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 102E
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 102E 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. 102E was conducted on November 30, 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

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 8 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.

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	2.5	62
Arsenic	<1.0	1.7	62
Barium	1.1	81.0	3,094
Cadmium	<0.1	3.6	31
Chromium (Total)	<1.0	54.0	3,094
Lead	0.9	100.0	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/m^3) x 10 m^3/100cm^2] / 15.
(d) Lead clean area limit: Brookhaven references EPA/HUD limit for floors, set at 10 µg/sq. ft. as of January 2020.

Three (3) samples exceeded the lead clean area limit. Samples 102E-W-02, 102E-W-03, and 102E-W-08 resulted in lead concentrations of 53, 70, and 100 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

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*
102E-W-01	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	--
102E-W-02	1st floor, south mechanical room	Floor in northwest corner	Silver	2.5	µg/ft^2	62
			Arsenic	1.7	µg/ft^2	62
			Barium	81	µg/ft^2	3,094
			Cadmium	2.2	µg/ft^2	31
			Chromium	54	µg/ft^2	3,094
			Lead	53 **	µg/ft^2	10
			Selenium	< 2.5	µg/ft^2	1,236
102E-W-03	Roof level, south stairwell	Stair tread	Silver	< 0.50	µg/ft^2	62
			Arsenic	< 1.0	µg/ft^2	62
			Barium	68	µg/ft^2	3,094
			Cadmium	0.78	µg/ft^2	31
			Chromium	6.3	µg/ft^2	3,094
			Lead	70 **	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*
102E-W-04	1st floor, GSA fleet manager office	Windowsill	Silver	< 0.50	µg/ft^2	62
			Arsenic	< 1.0	µg/ft^2	62
			Barium	2.2	µg/ft^2	3,094
			Cadmium	0.24	µg/ft^2	31
			Chromium	< 1.0	µg/ft^2	3,094
			Lead	1.8	µg/ft^2	10
			Selenium	< 2.5	µg/ft^2	1,236
102E-W-05	1st floor, north lobby	Top of vending machine	Silver	< 0.50	µg/ft^2	62
			Arsenic	< 1.0	µg/ft^2	62
			Barium	2.7	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
102E-W-06	1st floor, north IT closet	Floor	Silver	< 0.50	µg/ft^2	62
			Arsenic	< 1.0	µg/ft^2	62
			Barium	3.4	µg/ft^2	3,094
			Cadmium	< 0.10	µg/ft^2	31
			Chromium	< 1.0	µg/ft^2	3,094
			Lead	1.7	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*
102E-W-07	1st floor, south storage room	Bottom shelf on north wall	Silver	< 0.50	µg/ft^2	62
			Arsenic	< 1.0	µg/ft^2	62
			Barium	2.9	µg/ft^2	3,094
			Cadmium	< 0.10	µg/ft^2	31
			Chromium	< 1.0	µg/ft^2	3,094
			Lead	1.4	µg/ft^2	10
			Selenium	< 2.5	µg/ft^2	1,236
102E-W-08	2nd floor, elevator mechanical	Floor in northeast corner	Silver	1.8	µg/ft^2	62
			Arsenic	1.6	µg/ft^2	62
			Barium	30	µg/ft^2	3,094
			Cadmium	3.6	µg/ft^2	31
			Chromium	18	µg/ft^2	3,094
			Lead	100 **	µg/ft^2	10
			Selenium	< 2.5	µg/ft^2	1,236
102E-W-09	2nd floor, south break area	Floor in tiled area	Silver	< 0.50	µg/ft^2	62
			Arsenic	< 1.0	µg/ft^2	62
			Barium	1.1	µg/ft^2	3,094
			Cadmium	< 0.10	µg/ft^2	31
			Chromium	< 1.0	µg/ft^2	3,094
			Lead	0.90	µg/ft^2	10
			Selenium	< 2.5	µg/ft^2	1,236

* Clean Area Limit per Brookhaven IH75190=OSHA Housekeeping Limit [PEL (µg/m^3) x 10 m^3/100cm^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: 20-12-00735

Received Date: 12/07/2020
Analyzed Date: 12/08/2020
Reported Date: 12/10/2020

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; 102E-W-01-102E-W-09

Client Number:
26-3514

Laboratory Results

Fax Number:
816-822-3494

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft²)	Total Metal (ug)	Concentration (ug/ft²)	Narrative ID
20-12-00735-001	102E-W-01	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
20-12-00735-002	102E-W-02	Arsenic (As)	1.00	1.74	1.7	L01
		Barium (Ba)	1.00	81.2	81	L01
		Cadmium (Cd)	1.00	2.20	2.2	L01
		Chromium (Cr)	1.00	54.4	54	L01

