National Guard Bureau
Mid-West Regional Industrial Hygiene Office
301-IH Old Bay Lane
Havre de Grace, MD 21078

ARNG-CSG-P September 3, 2014

MEMORANDUM FOR: The Adjutant General for Indiana

SUBJECT: Industrial Hygiene Survey at Brazil Armory, Brazil, Indiana

National Guard Bureau (NGB) Mid-West Regional Industrial Hygiene (IH) Office field personnel conducted a survey on July 18, 2014 at the Indiana Army National Guard Brazil Armory, located at 970 West Craig Avenue, Brazil, Indiana. The site point of contact was Non-Responsive. This IH survey included a walkthrough of the facility and surface wipe sampling for lead. In addition, the ventilation system in the kitchen was evaluated.

Occupational health risk assessment codes (RACs) are assigned to quantify health risks to personnel IAW DOD Letter of Instruction 6055.1, *DOD Safety and Occupational Health Program*. Risk assessment is an expression of health hazard severity and mishap probability, described in terms of route of exposure, actual exposure, exposure limit standards, potential health effects, duration of exposure, and number of exposed personnel. Guidance for RAC determination is attached to this memorandum.

Surface Wipe Sampling: Wipe samples were collected on representative surfaces in the facility and analyzed for lead. For purposes of this report, any results that exceed the guidelines adopted by the NGB Mid-West Regional IH Office are considered significant. None of the surface wipe sample results exceeded guidelines for lead. The following actions are required:

- Continue to clean the horizontal surfaces of the facility using high-efficiency particulate air (HEPA) filter vacuum and/or wet methods. (RAC 3)

- Continue to prohibit the presence of food and drink in work areas and stress the importance of hand washing prior to the consumption of food items. (RAC 3)

Ventilation: The ventilation system in the kitchen was evaluated and was not adequate for the tasks performed. There is no exhaust hood in the kitchen to capture smoke, grease-laden vapors, odors and excessive heat produced by the range/oven IAW criteria established by the American Conference of Governmental Industrial Hygienists (ACGIH) *Industrial Ventilation, A Manual of Recommended Practice for Design,* NGB Design Guide 415-1, *Readiness Centers Design Guide*, and TB MED 530, *Tri-Service Food Code*. The following actions are required:

- Install a Type I medium duty kitchen hood over the range/oven that provides a minimum exhaust flow rate of 300 cubic feet per minute per linear foot of hood length and a capture velocity at the cooking surface of 75 feet per minute. Follow the design criteria published in

the ACGIH manual and TB MED 530. Determine if the existing roof exhaust fan may be used or if a new fan is required to support these ventilation rates. (RAC 2)

- Coordinate with the safety office to ensure the kitchen ventilation system meets the fire protection provisions specified in National Fire Protection Association (NFPA) Standard 96, *Ventilation Control and Fire Protection of Commercial Cooking Operations,* and/or applicable local fire protection codes. (RAC 2)
- Provide mechanical cooling to the kitchen to minimize potential heat stress concerns. (RAC 3)
- Configure the exhaust fan and the passive air intake for the adjacent maintenance area so that kitchen smoke and grease-laden vapors are not back-drafted into the maintenance area. (RAC 3)

The NGB conducted this survey in the interest of preventing employee illness and to meet legal obligations where applicable. Results and recommendations are based on information provided by site personnel, field measurements, and conditions observed during the survey. Any change in processes, work practices, or materials requires additional sampling to characterize employee exposures. For any further questions, please contact Non-Responsive

Non-Responsive

Non-Responsive

Regional Industrial Hygienist

Appendix	Title	Status
A.	Metals.....	Attached
B.	Organic Vapors.....	N/A
C.	Noise.....	N/A
D.	Ventilation.....	Attached

Occupational Health Risk Assessment Codes
(Reference: DOD Letter of Instructions 6055.1)

Occupational health risk assessment codes (RACs) are included in this report to quantify health risks to personnel. Risk assessment is an expression of health hazard severity and mishap probability, described in terms of route of exposure, actual exposure, exposure limit standards, potential health effects, duration of exposure, and number of exposed personnel. The following procedure is used to determine the RACs:

STEP 1: This step assesses points to determine the health hazard severity category (HHSC). The HHSC reflects the magnitude of exposure to a physical, chemical, or biological agent and the medical effects of exposure.

A. Exposure Points Assessed.

Alternate Route of Exposure			Exposure Conditions			
			<CT	Occasionally >CT Always ≤STD	>CT <STD	>STD
AER	Possible	NO	0	3	5	7
		YES	1-2	4	6	8

Notes:

1) AER = Alternate exposure route, such as skin absorption or ingestion.
2) CT = DoD component threshold that triggers surveillance actions, such as action level.
3) STD = DoD exposure limit, such as TLV or PEL.
4) > = Greater than. 5) < = Less than.
6) ≤ = Less than or equal to.

B. Medical Effects Points Assessed.

Condition	Points
No medical effects, such as nuisance noise and nuisance odor	0
Temporary reversible illness requiring supportive treatment, such as eye irritation and sore throat	1-2
Temporary reversible illness with a variable but limited period of disability, such as metal fume fever	3-4
Permanent, nonsevere illness or loss of capacity, such as permanent hearing loss	5-6
Permanent, severe, disabling, irreversible illness or death, such as asbestosis or lung cancer	7-8

C. The HHSC is determined by totaling the points assessed and using the following guide:

Total Points*	HHSC
13-16	I
9-12	II
5-8	III
0-4	IV

* Sum of A and B above.

STEP 2: This step uses the following guidelines to assess points to determine the mishap probability category (MPC) for health hazards. The probability of mishap reflects the duration of exposure and the number of exposed personnel.

A. Duration of Exposure Points Assessed.

Type of Exposure	Length of Exposure		
	1-8 hr/wk	>8 hr/wk/not continuous	Continuous
Irregular/ Intermittent	1-2	4-6	NA
Regular/Periodic	2-3	5-7	8

B. Number of Exposed personnel Points Assessed.

Number of Exposed Personnel	Points
<5	1-2
5-9	3-4
10-49	5-6
>49	7-8

C. The MPC for health hazards is determined by totaling the points assessed and using the following guide:

Total Points*	MPC
14-16	A
10-13	B
5-9	C
<5	D

* Sum of A and B above.

STEP 3: The RAC is determined using the following matrix:

HHSC	MPC			
	A	B	C	D
I	1	1	2	3
II	1	2	3	4
III	2	3	4	5
V	3	4	5	5

Appendix A
Metals

Surface Wipe Sampling

There is no active or renovated firing range in the facility (Figure A-1) and weapons are cleaned on the drill floor. Children use this facility on a regular basis and the drill floor is available for public use by community groups. The facility was constructed in the 1950s.

Wipe samples were collected from representative areas of the facility using Environmental Express Ghost™ Wipes and templates IAW the Occupational Safety and Health Administration (OSHA) wipe sampling method (OSHA Technical Manual, Appendix II, 2-1). The samples were analyzed for lead by OSHA Method ID-121. The results and photos are contained in Table A-1.

Although OSHA does not have published exposure standards for lead surface contamination, the 29 CFR 1910.1025(h)(1) requires that all surfaces must be kept as free as practicable of accumulations of lead dust. The NGB Mid-West Regional IH Office has adopted the guidelines for lead dust published in NG PAM 420-15, *Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges*. For purposes of this report, any surface lead level that exceeds 40 micrograms per square foot (µg/ft^2) in a potentially child occupied area is considered significant. NGB IH considers facilities with routine public access to be potentially child occupied facilities. Any surface lead level that exceeds 200 µg/ft^2 in any other work area of the facility is considered significant. None of the surface wipe sample results exceeded applicable guidelines for lead. There was some detectable lead measured in the drill floor area.

Figure A-1. Facility Photo.

Recommendations:

Continue to clean the horizontal surfaces in the facility to prevent the accumulation of lead dust from weapon cleaning using high-efficiency particulate air (HEPA) filter vacuums or wet methods. (RAC 3)

Continue to prohibit the presence of food and drink in work areas and stress the importance of hand washing prior to the consumption of food items. (RAC 3)

Table A-1
Surface Wipe Sampling Results for Lead
Indiana Army National Guard, Brazil Armory
July 18, 2014

Sample #	Location	Photo	Template Size	Lead (µg/ft^2)
Surface Guidelines				**40 (child occupied) 200 (other areas)**
INBA-W1	Kitchen on top of microwave		12” x 12”	<10
INBA-W2	Drill floor on soda machine		12” x 12”	24
INBA-W3	WIC office on cabinet		12” x 12”	<10
INBA-W4	Supply room on file cabinet near vault		4” x 4”	<91
INBA-W5	Classroom 3 on television stand		4” x 4”	<91
INBA-W6	Blank	N/A	N/A	ND

Notes: 1) µg / ft^2 = micrograms per square foot of surface area. 2) N/A = not applicable. 3) ND = none detected. 4) “<” means less than the reporting limit for the analytical method. 5) A 12” by 12” template was used to collect samples for child occupied areas; a 4” by 4” template was used to collect samples for other work areas.

Laboratory Result Reports and Chain of Custody Sheets

FOH ENVIRONMENTAL LABORATORY
538 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

ANALYTICAL REPORT

Submitted To: USPHS / Federal Occupational Health
Denver Federal Center
Denver, CO 80225

Attention: Non-Responsive

Submitted By:

Reference Data: Lead
Sampling Site: NGB: Brazil, IN (Armory)
Sample Media: Ghost Wipe(s)®
Method Reference: OSHA ID-121
Project ID: Project 11922R
DFOH Lab Nos.: TM-14-69619 through TM-14-69624
Date Received: 07/22/14
Data Analyzed: 07/23/14 – 07/24/14
Date Issued: 07/24/14

The wipe samples were hot plate digested. The samples were run on a Perkin Elmer 200 flame atomic absorption spectrophotometer (AA).

General Lab Comments:
All quality control criteria have been met.
* All samples received in condition acceptable for analysis unless otherwise noted.
** Sample results have not been corrected for contamination based on the field blank or other analytical blank unless otherwise noted.

Analytical results are given on the enclosed tables. Results relate only to items tested. If you have any questions about these results, feel free to phone the Laboratory at (312) 886-0413.

