NATIONAL GUARD BUREAU
ARMY NATIONAL GUARD
NORTH REGION INDUSTRIAL HYGIENE OFFICE
301-IH OLD BAY LANE
HAVRE DE GRACE MD 21078

ARNG-CSG-P

3 July 2013

MEMORANDUM FOR Non-Responsive Occupational Health Nurse, Delaware Army National Guard, First Regiment Road, Wilmington, DE 19808

SUBJECT: Executive Summary (EXSUM) for the Industrial Hygiene Wipe Sampling Survey in the former Indoor Firing Range at the Readiness Center in Georgetown, DE on 25 June 2013.

1. PURPOSE. The purpose of this Industrial Hygiene (IH) survey was to evaluate the progress of the decontamination and conversion project at the former indoor firing range (IFR) in the Georgetown Readiness Center in Delaware.

2. CONCLUSION. The floor, trap wall, and right wall in the Georgetown Readiness Center's former IFR are still contaminated with lead and need to be cleaned again. Also, the back wall in the plenum room was reported contaminated as well.

3. RECOMMENDATIONS.

a. Decontamination Requirements. Re-clean the floor area and walls and decontaminate in accordance with guidance in NG Pam 420-15. (**RAC 3**) (NG Pam 420-15, reference 1)

b. Dust Removal. Wipe down or remove the baffles to remove any remaining lead and/or dust. (**RAC 4**) (NG Pam 420-15, reference 1)

c. Additional Sampling. Collect more wipe samples once the re-cleaning is completed. (**RAC 4**) (NG Pam 420-15, reference 1)

d. Limited Access. Continue to limit access to the former IFR area to personnel involved in the decontamination/conversion operation. (**RAC 4**) (NG PAM 420-15, reference 1)

e. Encapsulation. When re-sampling verifies that lead levels are below 200 µg/ft2, coat the walls will a sealant to encapsulate any remaining lead dust. Seal the concrete floors with deck enamel and then tile or cover with linoleum. (**RAC 4**) (NG PAM 420-15, reference 1)

4. ADDITIONAL ASSISTANCE. I am point of contact for this information and can be reached by phone at Non-Responsive or email at Non-Responsive

Non-Responsive
Regional Industrial Hygienist

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HAVRE DE GRACE MD 21078

INDUSTRIAL HYGIENE SURVEY
SURFACE WIPE SAMPLING FOR LEAD
FORMER INDOOR FIRING RANGE
GEORGETOWN, DE – 25 JUNE 2013

1. REFERENCES. See Appendix A.

2. PURPOSE. The purpose of this Industrial Hygiene (IH) survey was to evaluate the progress of the decontamination and conversion project at the former indoor firing range (IFR) in the Georgetown Readiness Center in Delaware.

3. GENERAL.

a. Background.

(1) The Delaware Army National Guard (DEARNG) Facilities Management office initiated a project to decontaminate and convert former IFRs in multiple facilities throughout the state.

(2) A contractor was hired to manage the project and was responsible for the oversight of the cleaning, decontamination, and conversion of each former IFR. The contractor then subcontracted with an independent firm to verify any remaining lead levels were below the 200 micrograms per square foot ($\mu g/ft^2$) limit as published in National Guard Pamphlet (NG PAM) 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges (reference 1).

(3) Once the contractor reported all facilities were below the 200 $\mu g/ft^2$ limit, the Army National Guard (ARNG) North Region Industrial Hygiene (IH) office's assistance was requested in order to verify the contractor's reports.

b. Survey Personnel. This survey was conducted on 25 June 2013 by:

(1) Non-Responsive Industrial Hygienist, ARNG North Region IH office

(2) Non-Responsive, IH Technician (Contractor), ARNG North Region IH office

(3) Non-Responsive, Occupational Health Nurse for the DEARNG.

c. Risk Assessment Codes (RACs). RACs are assigned to recommendations to help quantify risks to personnel and to aid in the establishment of funding priorities for corrective actions. Health RACs are determined by using the RAC table from the Department of Defense Instruction (DODI) 6055.1 (reference 2). This table is provided in Appendix B of this report.

4. METHODOLOGY.

a. Assessment Criteria.

(1) The United States Army, through DODI 6055.1, Section E3.4.1.2, directs that facilities provide healthful work environments in accordance with the most stringent standards applicable (reference 2).

(2) The Occupational Safety and Health Administration (OSHA), through the Code of Federal Regulations, have enforceable regulatory standards for workplace safety (reference 3).

(3) Department of the Army Pamphlet (DA PAM) 40-503, Industrial Hygiene Program, section 1-8, states that Army occupational exposure criteria will be based on the more stringent of standards published by OSHA as Permissible Exposure Limits (PELs), guidance from the American Conference of Governmental Industrial Hygienists (ACGIH) as Threshold Limit Values (TLVs), military unique standards or published guidance from other organizations when the primary standards are not applicable (references 4 and 5).

(4) In areas containing former IFRs, NG PAM 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, is used to determine satisfactory levels of any lead present in dust (reference 1).

(5) In areas not part of a former IFR (e.g. the drill hall adjacent to the former IFR), Department of Defense (DoD) Directive-Type Memorandum (DTM) 12-003, Control and Management of Surface Accumulations from Lead, Hexavalent Chromium, an Cadmium Operations, requires that surfaces are maintained as free as practicable of accumulations of lead (reference 6).

(6) When children are present, we refer to Title 24 of the Code of Federal Regulations, Part 35.1320, Lead-based paint inspections, paint testing, risk assessments, lead-hazard screens, and reevaluations (reference 7). This Housing and Urban Development (HUD) regulation lists a clearance level, specific to floors, of 40 $\mu g/ft^2$, in the table in section 35.1320(b)(2) and is used to determine if the dwelling unit, worksite or common area passes or fails the clearance test.

b. Wipe Sampling Protocol.

(1) Procedures. Surface wipe sampling methods were conducted in accordance with NG PAM 420-15 and OSHA's Technical Manual, 5th edition (references 1 and 8).

(2) Media. Ghost Wipes were used for sample collection and were placed in 68mL HotBlock digestion vessels. Templates (10 cm x 10 cm) were used to ensure uniform wipe area.

(3) Lab Analysis. All samples were sent to Aerosol Monitoring & Analysis (AMA) Analytical Services, Inc., an American Industrial Hygiene Association (AIHA) accredited

laboratory in Lanham, Maryland. The samples were analyzed using the Environmental Protection Agency (EPA) method 600/R-93/200(M)-7000B for Lead (reference 9) (see Appendix E).

5. FINDINGS AND DISCUSSION.

a. General Information. Prior to this visit, the contractor reported the former IFR was cleaned and all samples were below the 200 $\mu g/ft^2$ limit. The bullet trap, plenum components, soundproofing, lights, and firing points were removed. The baffles and radiant heaters were left in place. Five chain-link cages were installed.

b. Wipe Sampling. Surface wipe samples were collected in accordance with the guidance provided in NG Pam 420-15. Sample information is presented in Appendices C and D of this report.

c. Results. Out of 20 samples collected, 8 tested positive for lead. Five of these 8 were reported above 200 $\mu g/ft^2$, with 3 of those 5 above 1,000 $\mu g/ft^2$. Complete surface wipe sample results are provided in Appendix C of this report.

6. CONCLUSION. The floor, trap wall, and right wall in the Georgetown Readiness Center's former IFR are still contaminated with lead and need to be cleaned again. Also, the back wall in the plenum room was reported contaminated as well.

7. RECOMMENDATIONS.

a. Decontamination Requirements. Re-clean the floor area and walls and decontaminate in accordance with guidance in NG Pam 420-15. **(RAC 3)** (NG Pam 420-15, reference 1)

b. Dust Removal. Wipe down or remove the baffles to remove any remaining lead and/or dust. **(RAC 4)** (NG Pam 420-15, reference 1)

c. Additional Sampling. Collect more wipe samples once the re-cleaning is completed. **(RAC 4)** (NG Pam 420-15, reference 1)

d. Limited Access. Continue to limit access to the former IFR area to personnel involved in the decontamination/conversion operation. **(RAC 4)** (NG PAM 420-15, reference 1)

e. Encapsulation. When re-sampling verifies that lead levels are below 200 µg/ft2, coat the walls will a sealant to encapsulate any remaining lead dust. Seal the concrete floors with deck enamel and then tile or cover with linoleum. **(RAC 4)** (NG PAM 420-15, reference 1)

ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Georgetown Readiness Center, Georgetown, DE, 25 June 2013

8. ADDITIONAL ASSISTANCE. I am point of contact for this information and can be reached by phone at Non-Responsive or email at Non-Responsive

Non-Responsive
Regional Industrial Hygienist

APPENDIX – A
REFERENCES

1. National Guard Pamphlet (NG PAM) 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 November 2006.

2. Department of Defense Instruction (DODI) 6055.1, Department of Defense (DOD) Safety and Occupational Health (SOH) Program, 19 August 1998.

3. Title 29 Code of Federal Regulations, Part 1910.1025, Lead, Occupational Safety and Health Administration (OSHA), 2013 Edition.

4. Department of the Army Pamphlet (DA PAM) 40-503, The Army Industrial Hygiene Program, 2 April 2013.

5. Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, 2013, American Conference of Governmental Industrial Hygienists, Cincinnati, OH.

6. Department of Defense (DoD) Directive-Type Memorandum (DTM) 12-003, Control and Management of Surface Accumulations from Lead, Hexavalent Chromium, and Cadmium Operations, 18 April 2012.

7. Title 24 Code of Federal Regulations, Part 35.1320, Lead-based paint inspections, paint testing, risk assessments, lead-hazard screens, and reevaluations, Housing and Urban Development (HUD), 2013 Edition.

8. Occupational Safety and Health Administration Technical Manual, TED 01-00-015 [TED 1-0.15A], 5th Edition.

9. Environmental Protection Agency (EPA) Method 600/R-93/200(M), Field Analysis of Lead in Paint, Bulk Dust, and Soil by Ultrasonic, Acid Digestion and Colorimetric Measurement, September 1993.

APPENDIX – B
DERIVING RISK ASSESSMENT CODES (RACs) FOR HEALTH HAZARDS

(Taken from Table 2 of DODI 6055.1 (reference 2))

1. HEALTH HAZARD SEVERITY CODE (HHSC). Using the following procedures to assess points, 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

AER Possible?	Exposure Conditions			
	<AL	Occasionally>AL Always<OEL	>AL <=OEL	>OEL
NO	0	3	5	7
YES	1-2	4	6	8

AER = Alternate exposure route, such as skin absorption, ingestion.
AL = Action level, DoD component threshold that triggers surveillance actions, such as microWatts/cm^2, dB, parts per million.
OEL = Occupational Exposure Limit, DoD exposure limit, such as Threshold Limit Value and Permissible Exposure Limit.

b. Medical Effects Points Assessed.

Condition	Points
No medical effect, 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, non-severe illness or loss of capacity, such as permanent hearing loss	5-6
Permanent, severe, disabling irreversible illness or death, such as asbestosis and lung cancer	7-8

APPENDIX – B – CONTINUED
DERIVING RISK ASSESSMENT CODES (RACs) FOR HEALTH HAZARDS

c. Determine the HHSC by totaling the points assessed and using the following guide:

Total Points (sum of A and B, above)	HHSC
13-16	I
9-12	II
5-8	III
0-4	IV

2. ILLNESS PROBABILITY CODE (IPC). Using the following guides to assess points, determine the IPC for health hazards. The IPC is a function of the duration of exposure and the number of exposed personnel.

a. Duration of Exposure Points Assessed

Type of Exposure	Exposure Duration		
	1-8 hr/wk	>8hr/wk, not continuous	Continuous
Irregular, intermittent	1-2	4-6	-
Regular, periodic	2-3	5-7	8

b. Number of Exposed Personnel Points Assessed

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

APPENDIX – B – CONTINUED
DERIVING RISK ASSESSMENT CODES (RACs) FOR HEALTH HAZARDS

c. Determine the IPC for health hazards by totaling the points assessed and using the following guide:

Total Points (sum of A and B, above)	IPC
14-16	A
10-13	B
5-9	C
<5	D

3. Determine the RAC for health hazards by using the following matrix to measure health hazard severity and mishap probability factors.

