



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 – Bldg. 104E Air Sampling  
Project No. 121244

Dear Ms. Czarnecki:

Thank you for the opportunity to provide the General Services Administration (GSA) with the Resource Conservation and Recovery Act (RCRA) metals air sampling investigation of the above referenced building located at the Goodfellow Federal Complex, in St. Louis, Missouri. Burns & McDonnell understands that the purpose of the investigation was to provide sampling data regarding existing conditions to supplement previous investigation reports prepared for the facility. The following report summarizes air-sample collection activities and the laboratory analytical results of the samples submitted.

#### **METHODOLOGY**

On December 4, 2020, Emily Ahlemeyer of Burns & McDonnell and Jeff Smith of OCCU-TEC conducted area air-sampling for the presence of seven (7) of the RCRA metals including arsenic, barium, cadmium, chromium, lead, selenium, and silver. Sampling was conducted in various locations throughout Building 104E.

The sampling scheme, number of samples, sample distribution, and general methodology was developed based on previous investigation methodology and in coordination with the GSA. Sample locations and samples collected from discretionary locations were determined by sampling personnel while on-site.

Air samples for RCRA metals were collected on 37-millimeter (mm) cassettes with 0.8 micrometer ( $\mu\text{m}$ ) mixed cellulose ester (MCE) filters, using powered air sampling pumps, in accordance with the National Institute for Occupational Safety and Health (NIOSH) Method 7300. The sampling strategy included collecting a minimum sample volume of 500 liters based on the calibrated pump flow rate and sample duration. Air samples were submitted under chain-of-custody to Environmental Hazards Services, LLC (EHS) in Richmond, Virginia for independent analysis of 7 RCRA metals according to NIOSH method 7300. EHS is accredited under the American Industrial Hygiene Association (AIHA) Industrial Hygiene Laboratory Accreditation Program (IHLAP) program, identification number LAP-100420.

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**RESULTS AND DISCUSSION**

Results of the air sampling are summarized in the table below by identifying the range of results for Building 104E for each of the seven (7) metals that were sampled. Results indicate that all 9 air samples collected from Building 104E and analyzed for RCRA metals were below their respective OSHA Permissible Exposure Limit (PEL), as based on a time-weighted-average.

**Table 1. Summary of Air Sampling Results**

Analyte	Lowest Concentration <sup>(a)</sup> (µg/m <sup>3</sup> ) <sup>(b)</sup>	Highest Concentration <sup>(a)</sup> (µg/m <sup>3</sup> ) <sup>(b)</sup>	Permissible Exposure Limit (PEL) (µg/m <sup>3</sup> ) <sup>(b)</sup>
Arsenic	<0.25	<0.35	10
Barium	<0.25	<0.35	500
Cadmium	<0.050	<0.070	5
Chromium (Total)	<1.3	<1.8	500
Lead	<0.25	<0.35	50
Selenium	<1.3	<1.8	200
Silver	<0.25	<0.35	10

Notes:

- (a) Samples with a “<” sign indicate that the results were below the laboratory’s reporting limit, which varies based on sample air volume.
- (b) µg/m<sup>3</sup> = micrograms per cubic meter of air.

GSA may choose to compare results with guidance limits from additional organizations for risk evaluation, including but not limited to the American Conference of Governmental Industrial Hygienists (ACGIH) and/or the World Health Organization (WHO).

A summary table of all sampling results by location is included in Appendix A. The complete laboratory report for the air sampling from EHS is attached in Appendix B. The air sampling professional’s Missouri Lead license is included in Appendix C.

**LIMITATIONS**

The scope of this assessment was limited as follows. Burns & McDonnell collected samples from a select number of locations in an effort to minimize cost while providing a general overview of the air quality at the site. Sample locations do not encompass every indoor space at the site. Additionally, based on previous sampling history, samples were only analyzed for a select number of potential contaminants likely to affect the air quality at the site. Burns &



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McDonnell is not responsible for potential contaminants not identified in this report. This report was prepared for the sole use of GSA.

Burns & McDonnell appreciates the opportunity to work with the General Services Administration 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)

A large black rectangular redaction box covers the signature area, with the text '(b) (6)' written in white at the top left corner of the box.