Non-Responsive

AIHA LAP, LLC
ACCREDITED LABORATORY

Project 11922R
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FOH ENVIRONMENTAL LABORATORY

538 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

LEAD on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
INBA-W1	TM-14-69619	<10	<10
INBA-W2	TM-14-69620	24	24
INBA-W3	TM-14-69621	<10	<10
INBA-W4	TM-14-69622	<10	<91
INBA-W5	TM-14-69623	<10	<91
INBA-W6**	TM-14-69624	<10	

AGENCY	FLOORS	INTERIOR WINDOW SILLS	WINDOW TROUGHS
EPA	40 µg/ft²	250 µg/ft²	400 µg/ft²

Metals in Wipe Limits
(based on one ft² sampled area)

Analyte	Analytical Method	Method Detection Limit	Minimum Reporting Limit
Lead	OSHA ID-121	5.0 µg/ft²	10 µg/ft²

Non-Responsive

AIHA LAP, LLC
ACCREDITED LABORATORY

Project 11922R
Page 2 of 2

US PUBLIC HEALTH SERVICE, FEDERAL OCCUPATIONAL HEALTH CHAIN-OF-CUSTODY / FIELD DATA SHEET

Environmental Laboratory
536 S. Clark Street South, Suite 714
Chicago, IL 60605-1521
Tel: (312)-886-0413 Fax: (312)-886-0434

Non-Responsive

Non-Responsive

PROJECT REFERENCE

Agreement No.:	A 106644
Statement of Work No.:	S 180648
Project No:	P 189649
Agency	ARNG
Proj. Manager	
Location (City, State):	Armory Brazil, IN

For Lab Use Only
Project /Report #: 11922
Due Date: 8/28/14
Samples Received Chilled? Yes (circle one)

Conditions on Receipt with Name & Date

Water Sample Codes*
Container Types: P-Plastic, G-Glass, V-VOC
Preservatives: A-None, B-H_2SO_4, C-HNO_3, D-NaOH

Turn Around Time Codes*
STD- Standard
3D- Three Day Rush**
WH- Weekend/Holiday*

Analysis Requested

Sample ID #	Type*	Media*	Collected Date	Collected Time	Sample Location / Description	Air Flow (LPM)	Air Time (Min.)	Air Volume (Liters)	Wipe Area (ft^2)	Water Volume (Liters)	Water Code*	Turn Around Time*	Lab ID #	Lead
INBA-W1	T	S	18 JULY						1.0			STD	TM-14-69619	✓
INBA-W2									1.0				69620	✓
INBA-W3									1.0				69621	✓
INBA-W4									0.11				69622	✓
INBA-W5									0.11				69623	✓
INBA-W6	↓	↓	↓						—			↓	69624	✓

Sample Type Codes:
1-Air 2-Water 3-Paint 4-Soil 5-Dust
6-Bulk 7-Wipe 8-Other

Sample Media Codes:
1-Charcoal 2-Matched Weight, 8 Bum
3-PUC filter 4-M CE 0.8 um, 37 mm
5-Ghost Wipes™ 6-Filter w/ badge
7-Other

Non-Responsive

Non-Responsive

COMMENTS: Please forward results t

* Applied to organic and inorganic analysis in cases of an emergency only. ** Applied to inorganic and organic samples. SD: Applied to organic and inorganic samples 7-10 business days.

Appendix D
Ventilation

The kitchen ventilation was evaluated for this facility in response to a request from the INARNG Occupational Health Nurse who observed smoke on the drill floor during a previous visit. The drill floor is adjacent to the kitchen. The kitchen staff was interviewed and provided the following information:

- Visible emissions from the kitchen have escaped onto the drill floor area and caused disruptions in activities. Smoke also "pours" out the back door limiting visibility in the kitchen due to all the smoke in this space.

- The ceiling exhaust grille is not adequate to collect emissions from the range/oven, especially when using the griddle. There is no wall switch for manual operation of the roof exhaust fan.

- Smoke from the kitchen sometimes enters the adjacent maintenance area through the ceiling grille in the maintenance area.

- Workers routinely open the door from the drill floor and the back door to assist in cross ventilating the space. They position portable floor fans at the drill floor door and at the outside door to assist with clearing the room of smoke and to provide cooling.

- The kitchen does not have central mechanical cooling and there is no window air conditioning unit.

- The kitchen is used up to three weeks per month during annual training.

A TSI Alnor Model AVM430A thermal anemometer calibrated according to the manufacturer's specifications was used to evaluate the kitchen exhaust ventilation system at this facility. Ventilation rates were compared to criteria established by the ACGIH *Industrial Ventilation, A Manual of Recommended Practice for Design,* NGB Design Guide 415-1, *Readiness Centers Design Guide*, and TB MED 530, *Tri-Service Food Code*. In addition, smoke tubes were used to evaluate the kitchen exhaust fan function.

The kitchen general room ventilation exhausts 6.3 cubic feet per minute (cfm) per square foot of room space which meets the NGB DG 415-1 room exhaust rate of 1 cfm per square foot; however, ACGIH, DG 415-1, and TB MED 530 also specify the use of an exhaust hood for cooking appliances such as kettles, ranges, griddles, and fryers. There is no hood system in the kitchen to capture smoke, grease-laden vapors, odors and excessive heat produced by the range/oven IAW ACGIH, DG 415-1, and TB MED 530 requirements.

Observations	Photos	
The kitchen is adjacent to the drill floor and the room dimensions are approximately 20' x 10' x 10'. The day of the survey, seven personnel were working in the kitchen (heating pulled pork on the range top and baking French fries in the oven).		
The room exhaust system consists of a ceiling exhaust grille (arrow) above the range/oven and a dedicated roof exhaust fan (circle). There is no kitchen exhaust hood.		
Supply air is provided from the building air handler. A supply air grille is located in the ceiling near the outside door. The placement of the supply and exhaust grilles is not optimal and short circuiting without good air distribution is likely. There is no sprinkler coverage in this space. A portable fire extinguisher was available in the kitchen area.		

Observations	Photos	
A portable floor fan was in use at the drill floor door to assist with clearing the room of smoke and to provide cooling. The back door on the kitchen storage addition was also open to assist in cross ventilating the space. The outside dry bulb temperature on the day of the survey was 60 °F (0800-0900). There is a potential heat stress hazard in the kitchen on warmer days. In cold weather, this configuration is not feasible.		
The smoke emitter test demonstrated that the ceiling exhaust fan is not adequate to capture emissions above the range/oven. Note the smoke is not moving towards the exhaust grille.		
Exhaust from the kitchen reportedly enters the adjacent maintenance area through the ceiling grille (re-entrained from the kitchen exhaust fan on the roof and back-drafted through the passive grille in the maintenance area). The ceiling grille in the maintenance area was blocked off with cardboard because of this issue.		

Recommendations:

1. Install a Type I medium duty kitchen hood over the range/oven that provides a minimum exhaust flow rate of 300 cubic feet per minute per linear foot of hood length and a capture velocity at the cooking surface of 75 feet per minute. Follow the design criteria published in the ACGIH manual and TB MED 530. Determine if the existing roof exhaust fan may be used or if a new fan is required to support these ventilation rates. (RAC 2)

2. Coordinate with the safety office to ensure the kitchen ventilation system meets the fire protection provisions specified in National Fire Protection Association (NFPA) Standard 96, *Ventilation Control and Fire Protection of Commercial Cooking Operations,* and/or applicable local fire protection codes. (RAC 2)

3. Provide mechanical cooling to the kitchen to minimize potential heat stress concerns. (RAC 3)

4. Configure the exhaust fan and the passive air intake for the adjacent maintenance area so that kitchen smoke and grease-laden vapors are not back-drafted into the maintenance area. (RAC 3)

National Guard Bureau
Mid-West Regional Industrial Hygiene Office
301-IH Old Bay Lane
Havre de Grace, MD 21078

ARNG-CSG-P August 28, 2014

MEMORANDUM FOR: The Adjutant General for Indiana

SUBJECT: Industrial Hygiene Survey at Johnson County Armory Maintenance Training Bay, Franklin, Indiana

National Guard Bureau (NGB) Mid-West Regional Industrial Hygiene (IH) Office field personnel conducted a survey on July 17, 2014 at the Indiana Army National Guard Johnson County Armory Maintenance Bay, located at 325 Minute Man Way, Franklin, Indiana. The site point of contact was Non-Responsive . This IH survey included a walkthrough of the facility and surface wipe sampling for heavy metals. In addition, the local exhaust ventilation systems and illumination levels were tested.

Occupational health risk assessment codes (RACs) are assigned to quantify health risks to personnel IAW DOD Letter of Instruction 6055.1, *DOD Safety and Occupational Health Program*. Risk assessment is an expression of health hazard severity and mishap probability, described in terms of route of exposure, actual exposure, exposure limit standards, potential health effects, duration of exposure, and number of exposed personnel. Guidance for RAC determination is attached to this memorandum.

Surface Wipe Sampling: Wipe samples were collected on representative surfaces in the facility and analyzed for toxic metals (lead, cadmium, and chromium). For purposes of this report, any results that exceed the guidelines adopted by the NGB Mid-West Regional IH Office are considered significant. Three of the surface wipe sample results exceeded guideline for cadmium. The following actions are required:

- Clean the horizontal surfaces of the facility using high-efficiency particulate air (HEPA) filter vacuum and/or wet methods. (RAC 2)

- Continue to prohibit the presence of food and drink in work areas and stress the importance of hand washing prior to the consumption of food items. (RAC 3)

Ventilation: The tailpipe exhaust systems were not operational and were not tested. This facility is only used on a part-time basis for drill weekends and the available staff did not know how to operate the tailpipe exhaust systems. Calibration information for the carbon monoxide detection system was not available. The battery and hazardous materials storage room are used for storage of equipment and supplies and are not currently used for their designed purpose. The following actions are required:

- Ensure the carbon monoxide detection system is calibrated according to the manufacturer's instructions. (RAC 2)

- Determine how to operate the tailpipe exhaust systems and schedule ventilation testing with industrial hygiene personnel. (RAC 2)

- If the battery or the hazardous materials storage rooms are ever used for their intended purpose, schedule ventilation testing with industrial hygiene personnel. (RAC 4)

Lighting: Facility lighting was evaluated during this survey. Illumination levels were only partially met in the maintenance bays and the tool room. The following actions are required:

- Increase the illumination levels in the maintenance bays and tool room or provide supplemental lighting. (RAC 4)

The NGB conducted this survey in the interest of preventing employee illness and to meet legal obligations where applicable. Results and recommendations are based on information provided by site personnel, field measurements, and conditions observed during the survey. Any change in processes, work practices, or materials requires additional sampling to characterize employee exposures. For any further questions, please contact Non-Responsive

[redacted]

[redacted]

Non-Responsive

Regional Industrial Hygienist

Appendix	Title	Status
A.	Metals.....	Attached
B.	Organic Vapors.....	N/A
C.	Noise.....	N/A
D.	Ventilation.....	Attached
E.	Lighting.....	Attached

Occupational Health Risk Assessment Codes
(Reference: DOD Letter of Instructions 6055.1)

Occupational health risk assessment codes (RACs) are included in this report to quantify health risks to personnel. Risk assessment is an expression of health hazard severity and mishap probability, described in terms of route of exposure, actual exposure, exposure limit standards, potential health effects, duration of exposure, and number of exposed personnel. The following procedure is used to determine the RACs:

STEP 1: This step assesses points to determine the health hazard severity category (HHSC). The HHSC reflects the magnitude of exposure to a physical, chemical, or biological agent and the medical effects of exposure.