HEALTH HAZARD SEVERITY CODE	ILLNESS PROBABILITY CODE			
	A	B	C	D
I	1	1	2	3
II	1	2	3	4
III	2	3	4	5
IV	3	4	5	5

4. RAC DESCRIPTOR

RAC	DESCRIPTOR
1	CRITICAL
2	SERIOUS
3	MODERATE
4	MINOR
5	NEGLIGIBLE

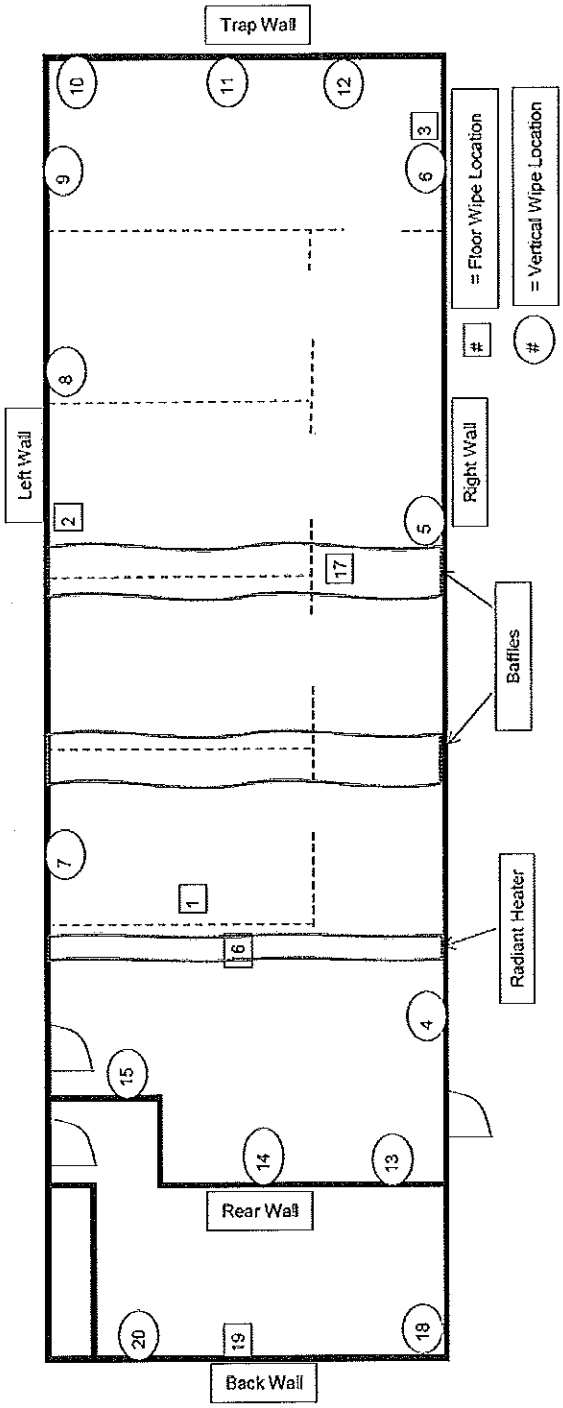
ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Georgetown Readiness Center, Georgetown, DE, 25 June 2013

APPENDIX – C
WIPE SAMPLE INFORMATION

			Distance From Wall:				
Sample Number	*Result*	*Location*	*Trap*	*Rear*	*Left*	*Right*	*Vertical Position:*
20130625 Georgetown DE 01	< 110 µg/ft²	Floor		16 ft		17 ft	
20130625 Georgetown DE 02	< 110 µg/ft²	Floor		41 ft		23 ft	
20130625 Georgetown DE 03	3100 µg/ft²	Floor	4 ft			2 in	
20130625 Georgetown DE 04	< 110 µg/ft²	Wall, Right		12 ft			6 ft from floor
20130625 Georgetown DE 05	< 110 µg/ft²	Wall, Right		20 ft			3 ft from floor
20130625 Georgetown DE 06	600 µg/ft²	Wall, Right	15 ft				1 ft from floor
20130625 Georgetown DE 07	< 110 µg/ft²	Wall, Left		24 ft			2 ft from floor
20130625 Georgetown DE 08	< 110 µg/ft²	Wall, Left		38 ft			6 ft from floor
20130625 Georgetown DE 09	190 µg/ft²	Wall, Left	5 ft				5 ft from floor
20130625 Georgetown DE 10	310 µg/ft²	Wall, Trap			1 ft		6 ft from floor
20130625 Georgetown DE 11	4400 µg/ft²	Wall, Trap				12 ft	1 ft from floor
20130625 Georgetown DE 12	1300 µg/ft²	Wall, Trap				3 ft	3 ft from floor
20130625 Georgetown DE 13	< 110 µg/ft²	Wall, Rear				3 ft	3 ft from floor
20130625 Georgetown DE 14	< 110 µg/ft²	Wall, Rear				10 ft	6 ft from floor
20130625 Georgetown DE 15	< 110 µg/ft²	Wall, Rear			4 ft		1 ft from floor
20130625 Georgetown DE 16	< 110 µg/ft²	Heater, Top	on top of radiant heater shield between entry doors				
20130625 Georgetown DE 17	130 µg/ft²	Baffle	on top of ceiling baffle plate, inside opening facing trap wall				
20130625 Georgetown DE 18	< 110 µg/ft²	Plenum Rm Wall, Right	2 inches from Back Wall, 6 feet from floor				
20130625 Georgetown DE 19	< 110 µg/ft²	Plenum Rm, Floor	13 feet from Right Wall, Adjacent to Back Wall				
20130625 Georgetown DE 20	200 µg/ft²	Plenum Rm, Wall, Back	19 feet from Right Wall, 3 feet from floor				
20130625 Georgetown DE 21	< 12 µg	BLANK					
20130625 Georgetown DE 22	< 12 µg	BLANK					

ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Georgetown Readiness Center, Georgetown, DE, 25 June 2013

APPENDIX – D
WIPE SAMPLE LOCATIONS



ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Georgetown Readiness Center, Georgetown, DE, 25 June 2013

APPENDIX – E
LABORATORY RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY

Client:	National Guard Bureau	Job Name:	Delaware IFR Lead Clearance	Chain Of Custody:	516206		
Address:	304-IH Old Bay Lane, Attn: ARNG-CIG-P, State Military Reservation	Job Location:	Georgetown, DE	Date Submitted:	6/27/2013		
	Havre de Grace, Maryland 21078	Job Number:	Not Provided	Person Submitting:	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	Date Analyzed:	6/28/2013	Report Date:	7/1/2013

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
13073796	20130625 Georgetown DE 01	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073797	20130625 Georgetown DE 02	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073798	20130625 Georgetown DE 03	Flame	Wipe	****	0.111	110	ug/ft²	350	3100	ug/ft²	
13073799	20130625 Georgetown DE 04	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073800	20130625 Georgetown DE 05	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073801	20130625 Georgetown DE 06	Flame	Wipe	****	0.111	110	ug/ft²	65	600	ug/ft²	
13073802	20130625 Georgetown DE 07	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073803	20130625 Georgetown DE 08	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073804	20130625 Georgetown DE 09	Flame	Wipe	****	0.111	110	ug/ft²	21	190	ug/ft²	
13073805	20130625 Georgetown DE 10	Flame	Wipe	****	0.111	110	ug/ft²	34	310	ug/ft²	
13073806	20130625 Georgetown DE 11	Flame	Wipe	****	0.111	110	ug/ft²	490	4400	ug/ft²	

An AIHA (#100470) and NY ELAP (#10320) Accredited Laboratory

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ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Georgetown Readiness Center, Georgetown, DE, 25 June 2013

APPENDIX – E – CONTINUED
LABORATORY RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY

Client:	National Guard Bureau	Job Name:	Delaware IFR Lead Clearance	Chain Of Custody:	516206
Address:	301-HOOAH Bay Lane, Attn: ARNG-CSG-P, State Military Reservation	Job Location:	Georgetown, DE	Date Submitted:	6/27/2013
	Havre de Grace, Maryland 21078	Job Number:	Not Provided	Person Submitting:	Non-Responsive
		P.O. Number:	W912K8-09-A-6003	Date Analyzed:	6/28/2013 Report Date: 7/1/2013
Attention:	Non-Responsive				

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
13073807	20130625 Georgetown DE 12	Flame	Wipe	****	0.111	110	ug/ft²	150	1360	ug/ft²	
13073808	20130625 Georgetown DE 13	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073809	20130625 Georgetown DE 14	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073810	20130625 Georgetown DE 15	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073811	20130625 Georgetown DE 16	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073812	20130625 Georgetown DE 17	Flame	Wipe	****	0.111	110	ug/ft²	14	130	ug/ft²	
13073813	20130625 Georgetown DE 18	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073814	20130625 Georgetown DE 19	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073815	20130625 Georgetown DE 20	Flame	Wipe	****	0.111	110	ug/ft²	22	200	ug/ft²	
13073816	20130625 Georgetown DE 21	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	
13073817	20130625 Georgetown DE 22	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	

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ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Georgetown Readiness Center, Georgetown, DE, 25 June 2013

APPENDIX – E – CONTINUED
LABORATORY RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY

Client:	National Guard Bureau	Job Name:	Delaware IFR Lead Clearance	Chain Of Custody:	516205		
Address:	301-111 Old Bay Lane, Attn: ARNG-CSG-P, State Military Reservation	Job Location:	Georgetown, DE	Date Submitted:	6/27/2013		
	Havre de Grace, Maryland 21078	Job Number:	Not Provided	Person Submitting:	Non-Responsive		
		P.O. Number:	W912K6-09-A-9003	Date Analyzed:	6/28/2013	Report Date:	7/1/2013

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B

See QC Summary for analytical results of quality control samples associated with these samples.

N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)
%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information not verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Non-Responsive

Technical Manager: Non-Responsive

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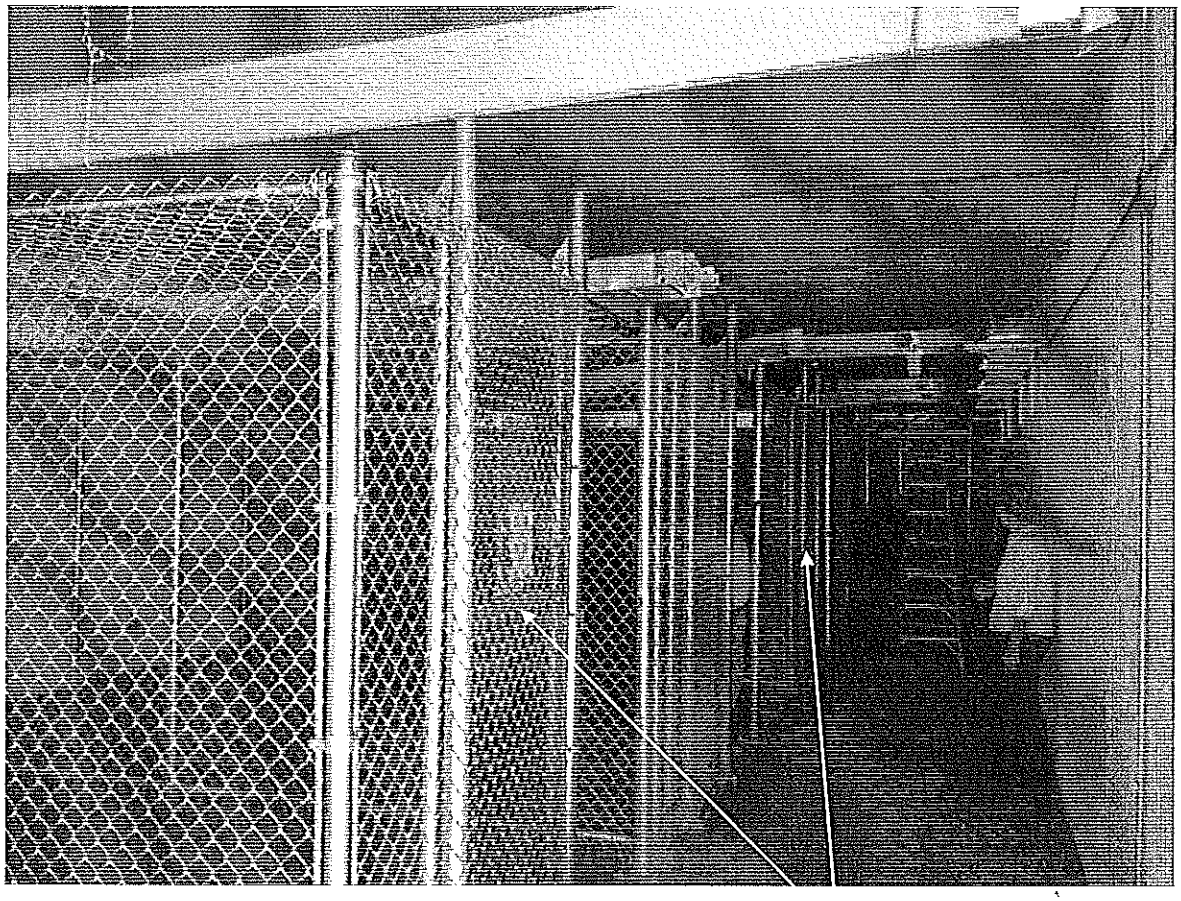
APPENDIX – F
PHOTOGRAPHS