Environmental Hazards Services, L.L.C

Client Number: 26-3514 **Report Number:** 20-12-00735

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; 102E-W-01-102E-W-09

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft²)	Total Metal (ug)	Concentration (ug/ft²)	Narrative ID
		Lead (Pb)	1.00	53.4	53	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	2.46	2.5	L01
20-12-00735-003	102E-W-03	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	67.6	68	L01
		Cadmium (Cd)	1.00	0.775	0.78	L01
		Chromium (Cr)	1.00	6.34	6.3	L01
		Lead (Pb)	1.00	70.5	70	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
20-12-00735-004	102E-W-04	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	2.23	2.2	L01
		Cadmium (Cd)	1.00	0.235	0.24	L01
		Chromium (Cr)	1.00	<1.00	<1.0	L01
		Lead (Pb)	1.00	1.82	1.8	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
20-12-00735-005	102E-W-05	Arsenic (As)	1.00	<1.00	<1.0	L01

Environmental Hazards Services, L.L.C

Client Number: 26-3514 **Report Number:** 20-12-00735

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; 102E-W-01-102E-W-09

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft²)	Total Metal (ug)	Concentration (ug/ft²)	Narrative ID
		Barium (Ba)	1.00	2.72	2.7	L01
		Cadmium (Cd)	1.00	<0.100	<0.10	L01
		Chromium (Cr)	1.00	<1.00	<1.0	L01
		Lead (Pb)	1.00	1.31	1.3	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
20-12-00735-006	102E-W-06	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	3.40	3.4	L01
		Cadmium (Cd)	1.00	<0.100	<0.10	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
20-12-00735-007	102E-W-07	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	2.87	2.9	L01
		Cadmium (Cd)	1.00	<0.100	<0.10	L01
		Chromium (Cr)	1.00	<1.00	<1.0	L01
		Lead (Pb)	1.00	1.40	1.4	L01

Environmental Hazards Services, L.L.C

Client Number: 26-3514 **Report Number:** 20-12-00735

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; 102E-W-01-102E-W-09

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft²)	Total Metal (ug)	Concentration (ug/ft²)	Narrative ID
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	<0.500	<0.50	L01
20-12-00735-008	102E-W-08	Arsenic (As)	1.00	1.63	1.6	L01
		Barium (Ba)	1.00	29.7	30	L01
		Cadmium (Cd)	1.00	3.65	3.6	L01
		Chromium (Cr)	1.00	18.3	18	L01
		Lead (Pb)	1.00	102	100	L01
		Selenium (Se)	1.00	<2.50	<2.5	L01
		Silver (Ag)	1.00	1.78	1.8	L01
20-12-00735-009	102E-W-09	Arsenic (As)	1.00	<1.00	<1.0	L01
		Barium (Ba)	1.00	1.14	1.1	L01
		Cadmium (Cd)	1.00	<0.100	<0.10	L01
		Chromium (Cr)	1.00	<1.00	<1.0	L01
		Lead (Pb)	1.00	0.900	0.90	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:** 20-12-00735

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd.; 102E-W-01-102E-W-09

Lab Sample Number	Client Sample Number	Analyte:	Wipe Area (ft²)	Total Metal (ug)	Concentration (ug/ft²)	Narrative ID

Sample Narratives:

L01: 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

(b) (6) [redacted]

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/ft² = micrograms per square foot
	mL = milliliter	ft² = 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	1687765	Collected By	Emily Ahlemeyer & Jeff Smith
Turn-Around Time	X 3 DAY ○ 2 DAY ○ 1 DAY ○ SAME DAY OR WEEKEND - Must Call Ahead		

LAB NUMBER	Client Sample ID	Collection Date & Time	METALS: Pb TCLP	TCLP RCRA 8	RCRA 8 Total	Toxic Metal Profile	Welding Fume Profile	TX 11 TCLP	CA 17 Total	Other Metals	PARTICULATES: Total Nuisance Dust	Respirable Dust	TSP Gravimetric	TSP Pb	PM-10	AIR: Total Time (Mins.)	Flow Rate (L/min.)	Vol. (Total Liters)	WIPES: AREA (Circle The Unit of Measurement Used: cm or in)
1	102E-W-01	11/30/2020 0938								Ag, As, Ba, Cd, Cr, Pb, Se									NA x NA
2	102E-W-02	1138																	12 x 12
3	102E-W-03	1143																	12 x 12
4	102E-W-04	1148																	12 x 12
5	102E-W-05	1154																	12 x 12
6	102E-W-06	1200																	12 x 12
7	102E-W-07	1204																	12 x 12
8	102E-W-08	1208																	12 x 12
9	102E-W-09	1212																	12 x 12
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) [redacted]				

LAB USE ONLY – BELOW THIS LINE

Received By: TStone

Signature: (b) (6) [redacted]

Date: 12/7/20 Time: 11:53 ☑ AM ☐ PM

☐ Portal Contact Added

20-12-00735

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

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

RESULTS VIA CLIENT PORTAL AVAILABLE @ www.leadlab.com

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) [redacted]

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

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