A. Exposure Points Assessed.

Alternate Route of Exposure			Exposure Conditions			
			<CT	Occasionally >CT Always ≤STD	>CT <STD	>STD
AER	Possible	NO	0	3	5	7
		YES	1-2	4	6	8

Notes:

1) AER = Alternate exposure route, such as skin absorption or ingestion.
2) CT = DoD component threshold that triggers surveillance actions, such as action level.
3) STD = DoD exposure limit, such as TLV or PEL.
4) > = Greater than. 5) < = Less than.
6) ≤ = Less than or equal to.

B. Medical Effects Points Assessed.

Condition	Points
No medical effects, such as nuisance noise and nuisance odor	0
Temporary reversible illness requiring supportive treatment, such as eye irritation and sore throat	1-2
Temporary reversible illness with a variable but limited period of disability, such as metal fume fever	3-4
Permanent, nonsevere illness or loss of capacity, such as permanent hearing loss	5-6
Permanent, severe, disabling, irreversible illness or death, such as asbestosis or lung cancer	7-8

C. The HHSC is determined by totaling the points assessed and using the following guide:

Total Points*	HHSC
13-16	I
9-12	II
5-8	III
0-4	IV

* Sum of A and B above.

STEP 2: This step uses the following guidelines to assess points to determine the mishap probability category (MPC) for health hazards. The probability of mishap reflects the duration of exposure and the number of exposed personnel.

A. Duration of Exposure Points Assessed.

Type of Exposure	Length of Exposure		
	1-8 hr/wk	>8 hr/wk/not continuous	Continuous
Irregular/ Intermittent	1-2	4-6	NA
Regular/Periodic	2-3	5-7	8

B. Number of Exposed personnel Points Assessed.

Number of Exposed Personnel	Points
<5	1-2
5-9	3-4
10-49	5-6
>49	7-8

C. The MPC for health hazards is determined by totaling the points assessed and using the following guide:

Total Points*	MPC
14-16	A
10-13	B
5-9	C
<5	D

* Sum of A and B above.

STEP 3: The RAC is determined using the following matrix:

HHSC	MPC			
	A	B	C	D
I	1	1	2	3
II	1	2	3	4
III	2	3	4	5
V	3	4	5	5

Appendix A
Metals

Surface Wipe Sampling

Wipe samples were collected from representative areas of the facility (Figure A-1) using Environmental Express Ghost™ Wipes and templates IAW the OSHA wipe sampling method (OSHA Technical Manual, Appendix II, 2-1). The samples were analyzed for toxic metals by OSHA Method ID-121. The results and photos are contained in Table A-1.

Although OSHA does not have published exposure standards for metal surface contamination, 29 CFR 1910 requires that all surfaces must be kept as free as practicable of accumulations of toxic metal dusts. In addition, DOD has instituted a policy to minimize surface contamination levels of heavy metals (*Control and Management of Surface Accumulations from Lead, Hexavalent Chromium, and Cadmium Operations*, DTM 12-003, 18 April 2012).

The NGB Mid-West Regional IH Office has adopted the guidelines for metal dust published in NG Pam 420-15, *Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges* and the Department of Energy (DOE)/Brookhaven National Laboratory *Surface Wipe Sampling Procedure* (IH75190). Any results that exceed these guidelines shown in Table A-1 are considered significant. Three of the surface wipe sample results exceeded the guideline for cadmium.

Figure A-1. Facility Photos.

Recommendations:

1. Clean the horizontal surfaces of the facility using HEPA filter vacuum and/or wet methods. (RAC 2)

2. Continue to prohibit the presence of food and drink in work areas and stress the importance of hand washing prior to the consumption of food items. (RAC 3)

Table A-1
Surface Wipe Sampling Results for Toxic Metals
Indiana Army National Guard, Johnson County Armory Maintenance Bay
July 17, 2014

Sample #	Location	Photo	Lead (µg/ft^2)	Cadmium (µg/ft^2)	Chromium (µg/ft^2)
Surface Guideline			**200**	**28**	**6,970**
JCA-W1	Office on desk Room 1139		<91	<9.1	<91
JCA-W2	Maintenance bay on AED box		<91	**71**	<91
JCA-W3	Supply room on desk shelf Room 1138		<91	**61**	968
JCA-W4	Maintenance bay on paper towel holder		<91	**109**	139
JCA-W5	Blank	N/A	ND	ND	ND
JCA-W6	Blank	N/A	ND	ND	ND

Notes: 1) µg / ft^2 = micrograms per square foot of surface area. 2) N/A = not applicable. 3) ND = none detected. 4) "<" means less than the reporting limit for the analytical method. 5) **Bold text** indicates results at or above occupational exposure guidelines.

Laboratory Result Reports and Chain of Custody Sheets

FOH ENVIRONMENTAL LABORATORY
538 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

ANALYTICAL REPORT

Submitted To: USPHS / Federal Occupational Health
Denver Federal Center
Denver, CO 80225

Attention: Non-Responsive

Submitted By:

Reference Data: Lead, Cadmium and Chromium
Sampling Site: NGB: Franklin, IN (Johnson Co. Armory)
Sample Media: Ghost Wipe(s)®
Method Reference: OSHA ID-121
Project ID: Project 11920
DFOH Lab Nos.: TM-14-69603 through TM-14-69608
Date Received: 07/18/14
Data Analyzed: 07/21/14
Date Issued: 07/24/14

The wipe samples were hot plate digested. The samples were run on a Perkin Elmer 200 flame atomic absorption spectrophotometer (AA).

General Lab Comments:
All quality control criteria have been met.
* All samples received in condition acceptable for analysis unless otherwise noted.
** Sample results have not been corrected for contamination based on the field blank or other analytical blank unless otherwise noted.

Analytical results are given on the enclosed tables. Results relate only to items tested. If you have any questions about these results, feel free to phone the Laboratory at (312) 886-0413.

Non-Responsive

AIHA LAP, LLC
ACCREDITED LABORATORY

Project 11920
Page 1 of 3

FOH ENVIRONMENTAL LABORATORY
538 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

LEAD on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
JCA-W1	TM-14-69603	<10	<91
JCA-W2	TM-14-69604	<10	<91
JCA-W3	TM-14-69605	<10	<91
JCA-W4	TM-14-69606	<10	<91
JCA-W5	TM-14-69607	<10	
JCA-W6**	TM-14-69608	<10	

CADMIUM on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
JCA-W1	TM-14-69603	<1.0	<9.1
JCA-W2	TM-14-69604	7.8	71
JCA-W3	TM-14-69605	6.8	61
JCA-W4	TM-14-69606	12	109
JCA-W5	TM-14-69607	<1.0	
JCA-W6**	TM-14-69608	<1.0	

CHROMIUM on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
JCA-W1	TM-14-69603	<10	<91
JCA-W2	TM-14-69604	<10	<91
JCA-W3	TM-14-69605	197	968
JCA-W4	TM-14-69606	15	139
JCA-W5	TM-14-69607	<10	
JCA-W6**	TM-14-69608	<10	

Surface Wipe Sampling Criteria

Metal	Acceptable Surface Level µg/ft	Basis for Criteria
Cadmium	28	Brookhaven National Laboratory, Surface Wipe Sampling Procedure, Risk Assessment for Metals, IH75190 Rev 18 5/10/11
Chromium	6,970	Brookhaven National Laboratory, Surface Wipe Sampling Procedure, Risk Assessment for Metals, IH75190 Rev 18 5/10/11
Lead	250	EPA TSCA 40 CFR 745 and HUD Window Sills

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Project 11920
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Metals in Wipe Limits
(based on one ft^2 sampled area)

Analyte	Analytical Method	Method Detection Limit	Minimum Reporting Limit
Lead	OSHA ID-121	5.0 µg/ft^2	10 µg/ft^2
Cadmium	OSHA ID-121	0.5 µg/ft^2	1.0 µg/ft^2
Chromium	OSHA ID-121	5.0 µg/ft^2	10 µg/ft^2

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Project 11920
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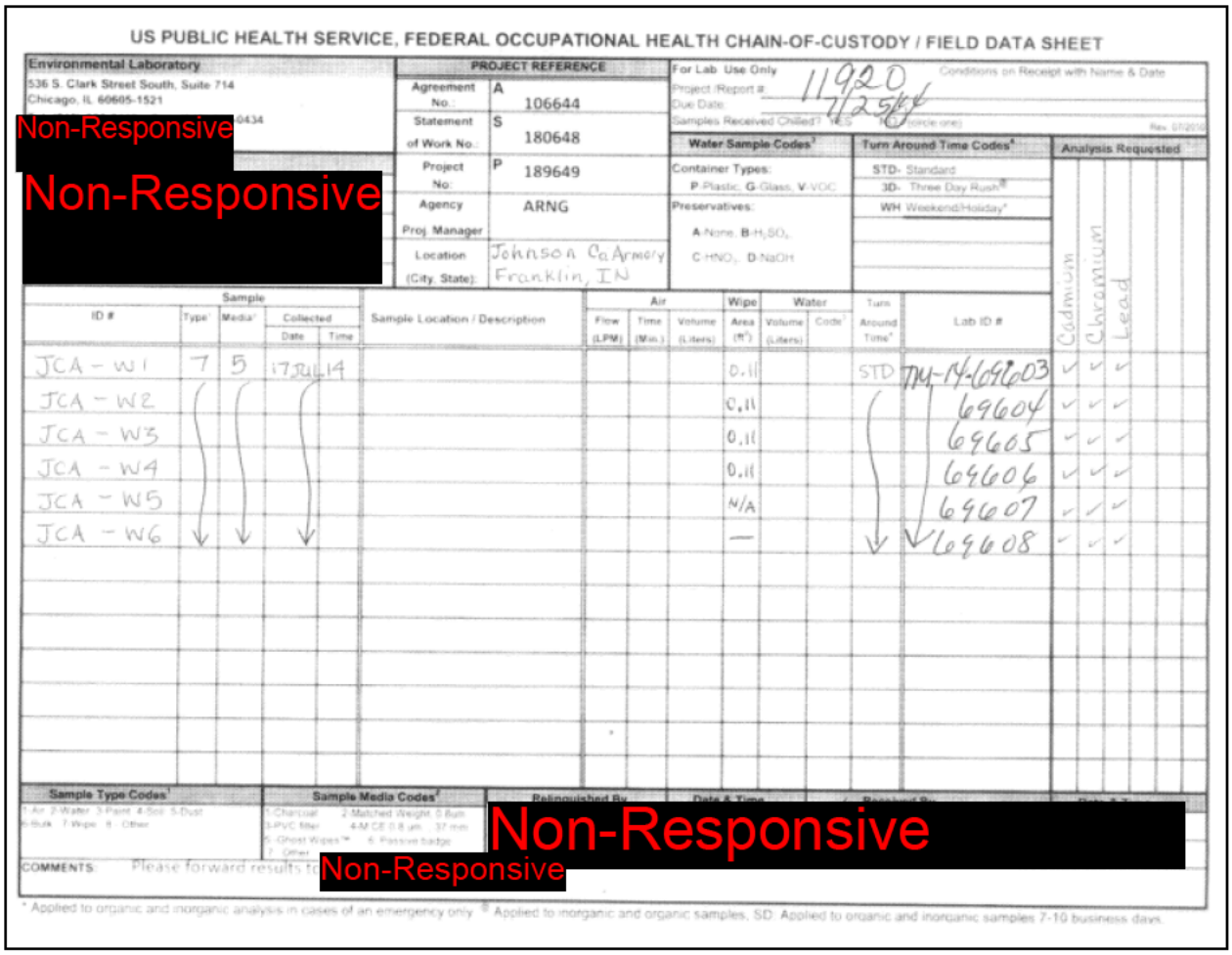