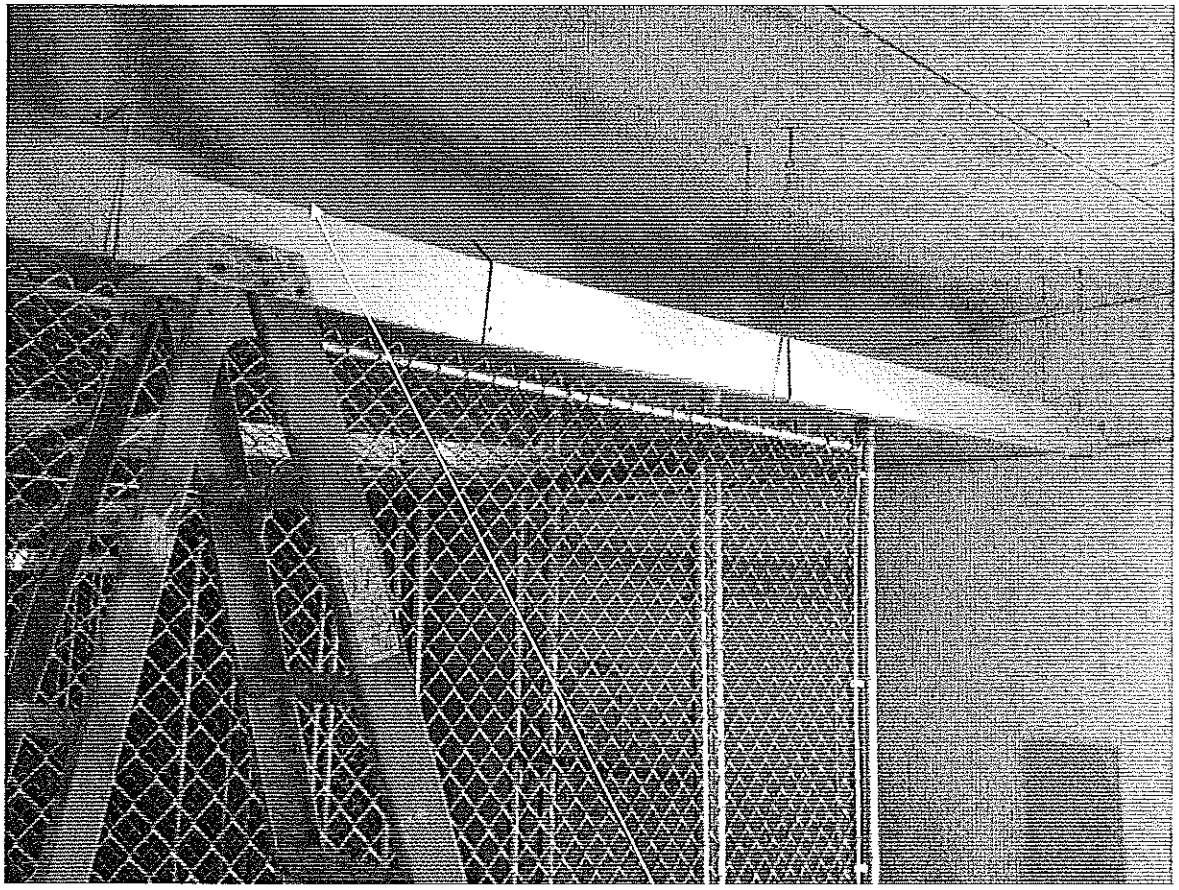
Picture 1:



View looking toward "trap" wall from back wall/entry door area. Cages run the length of the room.

APPENDIX – F – CONTINUED
PHOTOGRAPHS

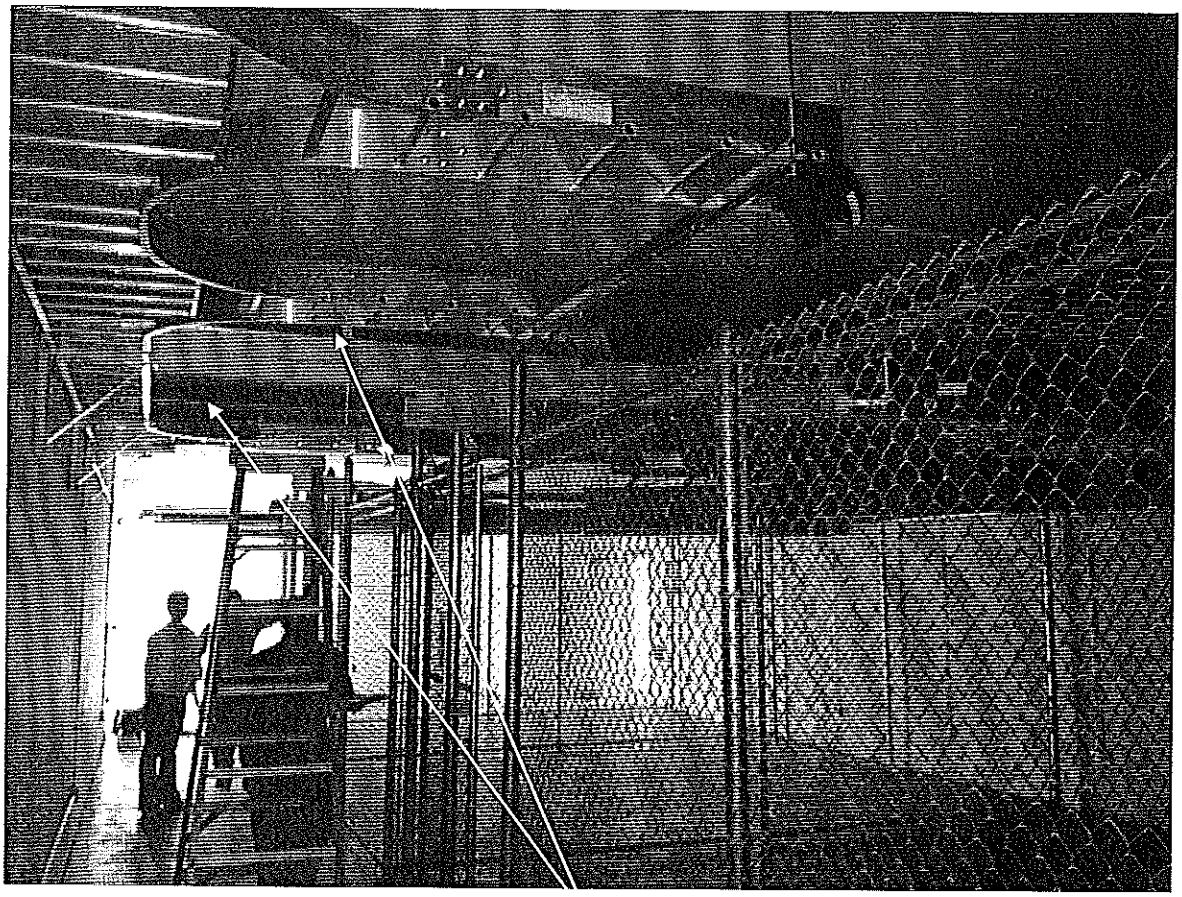
Picture 2:



View of the heater, with ladder in place at sampling location.

APPENDIX – F – CONTINUED
PHOTOGRAPHS

Picture 3:



View from the trap end toward the back wall. Baffles can be seen with ladder at the sampling location.

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INDUSTRIAL HYGIENE SURVEY
SURFACE WIPE SAMPLING FOR LEAD
FORMER INDOOR FIRING RANGE
GEORGETOWN, DE – 26 SEPTEMBER 2013

1. REFERENCES. See Appendix A.

2. PURPOSE. The purpose of this Industrial Hygiene (IH) survey was to reevaluate the progress of the decontamination and conversion project at the former indoor firing range (IFR) in the Georgetown Readiness Center, 109 West Pine St, Georgetown, Delaware.

3. GENERAL.

a. Background.

(1) The Delaware Army National Guard (DEARNG) Facilities Management office initiated a project to decontaminate and convert former IFRs in multiple facilities throughout the state.

(2) A contractor was hired to manage the project and was responsible for the oversight of the cleaning, decontamination, and conversion of each former IFR. The contractor then subcontracted with an independent firm to verify any remaining lead levels were below the 200 micrograms per square foot ($\mu g/ft^2$) limit as published in National Guard Pamphlet (NG PAM) 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges (reference 1).

(3) Once the contractor reported all facilities were below the 200 $\mu g/ft^2$ limit, personnel from the Army National Guard (ARNG) Northeat Region Industrial Hygiene (IH) office collected wipe samples for analysis. These sample results and locations are listed in Appendices C and D of this report.

(4) Upon review of the laboratory results, it was determined that some locations in this former IFR were still above the 200 $\mu g/ft^2$ limit. The DEARNG Facilities Management office, in consultation with the Occupational Health Nurse and the North Region IH office, brought the contractor back to clean the affected areas.

b. Survey Personnel. This survey was conducted on 26 September 2013 by Non-Responsive Industrial Hygienist, ARNG Midwest Region IH office

c. Risk Assessment Codes (RACs). RACs are assigned to recommendations to help quantify risks to personnel and to aid in the establishment of funding priorities for corrective actions. Health RACs are determined by using the RAC table from the Department of Defense Instruction (DODI) 6055.1 (reference 2).

4. METHODOLOGY.

a. Assessment Criteria.

(1) The United States Army, through DODI 6055.1, Section E3.4.1.2, directs that facilities provide healthful work environments in accordance with the most stringent standards applicable (reference 2).

(2) The Occupational Safety and Health Administration (OSHA), through the Code of Federal Regulations, have enforceable regulatory standards for workplace safety (reference 3).

(3) Department of the Army Pamphlet (DA PAM) 40-503, Industrial Hygiene Program, section 1-8, states that Army occupational exposure criteria will be based on the more stringent of standards published by OSHA as Permissible Exposure Limits (PELs), guidance from the American Conference of Governmental Industrial Hygienists (ACGIH) as Threshold Limit Values (TLVs), military unique standards or published guidance from other organizations when the primary standards are not applicable (references 4 and 5).

(4) In areas containing former IFRs, NG PAM 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, is used to determine satisfactory levels of any lead present in dust (reference 1).

b. Wipe Sampling Protocol.

(1) Procedures. Surface wipe sampling methods were conducted in accordance with NG PAM 420-15 and OSHA's Technical Manual, 5th edition (references 1 and 6).

(2) Media. Ghost Wipes were used for sample collection and were placed in 68mL HotBlock digestion vessels. Templates (10 cm x 10 cm) were used to ensure uniform wipe area.

(3) Lab Analysis. All samples were sent to Aerosol Monitoring & Analysis (AMA) Analytical Services, Inc., an American Industrial Hygiene Association (AIHA) accredited laboratory in Lanham, Maryland. The samples were analyzed using the Environmental Protection Agency (EPA) method 600/R-93/200(M)-7000B for Lead (reference 7) (see Appendix E).

5. FINDINGS AND DISCUSSION.

a. General Information. Prior to this visit, the contractor reported the former IFR was cleaned (2nd time) and all samples were below the 200 $\mu g/ft^2$ limit. The bullet trap, plenum components, soundproofing, lights, and firing points were removed. The baffles and radiant heaters were left in place. Five chain-link cages were installed.

b. Wipe Sampling. Surface wipe samples were collected in accordance with the guidance provided in NG Pam 420-15. Sample information is presented in Appendix B of this report.

c. Results. Out of 6 samples collected, 4 tested positive for lead. Three of these 4 were reported above 200 µg/ft^2, with none above 1,000 µg/ft^2. Complete surface wipe sample results are provided in Appendix B of this report.

6. CONCLUSION. The floor and trap wall in the Georgetown Readiness Center's former IFR are still contaminated with lead and need to be cleaned again.