Matt Shanahan, CHMM  
Project Manager

Attachments:

- Appendix A – Results Summary by Location
- Appendix B – Air Sample Laboratory 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](mailto:r6environmental@gsa.gov).

**APPENDIX A – RESULTS SUMMARY BY LOCATION**

## Appendix A

### Results Summary by Location

Sample Number	Location	Analyte	Result	Units	Recommended Limits <sup>1</sup>
104E-A-01	1st floor, south reception area	Arsenic	< 0.26	µg/m <sup>3</sup>	10
		Barium	< 0.26	µg/m <sup>3</sup>	500
		Cadmium	< 0.052	µg/m <sup>3</sup>	5
		Chromium	< 1.3	µg/m <sup>3</sup>	500
		Lead	< 0.26	µg/m <sup>3</sup>	50
		Selenium	< 1.3	µg/m <sup>3</sup>	200
		Silver	< 0.26	µg/m <sup>3</sup>	10
104E-A-02	1st floor, break room	Arsenic	< 0.26	µg/m <sup>3</sup>	10
		Barium	< 0.26	µg/m <sup>3</sup>	500
		Cadmium	< 0.052	µg/m <sup>3</sup>	5
		Chromium	< 1.3	µg/m <sup>3</sup>	500
		Lead	< 0.26	µg/m <sup>3</sup>	50
		Selenium	< 1.3	µg/m <sup>3</sup>	200
		Silver	< 0.26	µg/m <sup>3</sup>	10
104E-A-03	1st floor, server room	Arsenic	< 0.27	µg/m <sup>3</sup>	10
		Barium	< 0.27	µg/m <sup>3</sup>	500
		Cadmium	< 0.053	µg/m <sup>3</sup>	5
		Chromium	< 1.4	µg/m <sup>3</sup>	500
		Lead	< 0.27	µg/m <sup>3</sup>	50
		Selenium	< 1.4	µg/m <sup>3</sup>	200
		Silver	< 0.27	µg/m <sup>3</sup>	10
104E-A-04	Basement	Arsenic	< 0.26	µg/m <sup>3</sup>	10
		Barium	< 0.26	µg/m <sup>3</sup>	500
		Cadmium	< 0.051	µg/m <sup>3</sup>	5
		Chromium	< 1.3	µg/m <sup>3</sup>	500
		Lead	< 0.26	µg/m <sup>3</sup>	50
		Selenium	< 1.3	µg/m <sup>3</sup>	200
		Silver	< 0.26	µg/m <sup>3</sup>	10
104E-A-05	2nd floor, outside NFAOC space	Arsenic	< 0.25	µg/m <sup>3</sup>	10
		Barium	< 0.25	µg/m <sup>3</sup>	500
		Cadmium	< 0.050	µg/m <sup>3</sup>	5
		Chromium	< 1.3	µg/m <sup>3</sup>	500
		Lead	< 0.25	µg/m <sup>3</sup>	50
		Selenium	< 1.3	µg/m <sup>3</sup>	200
		Silver	< 0.25	µg/m <sup>3</sup>	10

## Appendix A

### Results Summary by Location

Sample Number	Location	Analyte	Result	Units	Recommended Limits <sup>1</sup>
104E-A-06	2nd floor, canopy café	Arsenic	< 0.35	µg/m <sup>3</sup>	10
		Barium	< 0.35	µg/m <sup>3</sup>	500
		Cadmium	< 0.070	µg/m <sup>3</sup>	5
		Chromium	< 1.8	µg/m <sup>3</sup>	500
		Lead	< 0.35	µg/m <sup>3</sup>	50
		Selenium	< 1.8	µg/m <sup>3</sup>	200
		Silver	< 0.35	µg/m <sup>3</sup>	10
104E-A-07	2nd floor, south end of NFAOC	Arsenic	< 0.25	µg/m <sup>3</sup>	10
		Barium	< 0.25	µg/m <sup>3</sup>	500
		Cadmium	< 0.050	µg/m <sup>3</sup>	5
		Chromium	< 1.3	µg/m <sup>3</sup>	500
		Lead	< 0.25	µg/m <sup>3</sup>	50
		Selenium	< 1.3	µg/m <sup>3</sup>	200
		Silver	< 0.25	µg/m <sup>3</sup>	10
104E-A-08	North penthouse	Arsenic	< 0.25	µg/m <sup>3</sup>	10
		Barium	< 0.25	µg/m <sup>3</sup>	500
		Cadmium	< 0.050	µg/m <sup>3</sup>	5
		Chromium	< 1.3	µg/m <sup>3</sup>	500
		Lead	< 0.25	µg/m <sup>3</sup>	50
		Selenium	< 1.3	µg/m <sup>3</sup>	200
		Silver	< 0.25	µg/m <sup>3</sup>	10
104E-A-09	Field blank	Arsenic	< 0.15	µg	--
		Barium	< 0.15	µg	--
		Cadmium	< 0.030	µg	--
		Chromium	< 0.75	µg	--
		Lead	< 0.15	µg	--
		Selenium	< 0.75	µg	--
		Silver	< 0.15	µg	--