US PUBLIC HEALTH SERVICE, FEDERAL OCCUPATIONAL HEALTH CHAIN-OF-CUSTODY / FIELD DATA SHEET

Environmental Laboratory
536 S. Clark Street South, Suite 714
Chicago, IL 60605-1521
Non-Responsive
Non-Responsive

PROJECT REFERENCE

Agreement No.:	A 106644
Statement of Work No.:	S 180648
Project No:	P 189649
Agency	ARNG
Proj. Manager	
Location (City, State):	Johnson Co Armory Franklin, IN

For Lab Use Only
Project / Report #: 11920 / 12564
Due Date:
Samples Received Chilled? YES NO (circle one)
Conditions on Receipt with Name & Date
Rev. 07/2010

Water Sample Codes[3]
Container Types:
P-Plastic, G-Glass, V-VOC
Preservatives:
A-None, B-H_2SO_4
C-HNO_3, D-NaOH

Turn Around Time Codes[4]
STD- Standard
3D- Three Day Rush[5]
WH- Weekend/Holiday*

Analysis Requested: Cadmium, Chromium, Lead

Sample ID #	Type[1]	Media[2]	Collected Date	Collected Time	Sample Location / Description	Air Flow (LPM)	Air Time (Min.)	Air Volume (Liters)	Wipe Area (ft^2)	Water Volume (Liters)	Water Code[3]	Turn Around Time[4]	Lab ID #	Cadmium	Chromium	Lead
JCA - W1	7	5	17JUL14						0.11			STD	TM-14-69603	✓	✓	✓
JCA - W2	↓	↓	↓						0.11			↓	69604	✓	✓	✓
JCA - W3									0.11				69605	✓	✓	✓
JCA - W4									0.11				69606	✓	✓	✓
JCA - W5									N/A				69607	✓	✓	✓
JCA - W6									—				69608	✓	✓	✓

Sample Type Codes[1]
1-Air, 2-Water, 3-Paint, 4-Soil, 5-Dust, 6-Bulk, 7-Wipe, 8-Other

Sample Media Codes[2]
1-Charcoal, 2-Matched Weight, 3-Bulk, 4-PVC filter, 4-M CE 0.8 µm, 37 mm, 5-Ghost Wipes™, 6-Passive badge, 7-Other

Relinquished By | Date & Time | Received By

Non-Responsive
Non-Responsive

COMMENTS: Please forward results to

* Applied to organic and inorganic analysis in cases of an emergency only. [5] Applied to inorganic and organic samples. SD: Applied to organic and inorganic samples 7-10 business days.

Appendix D
Ventilation

A TSI Alnor Model AVM430A thermal anemometer calibrated according to the manufacturer's specifications was used to evaluate exhaust ventilation systems at this facility. Ventilation rates were compared to criteria established by the American Conference of Governmental Industrial Hygienists (ACGIH) *Industrial Ventilation, A Manual of Recommended Practice for Design, NGB Design Guide 415-2 for Logistics Facilities,* and the Occupational Safety and Health Administration (OSHA).

Tailpipe Exhaust System

The facility is equipped with four overhead tailpipe exhaust drops each serviced by a dedicated exhaust fan (Figure D-1). The systems were not operational and were not tested. This facility is only used on a part-time basis for drill weekends and the available staff did not know how to operate the tailpipe exhaust systems. The tailpipe exhaust drops were designed to provide an airflow rate of 1400 cubic feet per minute (cfm) which meets the minimum airflow rate of 800 cfm required by the NGB Mid-West Regional IH Office IAW and the ACGIH formulae for tailpipe exhaust ventilation volumes (VS-85-2).

Figure D-1. Tailpipe Exhaust System.

Figure D-2. Battery Room.

Carbon Monoxide Gas Detection System

Carbon monoxide is an odorless, colorless toxic gas that is a product of incomplete combustion. Maintenance activities require personnel to run engines while they are in the shop. The shop is equipped with a Toxalert carbon monoxide gas detection system. Calibration information was not available.

Battery and Hazardous Materials Storage Room

The maintenance bay design includes a battery room (Figure D-2) and a hazardous materials storage room. These rooms are used for storage of equipment and supplies and are not currently used for their designed purpose.

Recommendations:

1. Ensure the carbon monoxide detection system is calibrated according to the manufacturer's instructions. (RAC 2)

2. Determine how to operate the tailpipe exhaust systems and schedule ventilation testing with industrial hygiene personnel. (RAC 2)

3. If the battery or the hazardous materials storage rooms are ever used for their intended purpose, schedule ventilation testing with industrial hygiene personnel. (RAC 4)

Appendix E
Lighting

Illumination levels were measured with an Extech Instruments Model 407026 light meter calibrated according to the manufacturer's specifications. The results were compared with the recommendations in the National Guard Bureau Facility Design Guides and the American National Standards Institute/Illuminating Engineering Society of North America RP-1 (Offices) and RP-7 (Industrial Facilities) guidelines. The results and the lighting criteria are contained in Table E-1. Illumination levels were only partially met in the maintenance bays and the tool room.

Recommendations:

1. Increase the illumination levels in the maintenance bays and tool room or provide supplemental lighting. (RAC 4)

Table E-1
Lighting Measurements
Indiana Army National Guard, Johnson County Armory Maintenance Bay
July 17, 2014

Room No.	Locations	Measured Illumination (foot candles)	Requirement (foot candles)	Standard Met?
1132	Tool Room	23-33	30	Partially
1136-7	Bays 1 & 4*	41-50	50	Partially
1136-7	Bay Center*	59-67	50	Yes
1136-7	Bays 2 & 3*	45-63	50	Partially
1138	Supply	39-44	30	Yes
1139	Office**	37-40	50	No
1140	Storage (Battery)	31-34	30	Yes
1142	Custodial	31-33	30	Yes
1143	Male Latrine	74-81	30	Yes
1144	Female Latrine	48-53	30	Yes
1148	Storage (HazMat)	31-34	30	Yes

* = overhead doors closed. ** = one fixture was not operating.

National Guard Bureau
Mid-West Regional Industrial Hygiene Office
301-IH Old Bay Lane
Havre de Grace, MD 21078

ARNG-CSG-P August 8, 2014

MEMORANDUM FOR: The Adjutant General for Indiana

SUBJECT: Industrial Hygiene Survey at Lawrence Armory Maintenance Training Bay, Lawrence, Indiana

National Guard Bureau (NGB) Mid-West Regional Industrial Hygiene (IH) Office field personnel conducted a survey on June 26, 2014 at the Indiana Army National Guard Lawrence Armory Maintenance Bay, located at 9920 East 59th Street, Lawrence, Indiana. The site point of contact was Non-Responsive . This IH survey included a walkthrough of the facility and surface wipe sampling for heavy metals. In addition, the local exhaust ventilation systems and illumination levels were tested.

Occupational health risk assessment codes (RACs) are assigned to quantify health risks to personnel IAW DOD Letter of Instruction 6055.1, *DOD Safety and Occupational Health Program*. Risk assessment is an expression of health hazard severity and mishap probability, described in terms of route of exposure, actual exposure, exposure limit standards, potential health effects, duration of exposure, and number of exposed personnel. Guidance for RAC determination is attached to this memorandum.

Surface Wipe Sampling: Wipe samples were collected on representative surfaces in the facility and analyzed for toxic metals (lead, cadmium, and chromium). For purposes of this report, any results that exceed the guidelines adopted by the NGB Mid-West Regional IH Office are considered significant. None of the surface wipe sample results exceeded guidelines. The following actions are required:

- Continue to clean the horizontal surfaces of the facility using high-efficiency particulate air (HEPA) filter vacuum and/or wet methods. (RAC 3)

- Continue to prohibit the presence of food and drink in work areas and stress the importance of hand washing prior to the consumption of food items. (RAC 3)

Ventilation: Exhaust ventilation surveys were conducted for the tailpipe exhaust system and the controlled waste storage, flammable storage, and battery rooms. All systems met requirements. The shop was not equipped with a carbon monoxide/nitrogen dioxide gas detection system. This facility is only used on a part-time basis for drill weekends. Housekeeping in the battery room and controlled waste storage area was lacking. The following actions are required:

- Install an industrial carbon monoxide/nitrogen dioxide detection system in the maintenance bay IAW NGB DG 415-2. Ensure the detection system is installed and calibrated according to the manufacturer's instructions. (RAC 2)

- Routine housekeeping measures should be instituted in the battery room and controlled waste storage area. (RAC 3)

Lighting: Facility lighting was evaluated during this survey. Illumination levels were only partially met in the maintenance bays and production control area. The following actions are required:

- Increase the illumination levels in the maintenance bays and production control area or provide supplemental lighting. (RAC 4)

The NGB conducted this survey in the interest of preventing employee illness and to meet legal obligations where applicable. Results and recommendations are based on information provided by site personnel, field measurements, and conditions observed during the survey. Any change in processes, work practices, or materials requires additional sampling to characterize employee exposures. For any further questions, please contact Mr. Non-Responsive

[redacted]

[redacted]

Non-Responsive

[redacted]

Regional Industrial Hygienist

Appendix	Title	Status
A.	Metals.....	Attached
B.	Organic Vapors.....	N/A
C.	Noise.....	N/A
D.	Ventilation.....	Attached
E.	Lighting.....	Attached

Occupational Health Risk Assessment Codes
(Reference: DOD Letter of Instructions 6055.1)

Occupational health risk assessment codes (RACs) are included in this report to quantify health risks to personnel. Risk assessment is an expression of health hazard severity and mishap probability, described in terms of route of exposure, actual exposure, exposure limit standards, potential health effects, duration of exposure, and number of exposed personnel. The following procedure is used to determine the RACs:

STEP 1: This step assesses points to determine the health hazard severity category (HHSC). The HHSC reflects the magnitude of exposure to a physical, chemical, or biological agent and the medical effects of exposure.