7. RECOMMENDATIONS.

a. Decontamination Requirements. Re-clean the floor area and wall and decontaminate in accordance with guidance in NG Pam 420-15. (**RAC 3**) (NG Pam 420-15, reference 1)

b. Additional Sampling. Collect more wipe samples once the re-cleaning is completed. (**RAC 4**) (NG Pam 420-15, reference 1)

c. Limited Access. Continue to limit access to the former IFR area to personnel involved in the decontamination/conversion operation. (**RAC 4**) (NG PAM 420-15, reference 1)

d. Encapsulation. When re-sampling verifies that lead levels are below 200 µg/ft2, coat the walls will a sealant to encapsulate any remaining lead dust. Seal the concrete floors with deck enamel and then tile or cover with linoleum. (**RAC 4**) (NG PAM 420-15, reference 1)

8. ADDITIONAL ASSISTANCE. I am point of contact for this information and can be reached by phone at Non-Responsive or email at Non-Responsive.

[redacted] Non-Responsive [redacted]
[redacted]
Regional Industrial Hygienist

APPENDIX – A
REFERENCES

1. National Guard Pamphlet (NG PAM) 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 November 2006.

2. Department of Defense Instruction (DODI) 6055.1, Department of Defense (DOD) Safety and Occupational Health (SOH) Program, 19 August 1998.

3. Title 29 Code of Federal Regulations, Part 1910.1025, Lead, Occupational Safety and Health Administration (OSHA), 2013 Edition.

4. Department of the Army Pamphlet (DA PAM) 40-503, The Army Industrial Hygiene Program, 2 April 2013.

5. Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, 2013, American Conference of Governmental Industrial Hygienists, Cincinnati, OH.

6. Occupational Safety and Health Administration Technical Manual, TED 01-00-015 [TED 1-0.15A], 5th Edition.

7. Environmental Protection Agency (EPA) Method 600/R-93/200(M), Field Analysis of Lead in Paint, Bulk Dust, and Soil by Ultrasonic, Acid Digestion and Colorimetric Measurement, September 1993.

APPENDIX – B
WIPE SAMPLE INFORMATION

Sample Number	*Result*			*Location*
20130926 SC01	<	110	µg/ft^2	Plenum Rm, Floor
20130926 SC02		420	µg/ft^2	Floor, Near Trap, Along Right Wall
20130926 SC03		280	µg/ft^2	Wall, Trap
20130926 SC04		150	µg/ft^2	Floor, Trap
20130926 SC05	<	110	µg/ft^2	Floor, Trap
20130926 SC06		300	µg/ft^2	Floor, Near Trap, Along Left Wall
20130926 SC07	<	12	µg	BLANK

ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Georgetown Readiness Center, Georgetown, DE, 26 September 2013

APPENDIX – C
ORIGINAL WIPE SAMPLE INFORMATION

					Distance From Wall:				
Sample Number	**Result**			**Location**	**Trap**	**Rear**	**Left**	**Right**	**Vertical Position:**
20130625 Georgetown DE 01	<	110	µg/ft²	Floor		16 ft		17 ft	
20130625 Georgetown DE 02	<	110	µg/ft²	Floor		41 ft		23 ft	
20130625 Georgetown DE 03		**3100**	**µg/ft²**	**Floor**	**4 ft**			**2 in**	
20130625 Georgetown DE 04	<	110	µg/ft²	Wall, Right		12 ft			6 ft from floor
20130625 Georgetown DE 05	<	110	µg/ft²	Wall, Right		20 ft			3 ft from floor
20130625 Georgetown DE 06		**600**	**µg/ft²**	**Wall, Right**	**15 ft**				**1 ft from floor**
20130625 Georgetown DE 07	<	110	µg/ft²	Wall, Left		24 ft			2 ft from floor
20130625 Georgetown DE 08	<	110	µg/ft²	Wall, Left		38 ft			6 ft from floor
20130625 Georgetown DE 09		190	µg/ft²	Wall, Left	5 ft				5 ft from floor
20130625 Georgetown DE 10		**310**	**µg/ft²**	**Wall, Trap**			**1 ft**		**6 ft from floor**
20130625 Georgetown DE 11		**4400**	**µg/ft²**	**Wall, Trap**				**12 ft**	**1 ft from floor**
20130625 Georgetown DE 12		**1300**	**µg/ft²**	**Wall, Trap**				**3 ft**	**3 ft from floor**
20130625 Georgetown DE 13	<	110	µg/ft²	Wall, Rear				3 ft	3 ft from floor
20130625 Georgetown DE 14	<	110	µg/ft²	Wall, Rear				10 ft	6 ft from floor
20130625 Georgetown DE 15	<	110	µg/ft²	Wall, Rear			4 ft		1 ft from floor
20130625 Georgetown DE 16	<	110	µg/ft²	Heater, Top	on top of radiant heater shield between entry doors				
20130625 Georgetown DE 17		130	µg/ft²	Baffle	on top of ceiling baffle plate, inside opening facing trap wall				
20130625 Georgetown DE 18	<	110	µg/ft²	Plenum Rm Wall, Right	2 inches from Back Wall, 6 feet from floor				
20130625 Georgetown DE 19	<	110	µg/ft²	Plenum Rm, Floor	13 feet from Right Wall, Adjacent to Back Wall				
20130625 Georgetown DE 20		**200**	**µg/ft²**	**Plenum Rm, Wall, Back**	19 feet from Right Wall, 3 feet from floor				
20130625 Georgetown DE 21	<	12	µg	BLANK					
20130625 Georgetown DE 22	<	12	µg	BLANK					

APPENDIX – D
ORIGINAL WIPE SAMPLE LOCATIONS

ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Georgetown Readiness Center, Georgetown, DE, 26 September 2013

APPENDIX – E
LABORATORY RESULTS

Non-Responsive

Non-Responsive

Non-Responsive

Non-Responsive

NATIONAL GUARD BUREAU
ARMY NATIONAL GUARD
NORTHEAST REGION INDUSTRIAL HYGIENE OFFICE
301-IH OLD BAY LANE
HAVRE DE GRACE MD 21078

INDUSTRIAL HYGIENE SURVEY
SURFACE WIPE SAMPLING FOR LEAD
SCANNELL FORMER INDOOR FIRING RANGE
DELAWARE CITY, DE – 11 SEPTEMBER 2013

1. REFERENCES. See Appendix A.

2. PURPOSE. The purpose of this Industrial Hygiene (IH) survey was to reevaluate the progress of the decontamination and conversion project at the former indoor firing range (IFR) in the Scannell Readiness Center, 248 Kent Ave, Delaware City, Delaware.

3. GENERAL.

a. Background.

(1) The Delaware Army National Guard (DEARNG) Facilities Management office initiated a project to decontaminate and convert former IFRs in multiple facilities throughout the state.

(2) A contractor was hired to manage the project and was responsible for the oversight of the cleaning, decontamination, and conversion of each former IFR. The contractor then subcontracted with an independent firm to verify any remaining lead levels were below the 200 micrograms per square foot ($\mu g/ft^2$) limit as published in National Guard Pamphlet (NG PAM) 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges (reference 1).

(3) Once the contractor reported all facilities were below the 200 $\mu g/ft^2$ limit, the Army National Guard (ARNG) North Region Industrial Hygiene (IH) office's assistance was requested in order to verify the contractor's reports. These sample results and locations are listed in Appendices C and D of this report.

(4) Upon review of the laboratory results, it was determined that some locations in this former IFR were still above the 200 $\mu g/ft^2$ limit. The DEARNG Facilities Management office, in consultation with the Occupational Health Nurse and the North Region IH office, brought the contractor back to clean the affected areas.

b. Survey Personnel. This survey was conducted on 11 September 2013 by Non-Responsive, Industrial Hygienist, ARNG Midwest Region IH office.

c. Risk Assessment Codes (RACs). RACs are assigned to recommendations to help quantify risks to personnel and to aid in the establishment of funding priorities for corrective actions. Health RACs are determined by using the RAC table from the Department of Defense Instruction (DODI) 6055.1 (reference 2).

4. METHODOLOGY.

a. Assessment Criteria.

(1) The United States Army, through DODI 6055.1, Section E3.4.1.2, directs that facilities provide healthful work environments in accordance with the most stringent standards applicable (reference 2).

(2) The Occupational Safety and Health Administration (OSHA), through the Code of Federal Regulations, have enforceable regulatory standards for workplace safety (reference 3).

(3) Department of the Army Pamphlet (DA PAM) 40-503, Industrial Hygiene Program, section 1-8, states that Army occupational exposure criteria will be based on the more stringent of standards published by OSHA as Permissible Exposure Limits (PELs), guidance from the American Conference of Governmental Industrial Hygienists (ACGIH) as Threshold Limit Values (TLVs), military unique standards or published guidance from other organizations when the primary standards are not applicable (references 4 and 5).

(4) In areas containing former IFRs, NG PAM 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, is used to determine satisfactory levels of any lead present in dust (reference 1).

b. Wipe Sampling Protocol.

(1) Procedures. Surface wipe sampling methods were conducted in accordance with NG PAM 420-15 and OSHA's Technical Manual, 5th edition (references 1 and 6).

(2) Media. Ghost Wipes were used for sample collection and were placed in 68mL HotBlock digestion vessels. Templates (10 cm x 10 cm) were used to ensure uniform wipe area.

(3) Lab Analysis. All samples were sent to Aerosol Monitoring & Analysis (AMA) Analytical Services, Inc., an American Industrial Hygiene Association (AIHA) accredited laboratory in Lanham, Maryland. The samples were analyzed using the Environmental Protection Agency (EPA) method 600/R-93/200(M)-7000B for Lead (reference 7) (see Appendix E).

5. FINDINGS AND DISCUSSION.

a. General Information. Prior to this visit, the contractor reported the former IFR was cleaned (2nd time) and all samples were below the 200 $\mu g/ft^2$ limit. The bullet trap, plenum components, soundproofing, and firing points were removed. Parts of the soundproofing material and some of the adhesive mastic were still on the walls at the time of this survey. Lockers were also present in the former IFR.

b. Wipe Sampling. Surface wipe samples were collected in accordance with the guidance provided in NG Pam 420-15. Sample information is presented in Appendix B of this report.

c. Results. Out of 9 samples collected, 5 tested positive for lead. Two of these 5 were reported above 200 µg/ft^2, while none were reported above 1,000 µg/ft^2. Complete surface wipe sample results are provided in Appendix B of this report.

6. CONCLUSION. The floor and trap wall in the former range area are still contaminated with lead and need to be cleaned again. Also, the soundproofing and mastic should be completely removed from the walls prior to encapsulation.

7. RECOMMENDATIONS.

a. Decontamination Requirements. Re-clean the floor areas and trap wall in accordance with guidance in NG Pam 420-15. (**RAC 3**) (NG Pam 420-15, reference 1)

b. Soundproofing/Mastic Removal. Remove all soundproofing and mastic from the walls prior to any encapsulation efforts. (**RAC 4**) (NG Pam 420-15, reference 1)

c. Additional Sampling. Collect more wipe samples once the re-cleaning is completed. (**RAC 4**) (NG Pam 420-15, reference 1)

d. Limited Access. Continue to limit access to the former IFR area to personnel involved in the decontamination/conversion operation. (**RAC 4**) (NG PAM 420-15, reference 1)

e. Encapsulation. When re-sampling verifies that lead levels are below 200 µg/ft2, coat the walls will a sealant to encapsulate any remaining lead dust. Seal the concrete floors with deck enamel and then tile or cover with linoleum. (**RAC 4**) (NG PAM 420-15, reference 1)

8. ADDITIONAL ASSISTANCE. I am point of contact for this information and can be reached by phone at Non-Responsive or email at Non-Responsive

[redacted] Non-Responsive [redacted]
[redacted]
Regional Industrial Hygienist

APPENDIX – A
REFERENCES

1. National Guard Pamphlet (NG PAM) 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 November 2006.

2. Department of Defense Instruction (DODI) 6055.1, Department of Defense (DOD) Safety and Occupational Health (SOH) Program, 19 August 1998.

3. Title 29 Code of Federal Regulations, Part 1910.1025, Lead, Occupational Safety and Health Administration (OSHA), 2013 Edition.

4. Department of the Army Pamphlet (DA PAM) 40-503, The Army Industrial Hygiene Program, 2 April 2013.

5. Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, 2013, American Conference of Governmental Industrial Hygienists, Cincinnati, OH.