Notes:

<sup>1</sup>Limits equal to the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs)

**APPENDIX B – AIR SAMPLE LABORATORY REPORT**



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

## Air Metals Analysis Report

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

Report Number: 20-12-00710  
 Received Date: 12/07/2020  
 Reported Date: 12/22/2020

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd; 104E-A-01-104E-A-09

Client Number:  
26-3514

Fax Number:  
816-822-3494

# Laboratory Results

Lab Sample Number	Client Sample Number	Analyzed Date	Analyte	Air Volume (L)	Total Metal (ug)	Concentration (ug/m <sup>3</sup> )	Narrative ID
20-12-00710-001	104E-A-01	12/09/2020	Arsenic (As)	588	<0.15	<0.26	
			Barium (Ba)		<0.15	<0.26	
			Cadmium (Cd)		<0.030	<0.052	
			Chromium (Cr)		<0.75	<1.3	
			Lead (Pb)		<0.15	<0.26	
			Selenium (Se)		<0.75	<1.3	
			Silver (Ag)		<0.15	<0.26	
20-12-00710-002	104E-A-02	12/09/2020	Arsenic (As)	585	<0.15	<0.26	
			Barium (Ba)		<0.15	<0.26	
			Cadmium (Cd)		<0.030	<0.052	
			Chromium (Cr)		<0.75	<1.3	
			Lead (Pb)		<0.15	<0.26	
			Selenium (Se)		<0.75	<1.3	
			Silver (Ag)		<0.15	<0.26	
20-12-00710-003	104E-A-03	12/09/2020	Arsenic (As)	573	<0.15	<0.27	
			Barium (Ba)		<0.15	<0.27	
			Cadmium (Cd)		<0.030	<0.053	



# Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 20-12-00710

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd; 104E-A-01-104E-A-09

Lab Sample Number	Client Sample Number	Analyzed Date	Analyte	Air Volume (L)	Total Metal (ug)	Concentration (ug/m <sup>3</sup> )	Narrative ID
			Chromium (Cr)		<0.75	<1.4	
			Lead (Pb)		<0.15	<0.27	
			Selenium (Se)		<0.75	<1.4	
			Silver (Ag)		<0.15	<0.27	
20-12-00710-004	104E-A-04	12/09/2020	Arsenic (As)	592	<0.15	<0.26	
			Barium (Ba)		<0.15	<0.26	
			Cadmium (Cd)		<0.030	<0.051	
			Chromium (Cr)		<0.75	<1.3	
			Lead (Pb)		<0.15	<0.26	
			Selenium (Se)		<0.75	<1.3	
			Silver (Ag)		<0.15	<0.26	
20-12-00710-005	104E-A-05	12/09/2020	Arsenic (As)	602	<0.15	<0.25	
			Barium (Ba)		<0.15	<0.25	
			Cadmium (Cd)		<0.030	<0.050	
			Chromium (Cr)		<0.75	<1.3	
			Lead (Pb)		<0.15	<0.25	
			Selenium (Se)		<0.75	<1.3	
			Silver (Ag)		<0.15	<0.25	
20-12-00710-006	104E-A-06	12/09/2020	Arsenic (As)	430	<0.15	<0.35	
			Barium (Ba)		<0.15	<0.35	
			Cadmium (Cd)		<0.030	<0.070	
			Chromium (Cr)		<0.75	<1.8	
			Lead (Pb)		<0.15	<0.35	
			Selenium (Se)		<0.75	<1.8	
			Silver (Ag)		<0.15	<0.35	

# Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 20-12-00710

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd; 104E-A-01-104E-A-09

Lab Sample Number	Client Sample Number	Analyzed Date	Analyte	Air Volume (L)	Total Metal (ug)	Concentration (ug/m <sup>3</sup> )	Narrative ID
20-12-00710-007	104E-A-07	12/09/2020	Arsenic (As)	603	<0.15	<0.25	
			Barium (Ba)		<0.15	<0.25	
			Cadmium (Cd)		<0.030	<0.050	
			Chromium (Cr)		<0.75	<1.3	
			Lead (Pb)		<0.15	<0.25	
			Selenium (Se)		<0.75	<1.3	
			Silver (Ag)		<0.15	<0.25	
20-12-00710-008	104E-A-08	12/09/2020	Arsenic (As)	600	<0.15	<0.25	
			Barium (Ba)		<0.15	<0.25	
			Cadmium (Cd)		<0.030	<0.050	
			Chromium (Cr)		<0.75	<1.3	
			Lead (Pb)		<0.15	<0.25	
			Selenium (Se)		<0.75	<1.3	
			Silver (Ag)		<0.15	<0.25	
20-12-00710-009	104E-A-09	12/09/2020	Arsenic (As)	--	<0.15	---	
			Barium (Ba)		<0.15	---	
			Cadmium (Cd)		<0.030	---	
			Chromium (Cr)		<0.75	---	
			Lead (Pb)		<0.15	---	
			Selenium (Se)		<0.75	---	
			Silver (Ag)		<0.15	---	

# Environmental Hazards Services, L.L.C

Client Number: 26-3514

Report Number: 20-12-00710

Project/Test Address: 168765; GFC; 4300 Goodfellow Blvd; 104E-A-01-104E-A-09

Lab Sample Number	Client Sample Number	Analyzed Date	Analyte	Air Volume (L)	Total Metal (ug)	Concentration (ug/m <sup>3</sup> )	Narrative ID
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Sample Narratives:

Method: NIOSH 7300M  
Analyst: Brittany Meyer

(b) (6)

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 15mL volume. The reporting limit is 0.03ug for Cadmium, 0.15ug for Arsenic, Barium, Lead and Silver, and 0.75ug for Chromium and Selenium.

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/m <sup>3</sup> = micrograms per cubic meter
	mL = milliliter	L= Liters

# ENVIRONMENTAL HAZARDS SERVICES, LLC

## Metals Chain of Custody Form

Pg 1 of 1

Company Name <b>Burns &amp; McDonnell</b>	Account # <b>26-3514</b>
Company Address <b>9400 Ward Parkway</b>	City/State/Zip <b>Kansas City, MO 64114</b>
Phone <b>314-302-4661</b>	Email <b>eaahlemeyer@burnsmcd.com</b>
Project Name / Testing Address <b>GFC/4300 Goodfellow Blvd</b>	
PO Number <b>168765</b>	Collected By <b>Emily Ahlemeyer &amp; Jeff Smith</b>
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 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	104E-A-01	12/4/2020 0816							Ag, As, Ba, Cd, Cr, Pb, Se						224	2.63	588	x	
2	104E-A-02	0812												223	2.63	585	x		
3	104E-A-03	0813												224	2.56	573	x		
4	104E-A-04	0815												230	2.58	592	x		
5	104E-A-05	0818												237	2.54	602	x		
6	104E-A-06	0820												166	2.59	430	x		
7	104E-A-07	0822												237	2.55	603	x		
8	104E-A-08	0825												228	2.63	600	x		
9	104E-A-09	0934												NA	NA	NA	x		
10																	x		
11																	x		
12																	x		
13																	x		
14																	x		
15																	x		

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

LAB USE ONLY - BELOW THIS LINE

Received By: Stone

Signature: (b) (6)

Date: 12, 7, 20 Time: 11:20  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)

20-12-00710

Due Date:  
**12/10/2020**  
(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