A. Exposure Points Assessed.

Alternate Route of Exposure			Exposure Conditions			
			<CT	Occasionally >CT Always ≤STD	>CT <STD	>STD
AER	Possible	NO	0	3	5	7
		YES	1-2	4	6	8

Notes:

1) AER = Alternate exposure route, such as skin absorption or ingestion.
2) CT = DoD component threshold that triggers surveillance actions, such as action level.
3) STD = DoD exposure limit, such as TLV or PEL.
4) > = Greater than. 5) < = Less than.
6) ≤ = Less than or equal to.

B. Medical Effects Points Assessed.

Condition	Points
No medical effects, such as nuisance noise and nuisance odor	0
Temporary reversible illness requiring supportive treatment, such as eye irritation and sore throat	1-2
Temporary reversible illness with a variable but limited period of disability, such as metal fume fever	3-4
Permanent, nonsevere illness or loss of capacity, such as permanent hearing loss	5-6
Permanent, severe, disabling, irreversible illness or death, such as asbestosis or lung cancer	7-8

C. The HHSC is determined by totaling the points assessed and using the following guide:

Total Points*	HHSC
13-16	I
9-12	II
5-8	III
0-4	IV

* Sum of A and B above.

STEP 2: This step uses the following guidelines to assess points to determine the mishap probability category (MPC) for health hazards. The probability of mishap reflects the duration of exposure and the number of exposed personnel.

A. Duration of Exposure Points Assessed.

Type of Exposure	Length of Exposure		
	1-8 hr/wk	>8 hr/wk/not continuous	Continuous
Irregular/ Intermittent	1-2	4-6	NA
Regular/Periodic	2-3	5-7	8

B. Number of Exposed personnel Points Assessed.

Number of Exposed Personnel	Points
<5	1-2
5-9	3-4
10-49	5-6
>49	7-8

C. The MPC for health hazards is determined by totaling the points assessed and using the following guide:

Total Points*	MPC
14-16	A
10-13	B
5-9	C
<5	D

* Sum of A and B above.

STEP 3: The RAC is determined using the following matrix:

HHSC	MPC			
	A	B	C	D
I	1	1	2	3
II	1	2	3	4
III	2	3	4	5
V	3	4	5	5

Appendix A
Metals

Surface Wipe Sampling

Wipe samples were collected from representative areas of the facility (Figure A-1) using Environmental Express Ghost™ Wipes and templates IAW the OSHA wipe sampling method (OSHA Technical Manual, Appendix II, 2-1). In addition, surface wipe samples were collected in the break room to assess migration of toxic metals into food handling spaces. The samples were analyzed for toxic metals by OSHA Method ID-121. The results and photos are contained in Table A-1.

Although OSHA does not have published exposure standards for metal surface contamination, 29 CFR 1910 requires that all surfaces must be kept as free as practicable of accumulations of toxic metal dusts. In addition, DOD has instituted a policy to minimize surface contamination levels of heavy metals (*Control and Management of Surface Accumulations from Lead, Hexavalent Chromium, and Cadmium Operations*, DTM 12-003, 18 April 2012).

The NGB Mid-West Regional IH Office has adopted the guidelines for metal dust published in NG Pam 420-15, *Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges* and the Department of Energy (DOE)/Brookhaven National Laboratory *Surface Wipe Sampling Procedure* (IH75190). Any results that exceed these guidelines shown in Table A-1 are considered significant. None of the surface wipe sample results exceeded the guidelines.

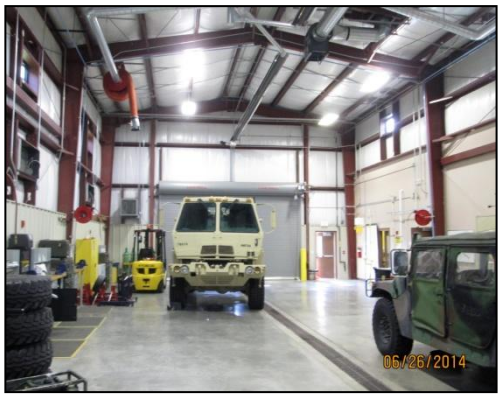


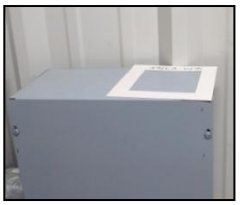
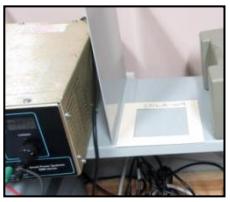
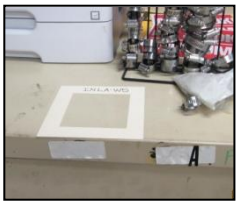
Figure A-1. Facility Photos.

Recommendations:

1. Continue to clean the horizontal surfaces of the facility using HEPA filter vacuum and/or wet methods. (RAC 3)

2. Continue to prohibit the presence of food and drink in work areas and stress the importance of hand washing prior to the consumption of food items. (RAC 3)

Table A-1
Surface Wipe Sampling Results for Toxic Metals
Indiana Army National Guard, Lawrence Armory
June 26, 2014

Sample #	Location	Photo	Lead ($\mu g/ft^2$)	Cadmium ($\mu g/ft^2$)	Chromium ($\mu g/ft^2$)
Surface Guideline			**200**	**28**	**6,970**
INLA-W1	Controlled waste storage on flammable cabinet		<91	<9.1	<91
INLA-W2	Break room on refrigerator		<91	<9.1	<91
INLA-W3	Production control office on electrical box		<91	<9.1	<91
INLA-W4	Battery room on file cabinet A		<91	<9.1	<91
INLA-W5	Maintenance bay at workstation		<91	<9.1	<91
INLA-W6	Blank	N/A	ND	ND	ND

Notes: 1) µg / ft^2 = micrograms per square foot of surface area. 2) N/A = not applicable. 3) ND = none detected. 4) "<" means less than the reporting limit for the analytical method.

Laboratory Result Reports and Chain of Custody Sheets

FOH ENVIRONMENTAL LABORATORY

538 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

ANALYTICAL REPORT

Submitted To: USPHS / Federal Occupational Health
Denver Federal Center
Denver, CO 80225

Attention: Non-Responsive

Submitted By:

Reference Data: Lead, Cadmium and Chromium
Sampling Site: NGB: Lawrence, IN (Armory)
Sample Media: Ghost Wipe(s)®
Method Reference: OSHA ID-121
Project ID: Project 11868
DFOH Lab Nos.: TM-14-68772 through TM-14-68778
Date Received: 06/27/14
Data Analyzed: 06/27/14 – 06/30/14
Date Issued: 07/01/14

The wipe samples were hot plate digested. The samples were run on a Perkin Elmer 200 flame atomic absorption spectrophotometer (AA).

General Lab Comments:
All quality control criteria have been met.
* All samples received in condition acceptable for analysis unless otherwise noted.
** Sample results have not been corrected for contamination based on the field blank or other analytical blank unless otherwise noted.

Analytical results are given on the enclosed tables. Results relate only to items tested. If you have any questions about these results, feel free to phone the Laboratory at (312) 886-0413.

Non-Responsive

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FOH ENVIRONMENTAL LABORATORY
538 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

LEAD on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
INLA-W1	TM-14-68772	<10	<91
INLA-W2	TM-14-68773	<10	<91
INLA-W3	TM-14-68774	<10	<91
INLA-W4	TM-14-68775	<10	<91
INLA-W5	TM-14-68776	<10	<91
INLA-W6	TM-14-68777	<10	<91
INLA-W7**	TM-14-68778	<10	

CADMIUM on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
INLA-W1	TM-14-68772	<1.0	<9.1
INLA-W2	TM-14-68773	<1.0	<9.1
INLA-W3	TM-14-68774	<1.0	<9.1
INLA-W4	TM-14-68775	<1.0	<9.1
INLA-W5	TM-14-68776	<1.0	<9.1
INLA-W6	TM-14-68777	<1.0	<9.1
INLA-W7**	TM-14-68778	<1.0	

CHROMIUM on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
INLA-W1	TM-14-68772	<10	<91
INLA-W2	TM-14-68773	<10	<91
INLA-W3	TM-14-68774	<10	<91
INLA-W4	TM-14-68775	<10	<91
INLA-W5	TM-14-68776	<10	<91
INLA-W6	TM-14-68777	<10	<91
INLA-W7**	TM-14-68778	<10	

Surface Wipe Sampling Criteria

Metal	Acceptable Surface Level µg/ft	Basis for Criteria
Cadmium	28	Brookhaven National Laboratory, Surface Wipe Sampling Procedure, Risk Assessment for Metals, IH75190 Rev 18 5/10/11
Chromium	6,970	Brookhaven National Laboratory, Surface Wipe Sampling Procedure, Risk Assessment for Metals, IH75190 Rev 18 5/10/11
Lead	250	EPA TSCA 40 CFR 745 and HUD Window Sills

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Project 11868
Page 2 of 3

FOH ENVIRONMENTAL LABORATORY
538 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