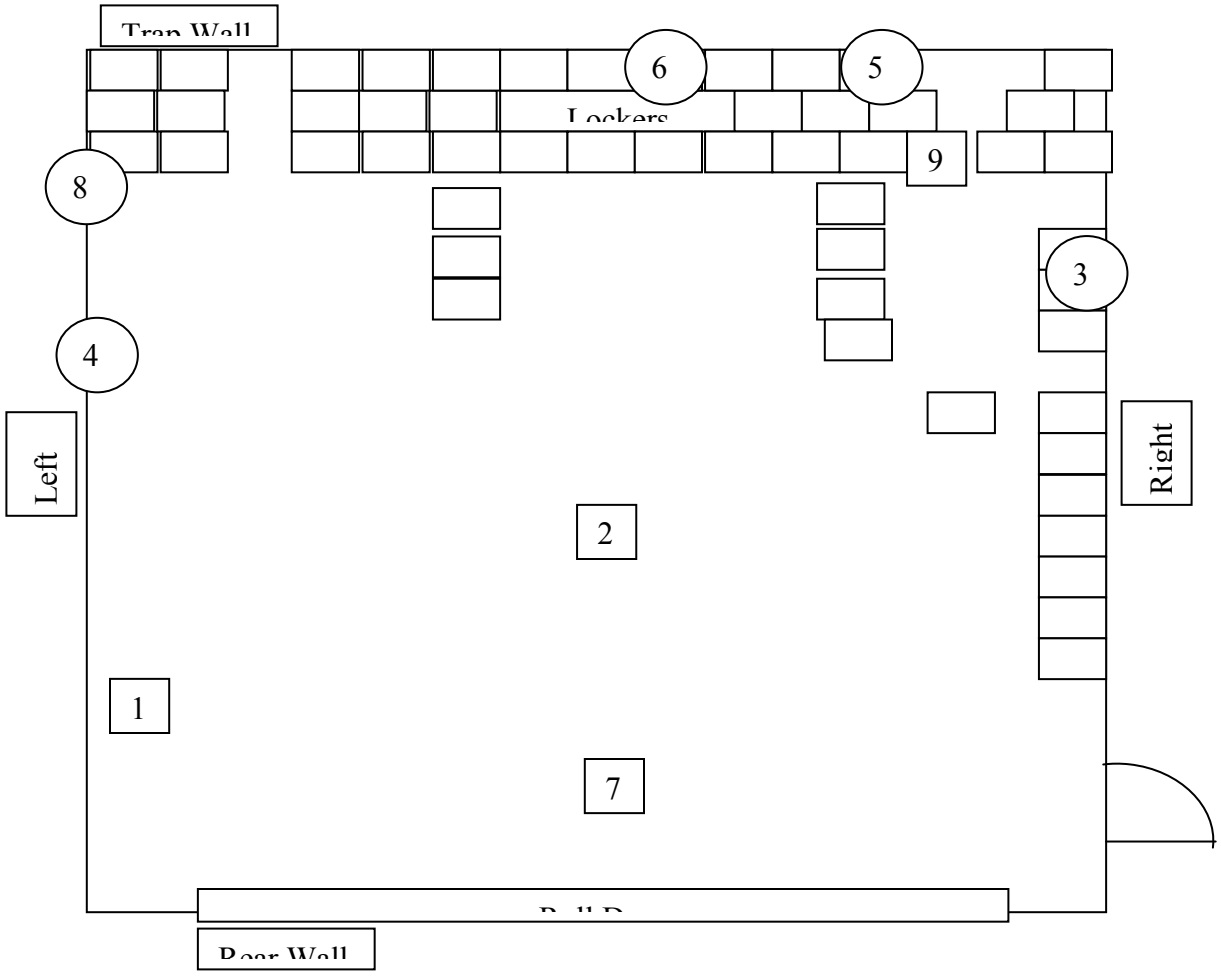
6. Occupational Safety and Health Administration Technical Manual, TED 01-00-015 [TED 1-0.15A], 5th Edition.

7. Environmental Protection Agency (EPA) Method 600/R-93/200(M), Field Analysis of Lead in Paint, Bulk Dust, and Soil by Ultrasonic, Acid Digestion and Colorimetric Measurement, September 1993.

ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Scannell Readiness Center, Delaware City, DE, 11 September 2013

APPENDIX – B
WIPE SAMPLE INFORMATION

Sample Number	*Result*		*Location*
20130911 SC01	< 110	µg/ft^2	Floor, Near Left/Rear Wall
20130911 SC02	190	µg/ft^2	Floor, Center of Room
20130911 SC03	< 110	µg/ft^2	Wall, Right, Near Trap
20130911 SC04	130	µg/ft^2	Wall, Left, Middle
20130911 SC05	490	µg/ft^2	Wall, Trap, Right Side
20130911 SC06	140	µg/ft^2	Wall, Trap, Middle
20130911 SC07	< 110	µg/ft^2	Floor, Middle, Near Rear Wall
20130911 SC08	< 110	µg/ft^2	Wall, Left, Near Trap
20130911 SC09	740	µg/ft^2	Floor, Near Trap, Right Side
20130926 SC10	< 12	µg	BLANK



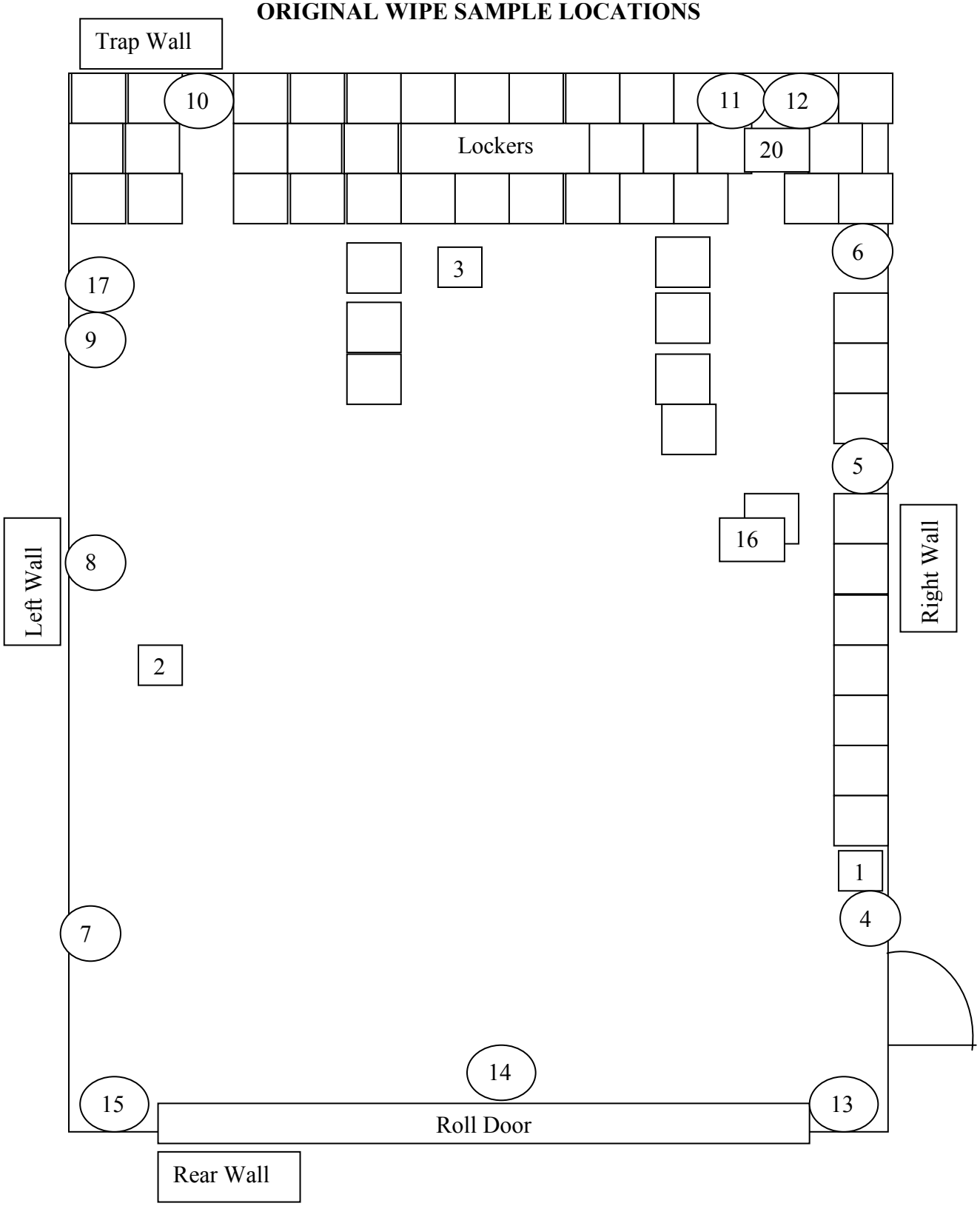
ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Scannell Readiness Center, Delaware City, DE, 11 September 2013

APPENDIX – C
ORIGINAL WIPE SAMPLE INFORMATION

				Distance From Wall:				
Sample Number	**Result**		**Location**	**Trap**	**Rear**	**Left**	**Right**	**Vertical Position:**
20130626 Scannell DE 01	< 110	µg/ft^2	Floor		10 ft		6 in	
20130626 Scannell DE 02	**350**	**µg/ft^2**	**Floor**		**32 ft**	**2 ft**		
20130626 Scannell DE 03	**280**	**µg/ft^2**	**Floor**	**9 ft**			**10 ft**	
20130626 Scannell DE 04	< 110	µg/ft^2	Wall, Right		6 ft			6 ft from floor
20130626 Scannell DE 05	< 110	µg/ft^2	Wall, Right		50 ft			3 ft from floor
20130626 Scannell DE 06	**1,000**	**µg/ft^2**	**Wall, Right**	**9 ft**				**1 ft from floor**
20130626 Scannell DE 07	< 110	µg/ft^2	Wall, Left		8 ft			6 ft from floor
20130626 Scannell DE 08	< 110	µg/ft^2	Wall, Left		25 ft			3 ft from floor
20130626 Scannell DE 09	**240**	**µg/ft^2**	**Wall, Left**	**21 ft**				**1 ft from floor**
20130626 Scannell DE 10	140	µg/ft^2	Wall, Trap			4 ft		3 ft from floor
20130626 Scannell DE 11	**31,000**	**µg/ft^2**	**Wall, Trap**				**3 ft**	**6 ft from floor**
20130626 Scannell DE 12	**230**	**µg/ft^2**	**Wall, Trap**				**3 ft**	**1 ft from floor**
20130626 Scannell DE 13	< 110	µg/ft^2	Wall, Rear				6 in	6 ft from floor
20130626 Scannell DE 14	**300**	**µg/ft^2**	**Wall, Rear**				**10 ft**	**4 ft from floor**
20130626 Scannell DE 15	< 110	µg/ft^2	Wall, Rear			1 ft		1 ft from floor
20130626 Scannell DE 16	< 110	µg/ft^2	Locker Top	Locker tag: SPC Sandoval, B				
20130626 Scannell DE 17	**1,000**	**µg/ft^2**	**Vertical Beam**	**Beam on Left Wall, 24 feet from Trap Wall / 4 feet from floor on the Rear Wall side of Beam**				
20130626 Scannell DE 20	**800**	**µg/ft^2**	**Floor**	**3 feet from Right Wall / 1 foot from Trap Wall, on floor under lockers**				
20130626 Scannell DE 18	< 12	µg	BLANK					
20130626 Scannell DE 19	< 12	µg	BLANK					

ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Scannell Readiness Center, Delaware City, DE, 11 September 2013

APPENDIX – D
ORIGINAL WIPE SAMPLE LOCATIONS



ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Scannell Readiness Center, Delaware City, DE, 11 September 2013

APPENDIX – E
LABORATORY RESULTS

Non-Responsive

Non-Responsive

Non-Responsive

Non-Responsive

NATIONAL GUARD BUREAU
ARMY NATIONAL GUARD
REGION NORTH INDUSTRIAL HYGIENE OFFICE
ATTN: NGB-AVN-SI
301-IH OLD BAY LANE
STATE MILITARY RESERVATION
HAVRE DE GRACE, MARYLAND 21078

NGB-AVN-SI (40-5) 9 March 2000

MEMORANDUM FOR Commander, A Company, 280th Signal Battalion, LTC John H. Pigman Armory, P.O. Box 720, Seaford, DE 19973-0720

SUBJECT: Indoor Firing Range Survey Report

1. Enclosed is the industrial hygiene survey report completed by the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) on the indoor firing range in your armory.

