium	< 0.10	µg/ft ²	31
			Chromium	1.4	µg/ft ²	3,094
			Lead	1.0	µg/ft ²	10
			Selenium	< 2.5	µg/ft ²	1,236

Appendix A

Sample Summary Table

Sample Number	Location	Area Description	Analyte	Result	Units	Clean Area Limit*
107-W-07	2nd floor, north stairwell	Mid-landing floor	Silver	63 **	µg/ft ²	62
			Arsenic	< 1.0	µg/ft ²	62
			Barium	140	µg/ft ²	3,094
			Cadmium	0.77	µg/ft ²	31
			Chromium	6.1	µg/ft ²	3,094
			Lead	39 **	µg/ft ²	10
			Selenium	< 2.5	µg/ft ²	1,236
107-W-08	Basement	Floor near decoration storage	Silver	1.1	µg/ft ²	62
			Arsenic	2.4	µg/ft ²	62
			Barium	67	µg/ft ²	3,094
			Cadmium	2.5	µg/ft ²	31
			Chromium	16	µg/ft ²	3,094
			Lead	94 **	µg/ft ²	10
			Selenium	< 2.5	µg/ft ²	1,236
107-W-09	Field Blank	--	Silver	< 0.500	µg	--
			Arsenic	< 1.00	µg	--
			Barium	< 0.500	µg	--
			Cadmium	< 0.100	µg	--
			Chromium	< 1.00	µg	--
			Lead	0.785	µg	--
			Selenium	< 2.50	µg	--

* Clean Area Limit per Brookhaven IH75190=OSHA Housekeeping Limit [$\mu\text{g}/\text{m}^3 \times 10 \text{ m}^3/100\text{cm}^2$] / 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

*** Lead was detected in the field blank at 0.785 µg. This low detection does not significantly change any of the lead results compared to the lead Clean Area Limit; therefore, no blank correction is necessary.

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: 20-12-01714

Received Date: 12/14/2020

Analyzed Date: 12/17/2020

Reported Date: 12/17/2020

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd; 107-W-01-9

Client Number:
 26-3514

Laboratory Results

Fax Number:
 816-822-3494

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft ²)	Total Metal (ug)	Concentration (ug/ft ²)	Narrative ID
20-12-01714-001	107-W-01	Arsenic (As)	1.00	<1.00	<1.0	L02
		Barium (Ba)	1.00	1.00	1.0	L02
		Cadmium (Cd)	1.00	<0.100	<0.10	L02
		Chromium (Cr)	1.00	<1.00	<1.0	L02
		Lead (Pb)	1.00	1.56	1.6	L02
		Selenium (Se)	1.00	<2.50	<2.5	L02
		Silver (Ag)	1.00	<0.500	<0.50	L02
20-12-01714-002	107-W-02	Arsenic (As)	1.00	<1.00	<1.0	L02
		Barium (Ba)	1.00	3.18	3.2	L02
		Cadmium (Cd)	1.00	<0.100	<0.10	L02
		Chromium (Cr)	1.00	1.02	1.0	L02

Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 20-12-01714

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd; 107-W-01-9

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft ²)	Total Metal (ug)	Concentration (ug/ft ²)	Narrative ID
		Lead (Pb)	1.00	1.34	1.3	L02
		Selenium (Se)	1.00	<2.50	<2.5	L02
		Silver (Ag)	1.00	<0.500	<0.50	L02
20-12-01714-003	107-W-03	Arsenic (As)	1.00	<1.00	<1.0	L02
		Barium (Ba)	1.00	1.36	1.4	L02
		Cadmium (Cd)	1.00	<0.100	<0.10	L02
		Chromium (Cr)	1.00	1.20	1.2	L02
		Lead (Pb)	1.00	1.87	1.9	L02
		Selenium (Se)	1.00	<2.50	<2.5	L02
		Silver (Ag)	1.00	<0.500	<0.50	L02
20-12-01714-004	107-W-04	Arsenic (As)	1.00	<1.00	<1.0	L02
		Barium (Ba)	1.00	24.1	24	L02
		Cadmium (Cd)	1.00	0.290	0.29	L02
		Chromium (Cr)	1.00	6.03	6.0	L02
		Lead (Pb)	1.00	6.30	6.3	L02
		Selenium (Se)	1.00	<2.50	<2.5	L02
		Silver (Ag)	1.00	<0.500	<0.50	L02
20-12-01714-005	107-W-05	Arsenic (As)	1.00	<1.00	<1.0	L02
		Barium (Ba)	1.00	1.92	1.9	L02

Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 20-12-01714

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd; 107-W-01-9

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft ²)	Total Metal (ug)	Concentration (ug/ft ²)	Narrative ID
		Cadmium (Cd)	1.00	<0.100	<0.10	L02
		Chromium (Cr)	1.00	1.18	1.2	L02
		Lead (Pb)	1.00	1.14	1.1	L02
		Selenium (Se)	1.00	<2.50	<2.5	L02
		Silver (Ag)	1.00	<0.500	<0.50	L02
20-12-01714-006	107-W-06	Arsenic (As)	1.00	<1.00	<1.0	L02
		Barium (Ba)	1.00	3.24	3.2	L02
		Cadmium (Cd)	1.00	<0.100	<0.10	L02
		Chromium (Cr)	1.00	1.39	1.4	L02
		Lead (Pb)	1.00	1.03	1.0	L02
		Selenium (Se)	1.00	<2.50	<2.5	L02
		Silver (Ag)	1.00	<0.500	<0.50	L02
20-12-01714-007	107-W-07	Arsenic (As)	1.00	<1.00	<1.0	L02
		Barium (Ba)	1.00	140	140	L02
		Cadmium (Cd)	1.00	0.770	0.77	L02
		Chromium (Cr)	1.00	6.11	6.1	L02
		Lead (Pb)	1.00	39.5	39	L02
		Selenium (Se)	1.00	<2.50	<2.5	L02
		Silver (Ag)	1.00	63.4	63	L02

Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 20-12-01714

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd; 107-W-01-9

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft ²)	Total Metal (ug)	Concentration (ug/ft ²)	Narrative ID
20-12-01714-008	107-W-08	Arsenic (As)	1.00	2.42	2.4	L02
		Barium (Ba)	1.00	66.6	67	L02
		Cadmium (Cd)	1.00	2.54	2.5	L02
		Chromium (Cr)	1.00	15.5	16	L02
		Lead (Pb)	1.00	94.4	94	L02
		Selenium (Se)	1.00	<2.50	<2.5	L02
		Silver (Ag)	1.00	1.12	1.1	L02
20-12-01714-009	107-W-09	Arsenic (As)		<1.00	---	L02
		Barium (Ba)		<0.500	---	L02
		Cadmium (Cd)		<0.100	---	L02
		Chromium (Cr)		<1.00	---	L02
		Lead (Pb)		0.785	---	L02
		Selenium (Se)		<2.50	---	L02
		Silver (Ag)		<0.500	---	L02

Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 20-12-01714

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd; 107-W-01-9

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

(b) (6)

Reviewed By Authorized Signatory:

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 ² = micrograms per square foot
	mL = milliliter	ft ² = 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 (in)	
			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	107-W-01	12/11/2020 1020							Ag, As, Ba, Cd, Cr, Pb, Se										12 x 12
2	107-W-02	1025																12 x 12	
3	107-W-03	1029																12 x 12	
4	107-W-04	1037																12 x 12	
5	107-W-05	1040																12 x 12	
6	107-W-06	1050																12 x 12	
7	107-W-07	1056																12 x 12	
8	107-W-08	1142																12 x 12	
9	107-W-09	0827																NA x NA	
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: Stone

Signature: (b) (6)

Date: 12/14/20 Time: 11:08 AM PM

Portal Contact Added

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

RESULTS VIA CLIENT PORTAL AVAILABLE @ www.leadlab.com

20-12-01714

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

APPENDIX C – LICENSES



**Missouri Department of Health
and Senior Services**

(b) (6)

Lead Occupation License - ID Badge
License Number: 080311-300001861

Lead Risk Assessor

**Eric
Wenger**

Expiration Date: **03/11/2022**

STATE OF MISSOURI
DEPARTMENT OF HEALTH AND SENIOR SERVICES

LEAD OCCUPATION LICENSE REGISTRATION

Issued to:

Eric N. Wenger

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: **3/11/2020**
Expiration Date: **3/11/2022**
License Number: **080311-300001861**



(b) (6)

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

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