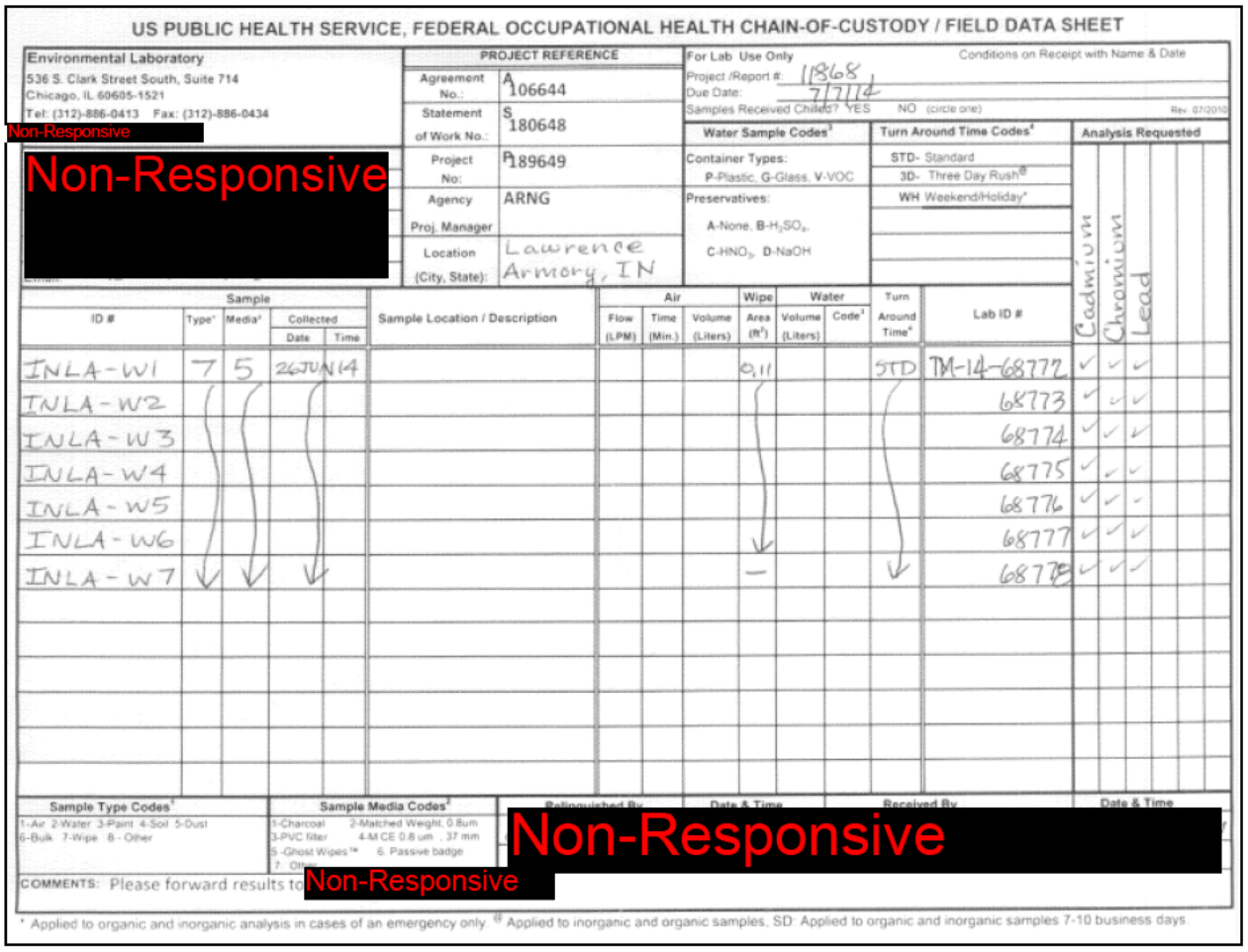
Metals in Wipe Limits
(based on one ft^2 sampled area)

Analyte	Analytical Method	Method Detection Limit	Minimum Reporting Limit
Lead	OSHA ID-121	5.0 $\mu g/ft^2$	10 $\mu g/ft^2$
Cadmium	OSHA ID-121	0.5 $\mu g/ft^2$	1.0 $\mu g/ft^2$
Chromium	OSHA ID-121	5.0 $\mu g/ft^2$	10 $\mu g/ft^2$

Non-Responsive

AIHA LAP, LLC
ACCREDITED LABORATORY

Project 11868
Page 3 of 3



US PUBLIC HEALTH SERVICE, FEDERAL OCCUPATIONAL HEALTH CHAIN-OF-CUSTODY / FIELD DATA SHEET

Environmental Laboratory
536 S. Clark Street South, Suite 714
Chicago, IL 60605-1521
Tel: (312)-886-0413 Fax: (312)-886-0434

Non-Responsive

Non-Responsive

PROJECT REFERENCE
Agreement No.: A 106644
Statement of Work No.: S 180648
Project No: P189649
Agency: ARNG
Proj. Manager:
Location (City, State): Lawrence Armory, IN

For Lab Use Only
Project /Report #: 18368
Due Date: 7/7/14
Samples Received Chilled? YES NO (circle one)

Conditions on Receipt with Name & Date

Rev. 07/2010

Water Sample Codes[3]
Container Types: P-Plastic, G-Glass, V-VOC
Preservatives: A-None, B-H_2SO_4, C-HNO_3, D-NaOH

Turn Around Time Codes[4]
STD- Standard
3D- Three Day Rush[@]
WH Weekend/Holiday*

Analysis Requested: Cadmium, Chromium, Lead

Sample ID #	Type[1]	Media[2]	Collected Date	Collected Time	Sample Location / Description	Air Flow (LPM)	Air Time (Min.)	Air Volume (Liters)	Wipe Area (ft^2)	Water Volume (Liters)	Water Code[3]	Turn Around Time[4]	Lab ID #	Cadmium	Chromium	Lead
INLA-W1	7	5	26JUN14						0.11			STD	TM-14-68772	✓	✓	✓
INLA-W2													68773	✓	✓	✓
INLA-W3													68774	✓	✓	✓
INLA-W4													68775	✓	✓	✓
INLA-W5													68776	✓	✓	-
INLA-W6													68777	✓	✓	✓
INLA-W7									—				68778	✓	✓	✓

Sample Type Codes[1]
1-Air 2-Water 3-Paint 4-Soil 5-Dust
6-Bulk 7-Wipe 8 - Other

Sample Media Codes[2]
1-Charcoal 2-Matched Weight, 0.8um
3-PVC filter 4-M CE 0.8 um , 37 mm
5 -Ghost Wipes™ 6. Passive badge
7 - Other

Relinquished By | Date & Time | Received By | Date & Time

Non-Responsive

COMMENTS: Please forward results to Non-Responsive

* Applied to organic and inorganic analysis in cases of an emergency only. @ Applied to inorganic and organic samples. SD: Applied to organic and inorganic samples 7-10 business days

Appendix D
Ventilation

A TSI Alnor Model AVM430A thermal anemometer calibrated according to the manufacturer's specifications was used to evaluate exhaust ventilation systems at this facility. Ventilation rates were compared to criteria established by the American Conference of Governmental Industrial Hygienists (ACGIH) *Industrial Ventilation, A Manual of Recommended Practice for Design, NGB Design Guide 415-2 for Logistics Facilities,* and the Occupational Safety and Health Administration (OSHA).

Tailpipe Exhaust System

The facility is equipped with two overhead tailpipe exhaust drops serviced by a single exhaust fan (Figure D-1). Velocity measurements were collected at the face of each exhaust fitting. The airflow rates for the tailpipe exhaust drops are presented in Table D-1. The tailpipe exhaust drops met the minimum airflow rate of 800 cubic feet per minute (cfm) required by the NGB Mid-West Regional IH Office IAW and the ACGIH formulae for tailpipe exhaust ventilation volumes (VS-85-2).

Figure D-1. Tailpipe Exhaust System.

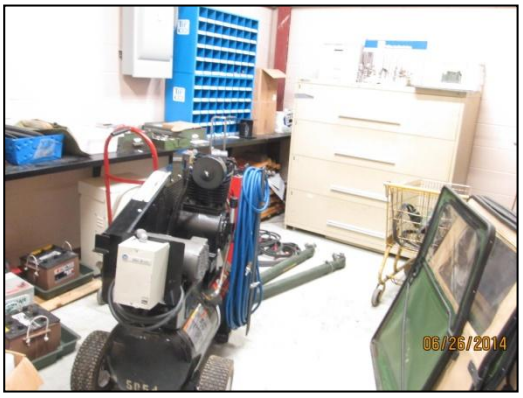


Figure D-2. Battery Room.

Carbon Monoxide Gas Detection System

Carbon monoxide is an odorless, colorless toxic gas that is a product of incomplete combustion. Maintenance activities require personnel to run engines while they are in the shop. The shop was not equipped with a carbon monoxide/nitrogen dioxide gas detection system.

Other Exhaust Ventilation Systems

The exhaust ventilation systems in the controlled waste storage, flammable storage, and battery rooms were evaluated and met applicable standards (Table D-2). This facility is only used on a part-time basis for drill weekends. Housekeeping in the battery room (Figure D-2) and controlled waste storage area was lacking.

Recommendations:

1. Install an industrial carbon monoxide/nitrogen dioxide detection system in the maintenance bay IAW NGB DG 415-2. Ensure the detection system is installed and calibrated according to the manufacturer's instructions. (RAC 2)

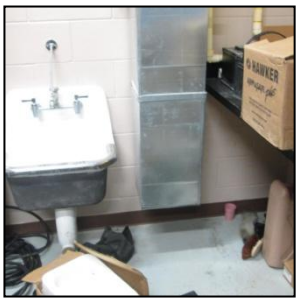
2. Routine housekeeping measures should be instituted to ensure equipment and supplies are stored properly, especially in the battery room and controlled waste storage area. (RAC 3)

Table D-1
Tailpipe Exhaust System Ventilation Measurements
Indiana Army National Guard, Lawrence Armory
June 26, 2014

Exhaust Location	Diameter (inches)	Exhaust Airflow Rate (cfm)	Requirement (cfm)	Standard Met?
Bay 1 (North)	10	939	800	Yes
Bay 2 (South)	10	1142	800	Yes

Notes: 1) cfm = cubic feet per minute.

Table D-2
Exhaust Ventilation Measurements
Indiana Army National Guard, Lawrence Armory
June 26, 2014

Location	Controlled Waste	Flammable Storage	Battery Room
Photo			
Exhaust Vent Dimensions	16” x 16”	24” x 24”	9” x 9”
Exhaust Vent Area (ft^2)	1.78	4.0	0.56
Room Dimensions (L x W x H)	19’ x 16’ x 13’	19’ x 13’ x 13’	16’ x 13’ x 11’
Exhaust Airflow Rate (cfm)	316	512	497
Result	4.8 ACH	9.6 ACH	2.4 cfm/ft^2
Requirement	4 ACH (DG 415-2)	6 ACH (OSHA)	2.0 cfm/ft^2 (NGB DG 415-2)
Standard Met?	Yes	Yes	Yes

Notes: 1) cfm = cubic feet per minute. 2) ACH = air changes per hour.

Appendix E
Lighting

Illumination levels were measured with an Extech Instruments Model 407026 light meter calibrated according to the manufacturer's specifications. The results were compared with the recommendations in the National Guard Bureau Facility Design Guides and the American National Standards Institute/Illuminating Engineering Society of North America RP-1 (Offices) and RP-7 (Industrial Facilities) guidelines. The results and the lighting criteria are contained in Table E-1. Illumination levels were only partially met in the maintenance bays and production control area.