2. Evaluation within this report includes the following areas and programs:

- Ventilation Systems
- Air Sampling
- Housekeeping
- Respiratory Protection
- Personal Protective Equipment
- Lighting
- Training Programs

3. I concur with the recommendations made by 1LT [redacted] and with his classification of the range as UNSAFE FOR USE. He conducted a very thorough inspection and made many recommendations for improvement.

4. The results of one air sample was 0.04 mg/m^3. According to NGR 385-15, this documented level of lead mandates a reduced amount of time in the firing range for military who are exposed over 30 days and for all non-military personnel who fire in the range. Those personnel are not allowed to fire more than 4.5 hours a day in the firing range. Please ensure that this rule is followed and that exposure times are documented for these individuals.

NGB-AVN-SI (40-5), 9 Mar 00
SUBJECT: Baseline Industrial Hygiene Report

5. Please contact me at (410) 942-0273 or 1-800-550-6967 if you have any questions regarding the enclosed report.

Non-Responsive

Encl
Survey Report

Industrial Hygienist

CF:
DEARNG State Safety Manager, ATTN: CW4 Non-Responsive

DEPARTMENT OF THE ARMY
U.S. ARMY CENTER FOR HEALTH PROMOTION AND PREVENTIVE MEDICINE - NORTH
4411 LLEWELLYN AVENUE
FORT GEORGE G. MEADE, MARYLAND 20755-5225

REPLY TO
ATTENTION OF

17 FEB 2000

MCHB-AN-IH (40-5f)

MEMORANDUM FOR Chief, Army National Guard Readiness Center, Director of Army Aviation and Safety, ATTN: NGB-AVN-S, 111 South George Mason Drive, Arlington, Virginia 22204-1382

SUBJECT: Industrial Hygiene Study No. 55-NH-4426-99, Pigman Armory Indoor Firing Range, Delaware Army National Guard, 15 – 16 September 1999.

Copies of this report, with executive summary, are enclosed. Please call 1LT Non-Responsive [DSN Non-Responsive or commercial Non-Responsive ext. Non-Responsive if additional assistance is required.

Encl

Non-Responsive
LTC, MS
Commanding

CF (w/encl):
HQDA (NGB-ARP-H)
HQDA (NGB-AVN-SI-N) (3 cy)
TAG, STATE OF DELEWARE, ATTN: STATE SAFETY MANAGER
CDR, MEDCOM, ATTN: MCHO-CL-W
CDR, AMEDDC&S, ATTN: MCHA-MP
CDR, NARMC
CDR, WRAMC, ATTN: PVNTMED SVC
CDR, USAMEDDAC, FGGM, ATTN: PVNTMED SVC
CDR, USACHPPM, ATTN: MCHB-TS-OFS
CDR, USACHPPM, ATTN: MCHB-CS-IID
CDR, USACHPPM-SOUTH, ATTN: MCHB-AS-IH
CDR, USACHPPM-WEST, ATTN: MCHB-AW-IH

Readiness thru Health

DEPARTMENT OF THE ARMY
U.S. ARMY CENTER FOR HEALTH PROMOTION AND PREVENTIVE MEDICINE - NORTH
4411 LLEWELLYN AVENUE
FORT GEORGE G. MEADE, MARYLAND 20755-5225

REPLY TO
ATTENTION OF

EXECUTIVE SUMMARY
INDUSTRIAL HYGIENE STUDY NO. 55-NH-4426-99
PIGMAN ARMORY INDOOR FIRING RANGE
DELEWARE ARMY NATIONAL GUARD
15 - 16 SEPTEMBER 1999

1. PURPOSE. To evaluate lead exposure and engineering controls of an indoor firing range located at the Pigman Armory, Seaford, Delaware, and recommend appropriate corrective actions.

2. CONCLUSIONS. The Pigman Armory, Seaford, Delaware, Indoor Firing Range is concluded to be UNSAFE FOR USE, according to applicable criteria.

3. RECOMMENDATIONS. Discontinue use of the firing range until modifications or upgrades can be accomplished to the building envelope, make up air system, and exhaust ventilation system, and schedule a re-evaluation through the National Guard Bureau Industrial Hygiene Office. Implement written procedures, policies and facility modifications, as delineated in this report. Conduct detailed annual inspections using DA FORM 5688-R within forty-five days of the anniversary date of the last annual inspection. Procure and use a High Efficiency Particulate Air (HEPA) vacuum system for routine cleaning of the range. Designate personnel responsible as range officer, range non-commissioned officer, and range cleaning personnel; enroll them in an annual blood lead-monitoring program; and provide training in the proper procedures for cleaning the facility. Establish and implement a Respiratory Protection Program that meets all regulatory requirements.

DEPARTMENT OF THE ARMY
U.S. ARMY CENTER FOR HEALTH PROMOTION AND PREVENTIVE MEDICINE - NORTH
4411 LLEWELLYN AVENUE
FORT GEORGE G. MEADE, MARYLAND 20755-5225

REPLY TO
ATTENTION OF

17 FEB 2000

INDUSTRIAL HYGIENE STUDY NO. 55-NH-4426-99
PIGMAN ARMORY INDOOR FIRING RANGE
DELEWARE ARMY NATIONAL GUARD
15 – 16 SEPTEMBER 1999

1. REFERENCES. See Appendix A for a listing of references.

2. AUTHORITY. This survey was conducted at the request of the Industrial Hygiene Office, National Guard Bureau, Havre de Grace, Maryland.

3. PURPOSE. To evaluate lead exposure and engineering controls at the Pigman Armory, Seaford Delaware, indoor firing range, and recommend appropriate corrective actions.

4. GENERAL.

a. Personnel Contacted.

(1) CW4 Non-Responsive, State Safety Manager, Delaware Army National Guard.

(2) SFC Non-Responsive Readiness NCO, A Company, 280TH Signal Battalion.

(3) Non-Responsive, Industrial Hygienist, Industrial Hygiene Office, National Guard Bureau, Havre de Grace, Maryland.

b. Entrance/Exit Briefings. An entrance briefing was conducted with SFC Non-Responsive Readiness NCO, A Company, 280TH Signal Battalion, and CW4 Non-Responsive Non-Responsive Safety Manager, Delaware Army National Guard, on 15 September 1999. An exit briefing was conducted on 16 September 1999 with SFC Non-Responsive at which time preliminary findings and recommendations were discussed.

c. Study Personnel. 1LT Non-Responsive ESO (Environmental Science Officer), and CPT Non-Responsive ESO, both of the Industrial Hygiene Division, US Army Center for Health Promotion and Preventive Medicine (USACHPPM)-North, Fort George G. Meade, Maryland, conducted this study.

d. Background. The Pigman Armory firing range is a three-position indoor facility, constructed in October 1984, and is used for weapons familiarization by National Guard personnel, local police agencies, and Naval Junior Reserve Officer Training Corps (JROTC) personnel. This indoor range was classified as "Safe", as per Memorandum, National Guard Bureau (NGB) Regional Industrial Hygiene Office, NGB-AVN-SI, 23 November 1994, subject: Indoor Firing Range Survey.

5. GENERAL PROCEDURES.

a. Assessment Criteria.

(1) Atmospheric Lead. The Occupational Safety and Health Administration (OSHA) standard for inorganic lead [29 CFR 1910.1025 (reference 1)] has established a permissible exposure limit (PEL) of 50 micrograms of inorganic lead per cubic meter of air ($\mu g/m^3$) and an action level (AL) of 30 $\mu g/m^3$, both expressed as time-weighted averages over an eight-hour workday (TWA_8). This standard prescribes certain required actions and/or controls when the PEL and/or action level (AL) are exceeded (reference 1), and mandates actions to reduce occupational exposures to airborne lead at indoor ranges to levels below the action level.

(2) Ventilation Criteria. Indoor firing range ventilation criteria are delineated in Plate VS-99-04, page 10-165, of the Industrial Hygiene Ventilation Manual (reference 3) and National Guard Regulation 385-15 (reference 2).

b. Calibration. All sampling trains and ventilation instruments used in this study were calibrated against National Institute of Standards and Technology-traceable instruments in accordance with manufacturers' and USACHPPM procedures.

c. Methodology.

(1) Procedures. Sampling methods and procedures, except where noted, were performed in accordance with USACHPPM Technical Guide (TG) 141, Industrial Hygiene Sampling Instructions (reference 4).

(2) Air Samples. Personal breathing zone (BZ) and general area (GA) air samples were collected continuously over an entire firing session using calibrated portable sampling pumps drawing metered volumes of air across standard 0.8

micron, mixed-cellulose ester (MCE) filters. All samples were analyzed for inorganic lead using National Institute of Occupational and Safety (NIOSH) method 7300. Analytical results are presented in Appendix B of this report.

(3) Wipe Samples. Wipe samples were collected using Whatman™ No. 40 filter papers wetted with distilled water. A surface area of approximately 100 cm^2 was sampled with each filter using fresh, dust-free, disposable gloves. Each individual sample was placed in a clean sample container and submitted for laboratory analysis for inorganic lead. All samples were analyzed using EPA reference method 6010. Analytical results are presented in Appendix C of this report.

(4) Ventilation. All ventilation measurements were obtained using a calibrated, precision, heated-wire, digital anemometer. Ventilation was evaluated as specified in references 2 and 3. Ventilation smoke canisters and smoke bombs provided a visual assessment of airflow patterns and ventilation exhaust effectiveness. Firing line measurements were taken at each firing point at levels representing the approximate heights of the firers' BZ when firing from the standing, kneeling, and prone positions. Velocity pressure measurements using pitot traverses were also collected on the make up air (MUA) units in the plenum room as well as the exhaust air (EA) units located in the firing range to verify the correct airflow in the range.

d. Risk Assessment Codes (RACs). Risk Assessment Codes are assigned to recommendations to help quantify health risks to affected personnel and to aid in establishing funding priorities for corrective actions. Risk Assessment Codes are determined using the RAC table from Department of Defense Instruction 6055.1 (reference 5), which is reproduced as Appendix D.

6. FINDINGS AND DISCUSSION.

a. General.

Whatman™ is a registered trademark of the Whatman Corporation use of the trademarked name does not imply endorsement by the U.S. Army, but is intended only to assist identification of a specific product.

(1) Exposure Evaluation. Airborne inorganic lead exposures are based on measured BZ and GA concentrations during range use involving three firers, firing M16A1 rifles with .22 caliber ammunition adapters and one range safety officer. No weapon cleaning was performed after firing. The BZ and GA samples, both inside the range and in adjoining areas, were collected to characterize lead exposure potential and the effectiveness of the range ventilation system. Wipe samples were taken to assess the level of residual lead contamination.

(2) Study Data. The sampling results and ventilation performance data presented in this report represent conditions existing at the time of this study.

(3) Description. The Pigman Armory indoor firing range is 61.8 feet (ft) in length from the perforated plenum wall to the bullet trap, 13.65 ft in width, and slopes from right to left facing down range with a right side height of 9.67 ft and a left side height of 9.5 ft. The walls are constructed of concrete block with acoustical tile starting from the plenum wall and running 22.2 ft down the firing range and ending in a 90^0 angle on the left and right of the range, which does not conform to NGR 385-15, 2-2a(1)(b) (reference 2), which requires all protruding surfaces be baffled or covered to prevent ricochets. Based on the criteria outlined in NGR 385-15, the range is classified as UNSAFE FOR USE. The plenum wall consists of sheets of pegboard with holes 1/4 inch in diameter, for a total of 5.07sq/ft^2 of open area. The facility is equipped with one ceiling mounted exhaust fan located in front of the bullet trap. The make-up air unit (MUA) is passive in design, and air is pulled through a series of louvers, with an area of 5.07 total sq/ft^2, is distributed through a perforated plenum wall, subsequently moved downrange, and exhausted through a single exhaust unit. The exhaust unit at the front of the range had exposed conduit which should be baffled or covered IAW NGR 385-15, 2-2a(1)(b).

(4) Plenum. There is currently no access to the plenum room either from inside the range itself or an exterior entrance. To access the plenum room a panel was removed from the plenum wall and a study team member stepped inside; then the panel was reinstalled and measurements taken. The plenum wall was constructed with steel supports and a peg board skin with 1/4 inch diameter holes. The plenum wall has 5.07 total sq/ft^2 of open area, which equals 4% total surface area of the plenum wall. The motor that controlled the louvers for the passive MUA was inoperable, and the louvers on the MUA unit were stuck in the open

position. A qualified person should service or replace the MUA motor to bring it back into an operable condition.