Recommendations:

1. Increase the illumination levels in the maintenance bays and production control area or provide supplemental lighting. (RAC 4)

Table E-1
Lighting Measurements
Indiana Army National Guard, Lawrence Armory Maintenance Bay
June 26, 2014

Locations	Measured Illumination (foot candles)	Requirement (foot candles)	Standard Met?
Break Room	75-79	30	Yes
Latrine	35-40	30	Yes
Tool Room	49-52	30	Yes
Controlled Waste	31-34	30	Yes
Flammable Storage	42-46	30	Yes
Supervisor's Office	68-93	50	Yes
Production Control	39-56	50	Partially
Battery Room	56-59	50	Yes
Bay 1 (North)	33-53	50	Partially
Bay 2 (South)	43-53	50	Partially

Lead Sampling Report

State: Indiana	**Facility:** Tyndal Armory	**Address:** 711 N. Pennsylvania, Indianapolis, IN46204
Date: Feb 24, 2015	**CIH:** Non-Responsive	**POCs:** Non-Responsive [redacted]

Facility Description: Built in 1926, the armory is a four-story structure with a drill hall, kitchen, weapons vault, classroom, offices, Family Assistance office, latrines, and supply storage. The former indoor firing range in the basement was converted to offices, storage room, cage storage, and training room (Governors Hall). The basement had also been used as a vehicle garage. It was also reported that the Drill Room was used at times for target practice. The public does have access to the Drill Room, Kitchen, and Family Assistance office.

Community Use/Children	Y	**Description:** The facility is used for public events that include children.
Weapons Cleaning	Y	**Locations:** Drill room floor.

Summary: The focus of this sampling effort was to conduct a baseline lead dust survey of the armory. Table 1 contains the sampling results for 30 samples and the sampling locations.

The surface wipe sample result for the window sill in Jim Mahern's office was 295 µg/ft^2 . This level was above the NG Pam 420-15 guideline for lead of 200 µg/ft^2. A sample collected on a window sill in an adjacent office, room 200A was 544 µg/ft^2 . The lead containing dust on the sills may be caused by chipping paint from the leaden windows. Seven samples were collected in the Drill room. Three samples had elevated levels of lead. In the basement two samples collected on the floor on the north end of the basement contained 11,500 and 12,500 µg/ft^2 . All other sample results were below the analytical laboratory reporting limit.

Recommendations:

- Increase housekeeping in the offices especially on the window sills and all surfaces in the drill room. Use a high efficiency particulate air (HEPA) filter vacuum or wet methods to clean these surfaces. (RAC 2)
- The rooms in the basement with high levels of surface containing lead should be closed to unauthorized personnel and signs posted of potential lead exposure hazard. (RAC 2)
- Areas of the basement with high surface lead levels should be decontaminated by individuals trained in lead abatement in accordance with the *Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges* NG PAM 420-15. (RAC 2)
- The armory housekeeping staff should also be trained in the hazards of lead exposure and also follow the guidelines in NG PAM 420-15. (RAC 2)
- Weapons cleaning should be performed in an area not open to the public. (RAC 2)
- A follow-up survey should be conducted after a complete cleaning of surfaces in the occupied rooms to test for the presence of lead on surfaces. (RAC 3)

Lead Sampling Report

Table 1. Surface Wipe Sampling Results for Lead.

Sample No. Location	Photo	Lead Results ($\mu g/ft^2$)	Guideline ($\mu g/ft^2$)	Above Guideline ?
W-1 On desk in [redacted] office		<10	200	No
W-2 Top of book case in [redacted] office		<10	200	No
W-3 Window sill in [redacted] office		**295**	200	Yes

Lead Sampling Report

Sample No. Location	Photo	Lead Results (µg/ft^2)	Guideline (µg/ft^2)	Above Guideline ?
W-4 On heater in Non-Resp [redacted] office		<10	200	No
W-5 On book case in office area outside Non-Resp [redacted] office		<10	200	No
W-6 On floor in lobby on the 2nd floor		<10	200	No
W-7 On floor in the Drill room		<10	200	No

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Sample No. Location	Photo	Lead Results (µg/ft^2)	Guideline (µg/ft^2)	Above Guideline ?
W-8 Window sill in room 200A		**544**	200	Yes
W-9 On table in the Drill room		<10	40	No
W-10 On blue bleachers in Drill room		<10	40	No
W-11 On window sill in Drill room		**103**	40	Yes

Sample No. Location	Photo	Lead Results (µg/ft^2)	Guideline (µg/ft^2)	Above Guideline ?
W-12 On upper ledge on grill in the Drill room		**417**	40	Yes
W-13 On upper balcony ledge in the Drill room		<10	40	No
W-14 On children's table in Family Assistance		<10	40	No
W-15 On rubber floor mats in Family Assistance		<10	40	No

Sample No. Location	Photo	Lead Results (µg/ft^2)	Guideline (µg/ft^2)	Above Guideline ?
W-16 On desk in Family Assistance		<10	40	No
W-17 On ice machine in Kitchen		<10	40	No
W-18 On counter in Kitchen		<10	40	No
W-19 On soda machine in Dining Hall		<10	40	No

Sample No. Location	Photo	Lead Results (µg/ft^2)	Guideline (µg/ft^2)	Above Guideline ?
W-20 Eating table in Dining Hall		<10	40	No
W-21 On table in Dining Hall		<10	40	No
W-22 On top of ceiling tile in basement Governor's Hall – south		94	200	No
W-23 On floor in basement Governor's Hall		<91	200	No

Sample No. Location	Photo	Lead Results (µg/ft^2)	Guideline (µg/ft^2)	Above Guideline ?
W-24 On pipe in basement Governor's Hall		**834**	200	Yes
W-25 On cement floor in basement, north end		**11,500**	200	Yes
W-26 On cement floor in basement, north-east end		**12,500**	200	Yes
W-27 On floor in basement in storage cage area		<91	200	No

Sample No. Location	Photo	Lead Results (µg/ft^2)	Guideline (µg/ft^2)	Above Guideline ?
W-28 On flammable cabinet in basement		<91	200	No
W-29 On floor outside vault		<91	200	No
W-30 On basket ball support in Drill room		**474**	40	Yes
W-31 Blank		ND	-	-
W-32 Blank		ND	-	-

Sample No. Location	Photo	Lead Results (µg/ft^2)	Guideline (µg/ft^2)	Above Guideline ?
W-33 blank		ND	-	-

Notes:

1) µg/ft^2 = micrograms per square foot of surface area.

2) "<" means less than the reporting limit for the analytical method.

3) NG Pam 420-15 Guidelines: 200 µg/ft^2 for old range and facility; 40 µg/ft^2 for potentially child occupied areas of facility. NG Pam 420-15, *Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges*, 3 November 2006.

4) Samples NEW-W1 through NEW-W22 were collected in and around the old range and are discussed separately in the Newark Armory IFR lead sampling report.

5) Blank sample results (NEW-W34 through NEW-W36) were less than the analytical detection limit.

Sample location room for W-26 12,500 µg/ft^2

Sample location room for W-25 11,500 µg/ft^2

Sample location room for W-24 834 µg/ft^2

Laboratory Result Reports and Chain of Custody Sheets.

Lead Sampling Report

FOH ENVIRONMENTAL LABORATORY
536 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

ANALYTICAL REPORT

Submitted To: USPHS / Federal Occupational Health
Denver Federal Center
Denver, CO 80225

Attention: Non-Responsive

Submitted By:

Reference Data: Lead

Sampling Site:	NGB: Indianapolis, IN (Tyndal Armory)
Sample Media:	Ghost Wipe(s)®
Method Reference:	OSHA ID-121
Project ID:	Project 12688
DFOH Lab Nos.:	TM-15-78885 through TM-15-78917
Date Received:	02/26/15
Data Analyzed:	02/26/15
Date Issued:	02/26/15

The wipe samples were hot plate digested. The samples were run on a Perkin Elmer 200 flame atomic absorption spectrophotometer (AA).

General Lab Comments:
All quality control criteria have been met.
* All samples received in condition acceptable for analysis unless otherwise noted.
** Sample results have not been corrected for contamination based on the field blank or other analytical blank unless otherwise noted.

Analytical results are given on the enclosed tables. Results relate only to items tested. If you have any questions about these results, feel free to phone the Laboratory at (312) 886-0413.

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FOH ENVIRONMENTAL LABORATORY
536 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

LEAD on WIPE RESULTS

SAMPLE NUMBER*	LABORATORY NUMBER	CONCENTRATION (µg)	CONCENTRATION (µg/ft²)
W-1	TM-15-78885	<10	<10
W-2	TM-15-78886	<10	<10
W-3	TM-15-78887	33	295
W-4	TM-15-78888	<10	<91
W-5	TM-15-78889	<10	<10
W-6	TM-15-78890	<10	<10
W-7	TM-15-78891	<10	<10
W-8	TM-15-78892	60	544
W-9	TM-15-78893	<10	<10
W-10	TM-15-78894	<10	<10
W-11	TM-15-78895	103	103
W-12	TM-15-78896	417	417
W-13	TM-15-78897	<10	<10
W-14	TM-15-78898	<10	<10
W-15	TM-15-78899	<10	<10
W-16	TM-15-78900	<10	<10
W-17	TM-15-78901	<10	<10
W-18	TM-15-78902	<10	<10
W-19	TM-15-78903	<10	<10
W-20	TM-15-78904	<10	<10
W-21	TM-15-78905	<10	<10
W-22	TM-15-78906	10	94
W-23	TM-15-78907	<10	<91
W-24	TM-15-78908	92	834
W-25	TM-15-78909	1265	11500
W-26	TM-15-78910	1375	12500
W-27	TM-15-78911	<10	<91
W-28	TM-15-78912	<10	<91
W-29	TM-15-78913	<10	<91
W-30	TM-15-78914	52	474
W-31	TM-15-78915	<10	<91
Blank**	TM-15-78916	<10	
Blank**	TM-15-78917	<10	

Surface Wipe Sampling Criteria

Metal	Acceptable Surface Level µg/ft²	Basis for Criteria
Lead	200 for facilities (all surfaces)	NG Pam 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 November 2006, http://www.ngbpdc.ngb.army.mil/pubs/420/ngpam420_15.pdf
Lead	40 for any potentially child occupied areas of facility (all surfaces); used for armories with public access, family services offices, or other routine use by children	NG Pam 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 November 2006, http://www.ngbpdc.ngb.army.mil/pubs/420/ngpam420_15.pdf

Lead Sampling Report

FOH ENVIRONMENTAL LABORATORY
536 S. CLARK STREET CHICAGO, IL 60605 PHONE: (312) 886-0413 FAX: (312) 886-0434

Metals in Wipe Limits
(based on one ft^2 sampled area)

Analyte	Analytical Method	Method Detection Limit	Minimum Reporting Limit
Lead – Flame AA	OSHA ID-121	5.0 $\mu g/ft^2$	10 $\mu g/ft^2$

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Lead Sampling Report

US PUBLIC HEALTH SERVICE, FEDERAL OCCUPATIONAL HEALTH CHAIN-OF-CUSTODY / FIELD DATA SHEET Pg 1 of 3

Environmental Laboratory
536 S. Clark Street South, Suite 714
Chicago, IL 60605-1521
Tel: (312) 886-0413 Fax: (312) 886-0434

Non-Responsive

Contact Information

Non-Responsive

PROJECT REFERENCE

Agreement No.:	A	106644
Statement of Work No.:	S	180648
Project No:	P	180649
Agency		ARNG
Proj. Manager		Tyndal Armory
Location (City, State):		Indianapolis IN

For Lab Use Only
Project /Report #: 12688
Due Date: 3/2/15
Samples Received Chilled? YES NO (circle one)

Conditions on Receipt with Name & Date

Rev. 07/2010

Water Sample Codes*

Container Types:
P-Plastic, G-Glass, V-VOC

Preservatives:
A-None, B-H_2SO_4, C-HNO_3, D-NaOH

Turn Around Time Codes*
STD- Standard
3D- Three Day Rush[@]
WH Weekend/Holiday*

Analysis Requested: Lead

Sample ID #	Type[1]	Media[2]	Collected Date	Collected Time	Sample Location / Description	Air Flow (LPM)	Air Time (Min.)	Air Volume (Liters)	Wipe Area (ft^2)	Water Volume (Liters)	Water Code[3]	Turn Around Time*	Lab ID #
W-1	7	5	Feb	24					144			Rush	TM-15-78885
W-2	7	5	Feb	24					144			Rush	78886
W-3									16				78887
W-4									16				78888
W-5									144				78889
W-6									144				78890
W-7									144				78891
W-8									16				78892
W-9									144				78893
W-10									144				78894
W-11									144				78895
W-12									144				78896
W-13									144				78897

Sample Type Codes*
1-Air 2-Water 3-Paint 4-Soil 5-Dust
6-Bulk 7-Wipe 8 - Other

Sample Media Codes*
1-Charcoal 2-Matched Weight, 0.8um
3-PVC filter 4-M CE 0.8 um , 37 mm
5 -Ghost Wipes™ 6. Passive badge
7. Other

Non-Responsive

COMMENTS:

* Applied to organic and inorganic analysis in cases of an emergency only. @ Applied to inorganic and organic samples. SD: Applied to organic and inorganic samples 7-10 business days.

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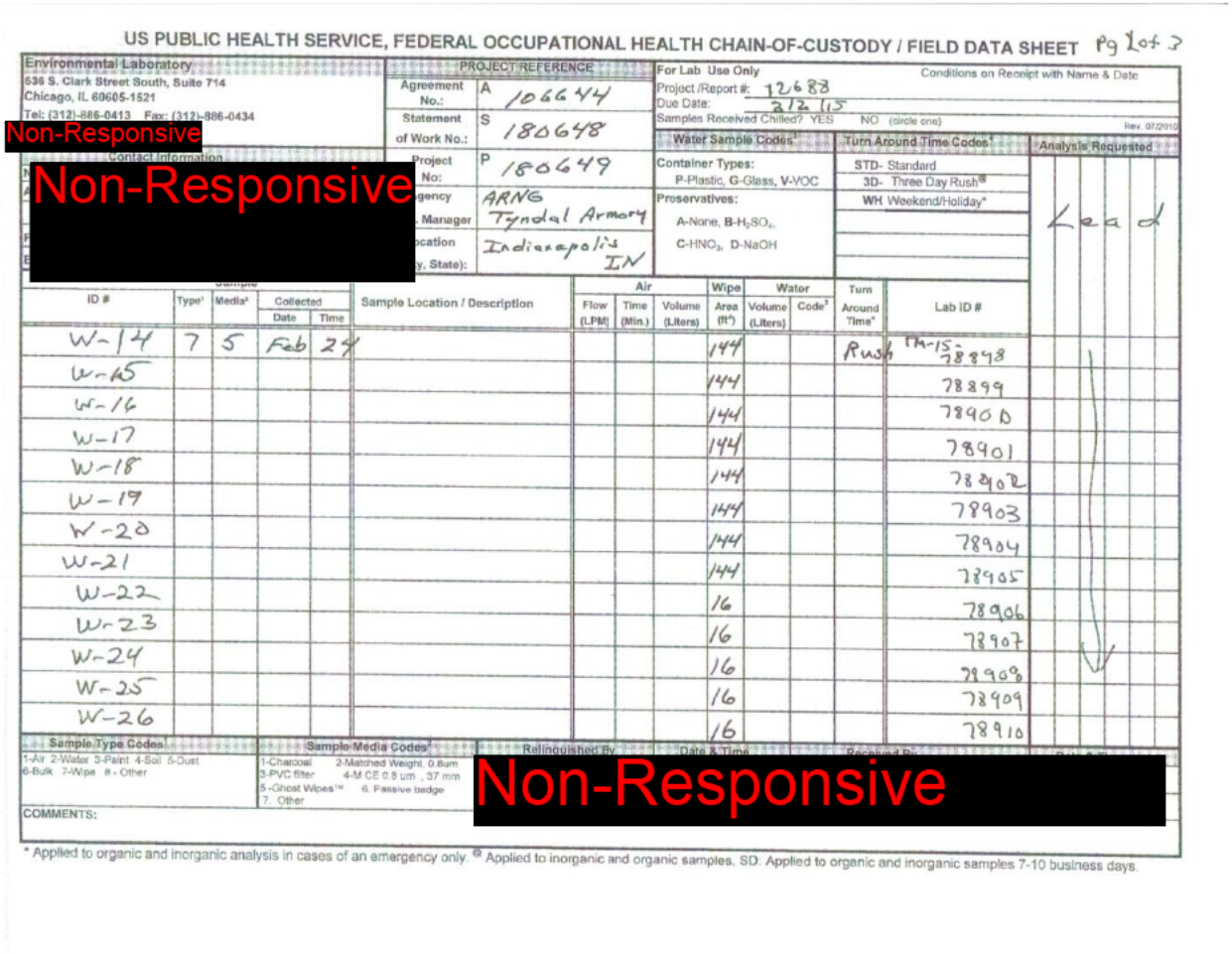
Lead Sampling Report



US PUBLIC HEALTH SERVICE, FEDERAL OCCUPATIONAL HEALTH CHAIN-OF-CUSTODY / FIELD DATA SHEET Pg 1 of 3

Environmental Laboratory
536 S. Clark Street South, Suite 714
Chicago, IL 60605-1521
Tel: (312)-886-0413 Fax: (312)-886-0434

Non-Responsive

Non-Responsive

PROJECT REFERENCE
Agreement No.: A 106644
Statement of Work No.: S 180648
Project No: P 180649
Agency: ARNG
Manager: Tyndal Armory
Location (City, State): Indianapolis IN

For Lab Use Only
Project /Report #: 12683
Due Date: 2/2/15
Samples Received Chilled? YES NO (circle one)
Conditions on Receipt with Name & Date
Rev. 07/2010

Water Sample Codes*
Container Types: P-Plastic, G-Glass, V-VOC
Preservatives: A-None, B-H_2SO_4, C-HNO_3, D-NaOH

Turn Around Time Codes*
STD- Standard
3D- Three Day Rush@
WH Weekend/Holiday*

Analysis Requested: Lead

ID #	Type¹	Media²	Collected Date	Collected Time	Sample Location / Description	Air Flow (LPM)	Air Time (Min.)	Air Volume (Liters)	Wipe Area (ft²)	Water Volume (Liters)	Water Code³	Turn Around Time*	Lab ID #
W-14	7	5	Feb	24					144			Rush	IM-15-78898
W-15									144				78899
W-16									144				78900
W-17									144				78901
W-18									144				78902
W-19									144				78903
W-20									144				78904
W-21									144				78905
W-22									16				78906
W-23									16				78907
W-24									16				78909
W-25									16				78909
W-26									16				78910

Sample Type Codes
1-Air 2-Water 3-Paint 4-Soil 5-Dust 6-Bulk 7-Wipe 8 - Other

Sample Media Codes²
1-Charcoal 2-Matched Weight, 0.8um 3-PVC filter 4-M CE 0.8 um , 37 mm 5-Ghost Wipes™ 6. Passive badge 7. Other

Relinquished By / Date & Time / Received By

Non-Responsive

COMMENTS:

* Applied to organic and inorganic analysis in cases of an emergency only. @ Applied to inorganic and organic samples. SD: Applied to organic and inorganic samples 7-10 business days.

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Lead Sampling Report

Pg 3 of 3

US PUBLIC HEALTH SERVICE, FEDERAL OCCUPATIONAL HEALTH CHAIN-OF-CUSTODY / FIELD DATA SHEET

Environmental Laboratory
536 S. Clark Street South, Suite 714
Chicago, IL 60605-1521
Non-Responsive
Non-Responsive

PROJECT REFERENCE
Agreement No.: A 106644
Statement of Work No.: S 180648
Project No: P 180649
Agency Proj. Manager: ARNG Tyndal Armory
Location (City, State): Indianapolis IN

For Lab Use Only
Project /Report #: 12688
Due Date: 3/2/15
Samples Received Chilled? YES NO (circle one)
Conditions on Receipt with Name & Date
Rev. 0/2010

Water Sample Codes*
Container Types: P-Plastic, G-Glass, V-VOC
Preservatives: A-None, B-H_2SO_4, C-HNO_3, D-NaOH

Turn Around Time Codes*
STD- Standard
3D- Three Day Rush[@]
WH Weekend/Holiday*

Analysis Requested: Lead

Sample ID #	Type*	Media*	Collected Date	Collected Time	Sample Location / Description	Air Flow (LPM)	Air Time (Min.)	Air Volume (Liters)	Wipe Area (ft²)	Water Volume (Liters)	Water Code*	Turn Around Time*	Lab ID #
W-27	7	5	Feb	24					16			Rush	TM-15 78911
W-28									16				78912
W-29									16				78913
W-30									16				78914
W-31									16				78915
Blank									—				78916
Blank									—				78917

Sample Type Codes*
1-Air 2-Water 3-Paint 4-Soil 5-Dust 6-Bulk 7-Wipe 8 - Other

Sample Media Codes*
1-Charcoal 2-Matched Weight, 0.8um 3-PVC filter 4-M CE 0.8 um , 37 mm 5 -Ghost Wipes™ 6. Passive badge 7. Other

Non-Responsive

COMMENTS:

* Applied to organic and inorganic analysis in cases of an emergency only. [@] Applied to inorganic and organic samples, SD: Applied to organic and inorganic samples 7-10 business days.

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