(5) Building Envelope. The top of plenum wall adjacent to the emergency light was bowed and was not in compliance with ARNG DG 415-1, APP. A, 3-1f(4), (reference 10), that requires the plenum wall to be adequately supported to avoid flexing. An open floor drain in the middle of range was open and emitting a sewer odor into the range. According to NGR 385-15, 2-2a(2)(c) (reference 2) all floor drains are to be covered. As required by ARNG DG 415-1, App. A, 4-5, an approved, hand-held ABC–type fire extinguisher was not present.

(6) Interlock. Ranges should be designed to afford maximum protection against lead exposure by interlocking the supply air louvers (non-powered system), and exhaust ventilation system. The MUA unit activated when the exhaust fan was turned on. Thus, the ventilation system meets the criterion, as required by NGR 385-15 (reference 2). The purpose of an interlock is to ensure that the ventilation system is activated during firing and range cleanup to help minimize unnecessary lead exposure.

(7) Target Positions. Manual target holders were mounted on a track that starts at the firing line and continues to the bullet trap and meets the criterion in the US Army Corps of Engineers Design Guidance (CEHND) 1110-1-18 (reference 6). The target retrieval system in Lane #1 was inoperable. NGR 385-15 2-2e(1)(a) (reference 2) requires that any firing lane without an operable retrieval system not be used. Partitions were not provided to separate the firing positions. These partitions are necessary to prevent the hot, spent cartridges from one position striking the firer in the adjacent position. Additionally, they minimize turbulent airflow, thereby assisting in moving lead containing contaminants downrange (CEHND 1110-1-18).

(8) Range Lighting. The lighting immediately forward of the firing line was not baffled, as required by NGR 385-15, 2-2c(1)(c) (reference 2), which requires that all range lighting be baffled. In addition the exit light was not in working condition as required by NGR 385-15, 2-2c(1)(f). Dead space was noted beginning 10 ft from the firing line and ending 10 ft before the bullet trap; the average illumination was 4 footcandles in this area. Lighting on the target ranged from 26 to 30 footcandles on the targets and does not meet the criterion laid out in NGR

385-15, 2-2c(1)(b) that requires illumination of at least 100 footcandles on the targets and 30 footcandles in all other areas. Based on the criteria outlined in NGR 385-15 the range should be classified as UNSAFE FOR USE.

(9) Housekeeping. Appropriate housekeeping was not being conducted at the range, as specified by NGR 385-15, 4-4a and h (reference 2). Dust, fume, and mist respirators approved by NIOSH (National Institute of Occupational Safety and Health) are required for workers during cleanup procedures; other personal protective equipment (PPE) is required by NGR 385-15. A high efficiency particulate (HEPA) vacuum was not present, as required by NGR 385-15, 4-4e, or other alternate wet methods used for cleaning the range. The bullet trap catch trays were over ¾ full and require emptying. Contact the Delaware State Environmental Office for proper disposal instructions of the bullet catch trays IAW NGR 385-15 4-4i.

b. Ventilation.

(1) Ventilation Measurements. In order to determine compliance with established criteria (references 2 and 3) the average cross-sectional air velocities at the firing line was measured. Smoke testing at the firing line revealed airflow that was turbulent at the firing line and rolled high and slow past the firing line and eventually downrange. The turbulence was caused by the six gas-fired heaters that are behind the firing line and the lights immediately forward of the firing line that were not baffled. Visual observation revealed that smoke hung up on the heaters and lights and rolled back around the breathing zones. Installing a baffle in front of the heaters should mitigate the problem of air hanging up on the heaters and lights and also increase the air velocity along the breathing zones. Visual observation employing a smoke canister and utilization of a pitot tube manometer indicated that the range was maintained under negative pressure relative to adjacent areas, as required by NGR 385-15 (reference 2).

(2) Firing Line. The cross-sectional air velocities through the three firing line positions averaged from 39.7 to 66.6 feet per minute (fpm) with an overall average of 51 feet per minute (fpm). These values did not meet the recommended minimum of 50 fpm at the firing line at each individual firing lane position required by NGR 385-15, 2-2b(2)(a), (reference 2). Therefore the range should be classified as UNSAFE FOR USE based on NGR 385-15.

(3) Ventilation Inspection. Detailed inspections, as required by National Guard policy (reference 2), were not being conducted. A support team composed of Safety, Public Works, and Industrial Hygiene representatives should make such inspections. A detailed inspection using DA FORM 5688-R should be conducted annually within 45 days of the anniversary date of the last annual inspection.

c. Sampling Results and Range Information. The analytical results of personal and general area air sampling conducted during this study indicate that the exposures to airborne lead levels did not exceed current recommendations outlined in NGR 385-15, App. A (reference 2).

(1) Breathing Zone (BZ) Samples. Personal BZ air samples were collected from three firers and one range NCOIC. The results ranged from 0.005 to 0.04 mg/m^3 and can be seen in Appendix B of this report.

(2) General Area (GA) Samples. Three GA samples were collected from both the left and right sides behind the firing line located at the plenum wall, and outside the range door. The results showed an exposure that was below the limit of detection, <0.005 mg/m^3 and can be seen in Appendix B.

(3) Wipe Samples. Eleven samples were collected from various locations in the firing range, as well as by the range entrance. Although there are presently no occupational standards limiting the amount of surface lead contamination, the presence of these deposits implies that range ventilation, housekeeping, and decontamination procedures are not completely effective. An appreciable quantity of this substance on accessible exposed surfaces increases the risk of additional lead exposure due to possible ingestion and/or re-aerosolization of the deposited dust. Wipe sampling results are included in Appendix C, and indicate that the range is in need of cleaning following methods prescribed in NGR 385-15, (reference 2).

(4) Range Usage Determination. The Pigman Armory Range should be classified as UNSAFE FOR USE, as outlined in 6e(3), (5), (6), (7) and (8) of this report.

(5) Methods of Range Cleanup. Current cleaning requirements mandate the use of a high efficiency particulate air (HEPA) filtered vacuum or wet cleaning methods. Wash water contaminated with lead can be collected and allowed to

evaporate leaving lead deposits and/or sludge that should be disposed of in accordance with applicable Federal, State and local laws; consult the Environmental Branch, Delaware Army National Guard for further details. Currently the standard operating procedure (SOP), at the Pigman Armory reflects the guidance given in NGR 385-15, 4-4 (reference 2). However, there was no evidence that the range is being cleaned IAW either their SOP or NGR 385-15 after each use as required.

d. Administrative Programs and Procedures.

(1) Respiratory Protection Program. No respiratory protection (as mandated in references 1, 2, 4, 5, and 8) was available for use during cleanup at the range. Exposure monitoring of personnel performing range cleanup is needed to assess lead exposure potential and aid in determining the type of respiratory protection required. The establishment and implementation of a respiratory protection program that meets the criteria established by the above-cited references must accompany issuance of respiratory protection.

(2) Personal Protection. The appropriate hearing and eye protection devices were used by the firers during the firing session and were readily available for all visitors during the firing session.

(3) Medical Surveillance. No personnel had been identified to perform duties as range control officers or range custodian; therefore, no personnel were enrolled in an annual blood-lead monitoring program. This surveillance must be conducted for both assigned military and civilian personnel [NGR 385-15 (reference 2)].

(4) Range Signs. Appropriate signage prohibiting smoking and/or consumption of food and beverages in the range and instructing personnel to wash their hands before commencing these activities were present in the range.

(5) Standing Operating Procedures (SOPs). The 280TH Signal Battalion developed the Pigman Armory SOP in June 1993. The SOP reflects the guidance as recommended by NGR 385-15 (reference 2) but personnel using the range are not following the range SOP as evidenced by incomplete or non-existent range record logs, lack of medical supplies present during range operation, etc.

7. CONCLUSIONS. Subject to the conditions under which this study was conducted, the Pigman Armory, Seaford, Delaware, Indoor Firing Range was concluded to be UNSAFE FOR USE, according to Headquarters Department of the Army, National Guard Regulation 385-15 criteria (reference 2). These conclusions are based on the observations of an inoperable MUA fan motor, unbaffled lights and unbaffled conduit leading to the exhaust fan, deficiencies in firing line air velocities, and turbulent airflow along the firing line.

8. RECOMMENDATIONS.

a. Properly baffle the acoustical tile on the range walls, the conduit leading from the exhaust fan, and the lights immediately before the firing line IAW NGR 385-15 2-2a(2)(b) and 2-2c(1)(c) (reference 2) [see paragraph 6a(3) and (8), this report] (RAC 3).

b. Service/replace the motor on the MUA unit to bring it back into a serviceable condition [see paragraph 6a(4), this report] (RAC 3).

c. Install partitions at the firing line to separate each position to prevent hot brass being ejected onto firers in adjacent lanes IAW CEHND 1110-1-18 (reference 6) [see paragraph 6a(7), this report] (RAC 3).

d. Repair/replace the target retrieval system in Lane #1 to bring it into compliance with NGR 385-15 2-2e(1)(a) (reference 2) [see paragraph 6a(7), this report] (RAC 4).

e. Install additional range lighting to bring the average illumination of the range to 30 footcandles. Furthermore, install additional lighting at the target line to bring the average illumination to 100 footcandles on the target, and ensure all lighting is baffled properly IAW NGR 385-15 2-2c(1)(b) (reference 2) [see paragraph 6a(8), this report] (RAC 4).

f. Procure and use a HEPA vacuum system for routine cleaning of the range per USACE Design Manual for Indoor Firing Range [CEHND 1110-1-18 (reference 6)] [see paragraph 6a(9), this report] (RAC 4).

g. Contact the Delaware State Environmental Office for proper disposal instructions of the bullet trap catch IAW NGR 385-15 4-4 I (reference 2) [see paragraph 6a(9) of this report] (RAC 5).

h. Increase the amount of air across the firing line to bring it into compliance with NGR 385-15, 2-2(b)(3)(a) (reference 2) that requires a minimum of 50 fpm across the firing line at every position by increasing the amount of air drawn in from the MUA unit. The air exhausted will also have to be increased, while still keeping the range under negative pressure (10%). Contact state engineer for formulating scope of work for ventilation requirements [see paragraph 6b(2), this report] (RAC 3).

i. Although the air sampling results did not exceed HQDA standards [NGR 385-15 (reference 2)] for lead exposure, consideration should be given to removing or baffling the six gas-fired heaters in an attempt to minimize the turbulence they create. Alternative methods for heating the range could include heating the make up air prior to introducing it to the plenum area [see paragraph 6b(1), this report] (RAC 4).

j. Conduct detailed annual inspections, using DA FORM 5688-R, within forty-five days of the anniversary date of the last annual inspection [NGR 385-15 (reference 2)] [see paragraph 6b(3), this report] (No RAC Assigned).

k. Conduct ventilation measurements quarterly by a competent person to ensure no changes have occurred as far as smoke tests, velocities, and static pressure measurements are concerned IAW NGR 385-15, 3-3c (reference 2) [see paragraph 6b(3), this report] (No RAC Assigned).

l. Designate specific personnel as range officer, range non-commissioned officer, and range cleaning personnel, enroll them in an annual blood lead level monitoring program, and provide training in the proper procedures for cleaning the facility [29 CFR 1910.1025 (reference 1)] [see paragraph 6d(3), this report] (RAC 4).

m. Ensure personnel who are using the range are familiar with the current range SOP prior to usage. Track the range record log and maintain it for 40 years from the date of use or the duration of employment plus 20 years, whichever is longer, as prescribed in 29 CFR 1910.1025, App. C, Section I (reference 1) [see paragraph 6d(5), this report] (No RAC Assigned).

n. Cap sewer drain located in the range to prevent lead contaminated wash water from entering the sanitary sewer, IAW HQDA NGR, 385-15 2-2a(2)(c) (reference 2) [see paragraph 6d(5), this report] (RAC 4).

o. Secure the top of the plenum wall to the existing metal stud frame to prevent any bowing or flexing of the plenum wall IAW DG 415-1, App. A, 3-1d(4) (reference 10) [see paragraph 6e(5), this report] (RAC 4).

p. Provide, in a recessed cabinet located in the range, an approved hand held ABC–type fire extinguisher as required by ARNG, DG 415-1, App. A, 4-5 (reference10) [see paragraph 6a(5), this report] (RAC 4).

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9. ADDITIONAL ASSISTANCE. Additional direct support in the fields of pest management, pesticide risk management, water supply management, wastewater management, hazardous waste management, ergonomic evaluation, worksite hazards management, health care hazards management, sanitation and hygiene, and installation industrial hygiene management is available and may be requested from USACHPPM-North at DSN 923-6502/5281/6205 or commercial (301) 677-6502/5281/6205.

Non-Responsive

1LT, MS
Environmental Science Officer
Industrial Hygiene Division

APPROVED:

Non-Responsive

Chief, Industrial Hygiene Division

APPENDIX A

REFERENCES

1. Title 29, Code of Federal Regulations, Part 1910, 1999 revision, Occupational Safety and Health Standards, Occupational Safety and Health Administration.

2. Memorandum, Headquarters, Department of the Army Letter, National Guard Regulation 385-15 (Draft), 10 June 1998, Subject: Policy and Responsibilities for Inspection/Evaluation and Use of National Guard Indoor Firing Ranges.

3. Industrial Ventilation, A Manual of Recommended Practice, 23rd Edition, American Conference of Governmental Industrial Hygienists, Cincinnati, Ohio, 1997.

4. United States Army Center for Health Promotion and Preventive Medicine Technical Guide 141, November 1997, Industrial Hygiene Sampling Instructions.

5. Department of Defense Instruction 6055.1, 19 August 1998, Department of Defense Occupational Safety and Health (OSH) Program.

6. US Army Corps of Engineers Design Manual for Indoor Firing Range, June 1990, CEHND 1110-1-18.

7. American National Standard (ANSI) Z87.1-1998, Practice for Occupational and Educational Eye and Face Protection, April 1998, American National Standards Institute, New York, New York.

8 Army Regulation 11-34, 15 February 1990, The Army Respiratory Protection Program.

9. Technical Mediçal Bulletin 502, 15 February 1982, Occupational and Environmental Health, Respiratory Protection Program.

10. Army National Guard (ARNG) Design Guide (DG) 415-1 Design Guide for Armories.

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APPENDIX B

ANALYTICAL RESULTS

Table. Results of Analysis of Air Samples Collected at the Indoor Firing Range, Pigman Armory, Seaford Delaware, 16 September 1999, for Inorganic Lead.

Sample #	Location	*BZ/GA	Results (mg/m^3)	TWAs (mg/m^3)
S1	Firing Position 1	BZ	0.02	0.0032
S2	Firing Position 2	BZ	0.01	0.0016
S3	Firing Position 3	BZ	0.04	0.0064
S4	Range NCOIC	BZ	0.005	0.0008
S5	At Plenum Wall, Right Side, Behind Lane #3	GA	0.005	0.0008
S6	Outside Range Door	GA	0.005	0.0008
S7	At Plenum Wall, Left Side, Behind Lane #1	GA	0.005	0.0008
S8	Blank	-	-	-

*BZ/GA = Breathing Zone Sample/General Area Sample
**$\mu g/m^3$ = Micrograms Per Cubic Meter of Air

See paragraph 6c(1) and (2), this report, for interpretation of these results.

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APPENDIX C

WIPE SAMPLING RESULTS

Table. Results of Analysis of Surface Wipe (Swipe) Samples at the Indoor Firing Range, Pigman Armory, Seaford Delaware, 16 September 1999, for Inorganic Lead.

Sample #	Location	Results ($\mu g/ft^2$)*
WS1	Floor, outside range door	9700
WS2	Range floor, lane #3, at firing line	5400
WS3	Range floor, at plenum wall, between lane #2 and #3	5300
WS4	Range floor, lane #2, centered, at firing line	4800
WS5	Range floor, at plenum wall, between lane #1 and #2	6100
WS6	Range floor, lane #3, centered, at firing line	2800
WS7	Range floor, centerline of lanes #2 and #3, 202'' from firing line	10000
WS8	Range floor, centerline of lanes #1 and #2, 202'' from firing line	18000
WS9	Range floor, front of bullet trap, lane #1	66000
WS10	Range floor, front of bullet trap, lane #2	51000
WS11	Range floor, front of bullet trap, lane #3	72000

*$\mu g/ft^2$ = Micrograms per Square Foot

See paragraph 6c(3), this report, for Interpretation of these results.

APPENDIX D

DERIVING RISK ASSESSMENT CODES (RACs) FOR HEALTH HAZARDS

STEP 1. HEALTH HAZARD SEVERITY CODE (HHSC). Using the following procedures to assess points, 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

AER POSSIBLE?	Exposure Conditions			
	< AL	Occasionally > AL Always < OEL	> AL < = OEL	> OEL
NO	0	3	5	7
YES	1-2	4	6	8

AER = Alternate exposure route, such as skin absorption, ingestion.
AL = Action level, DoD component threshold that triggers surveillance actions, such as microWatts/cm^2, dB, parts per million.
OEL = Occupational Exposure Limit, DoD exposure limit, such as Threshold Limit Value and Permissible Exposure Limit.

B. Medical Effects Points Assessed.

Condition	Points
No medical effect, 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, non-severe illness or loss of capacity, such as permanent hearing loss	5-6
Permanent, severe, disabling irreversible illness or death, such as asbestosis and lung cancer	7-8

C. Determine the HHSC by totaling the points assessed and using the following guide:

Total Points (sum of A and B, above)	HHSC
13-16	I
9-12	II
5-8	III
0-4	IV

STEP 2. ILLNESS PROBABILITY CODE (ICP). Using the following guides to assess points, determine the IPC for health hazards. The IPC is a function of the duration of exposure and the number of exposed personnel.

A. Duration of Exposure Points Assessed

Type of Exposure	Exposure Duration		
	1-8 hr/wk	>8hr/wk, not continuous	continuous
Irregular, intermittent	1-2	4-6	-
Regular, periodic	2-3	5-7	8

B. Number of Exposed Personnel Points Assessed

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

C. Determine the IPC for health hazards by totaling the points assessed and using the following guide:

Total Points (sum of A and B, above)	IPC
14-16	A
10-13	B
5-9	C
<5	D

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STEP 3. Determine the RAC for health hazards by using the following matrix to measure health hazard severity and mishap probability factors.

HEALTH HAZARD SEVERITY CODE	ILLNESS PROBABILITY CODE			
	A	B	C	D
I	1	1	2	3
II	1	2	3	4
III	2	3	4	5
IV	3	4	5	5

From Table 2 to Department of Defense Instruction 6055.1,
Department of Defense Occupational Safety and Health Program, 1 August 1997.

RAC DESCRIPTOR

RAC	DESCRIPTOR
1	CRITICAL
2	SERIOUS
3	MODERATE
4	MINOR
5	NEGLIGIBLE

NATIONAL GUARD BUREAU
ARMY NATIONAL GUARD
301-IH OLD BAY LANE
HAVRE de GRACE, MD 21078-4094

NGB-AVN-SI (40-5f) 15 September 1999

MEMORANDUM FOR The DEARNG Safety and Occupational Health Office

SUBJECT: Observations at the CSMS

1. General. ARNG Regional Industrial Hygienist, Ms. Non-Responsive and LTC Non-Responsive, DEARNG Occupational Health Manager (OHM) collected breathing zone (BZ) air sample during simulation of brake replacement/repair operations. The sampling was conducted on 8 individuals who were using a wet method to remove the brake pads. Sample results will be forwarded as soon as they become available. While air sampling was being conducted, a walk through survey of the facilities was conducted. This evaluation took place 9 Sep 99.

2. Observations at the CSMS:

a. Paint Preparation Area.

(1) The painter was observed sanding a vehicle prior to painting. The painter was using a hand held sander. However, this Nilfisk ™ sander is designed to capture particulates by exhausting the heavy metals through holes in the sander to a High Efficiency Particulate Air (HEPA) filtered vacuum system. Thus the metal dust is evacuated at the source rather than spreading to the adjacent environment. For the sander to operate properly, holes must be punched into the sandpaper at the points where the holes in the sander are. This was not done and allowed heavy metals to be distributed throughout the work bay. In addition, the hose to transport the dust particles to the HEPA vacuum system has been cut in two. This is a poor work practice and defeats the purpose of the design of the sander and containment system. It also exposes the operator of the sander unnecessarily and other personnel walking through or working in this area.

(2) Recommendation. Repair or replace the exhaust line from the sander to the HEPA vacuum system. Educate the painter as to the purpose of needing to use the containment system. Also, educate the painter on the purpose of punching holes in the sandpaper so that the sander can be used as designed.

b. Commercial Utility Combat Vehicle (CUC-V).

(1) Beware of the sand colored brake linings procured through the NSN system or local purchase. Surface wipe samples have indicated that new brake linings may have as much as 16 billion asbestos fibers per square foot of surface area. Some boxes do not indicate that the brakes contain asbestos. It is prudent to assume that all CUC-V brake linings are covered in asbestos fibers prior to placing them on the vehicle.

(2) Recommendation. Boxes of brake linings should be placed in a plastic bag prior to storage. When personnel need the brakes, they should punch a hole through the plastic bag and box and allow a stream of water to at least wet the pads before opening the bag/box. As long as the pads are wet, asbestos fibers can not become airborne. Treat the bag and box as hazardous waste. Place the excess water into a plastic 55-gallon drum and allow the water to evaporate to approximately 6 inches. At this time, the water should be considered hazardous waste. Contact the DEARNG State Environmental Office for disposal procedures.

c. Water-Based Chemical Agent Resistant Coating (CARC) Paint.

(1) In TM 43-0139, Table B-7, the last two sets of listings identify water-based primers that are in the NSN system. At this time, water-based CARC paint has not been given a NSN number. However, in approximately 2 years it will be available. At this time, a Mr. Non-Responsive Experimental Products Program, Army Research Laboratory (ARL) does know of a vendor whose CARC paint has been tested on military vehicles and found to meet the requirements. If you are interested in procuring this water-based CARC paint, please call him at (410) 306-0690.

(2) Recommendation. Contact the aforementioned individual for additional information.

d. Water Filter above Water Fountain.

(1) This type of filter is usually made of a charcoal-based product. Charcoal tends to collect contaminants but can reach a saturation point much like your organic cartridges on air purifying respirators and is in need of replacement. There was no date on the filter to indicate when it was installed or how long the filter should last. If left too long, the charcoal-based filter may start growing harmful bacteria.

(2) Recommendation. Contact the company to find out how long the filter can be used before replacing it. Write a date on the casing of the filter and ensure that someone monitors the expiration date and replaces the filter as needed.

e. Wet Method for Brake Jobs.

(1) An observation was made that it was hard to manage the pouring water behind the brake drum with the watering can. This also allowed personnel to use more water than was necessary.

(2) Recommendation. In an effort to be more efficient, shop personnel suggested procuring pressurized applicators such as is used for application of pesticides. This would allow a minimal waste of water and permit a more direct nozzle flow to the areas needed wetting.

3. Contact the undersigned if additional information is needed regarding these issues at 410-942-0273.

Non-Responsive

Industrial Hygienist

NATIONAL GUARD BUREAU
ARMY NATIONAL GUARD
NORTH REGION INDUSTRIAL HYGIENE OFFICE
301-IH OLD BAY LANE
HAVRE DE GRACE MD 21078

ARNG-CSG-P

3 July 2013

MEMORANDUM FOR Non-Responsive, Occupational Health Nurse, Delaware Army National Guard, First Regiment Road, Wilmington, DE 19808

SUBJECT: Executive Summary (EXSUM) for the Industrial Hygiene Wipe Sampling Survey in the former Indoor Firing Range at the Readiness Center in Seaford, DE on 25 June 2013.

1. PURPOSE. The purpose of this Industrial Hygiene (IH) survey was to evaluate the progress of the decontamination and conversion project at the former indoor firing range (IFR) in the Seaford Readiness Center in Delaware.

2. CONCLUSION. The floor in the Seaford Readiness Center's former IFR is still contaminated with lead and needs to be cleaned again. Efforts should be concentrated on the far end (where the former bullet trap was installed).

3. RECOMMENDATIONS.

a. Decontamination Requirements. Re-clean the floor area and decontaminate in accordance with guidance in NG Pam 420-15. **(RAC 3)** (NG Pam 420-15, reference 1)

b. Dust Removal. Wipe down the radiant heaters and the locker tops to remove any remaining lead and/or dust. **(RAC 4)** (NG Pam 420-15, reference 1)

c. Additional Sampling. Collect more wipe samples once the re-cleaning is completed. **(RAC 4)** (NG Pam 420-15, reference 1)

d. Limited Access. Continue to limit access to the former IFR area to personnel involved in the decontamination/conversion operation. **(RAC 4)** (NG PAM 420-15, reference 1)

e. Encapsulation. When re-sampling verifies that lead levels are below 200 µg/ft2, coat the walls will a sealant to encapsulate any remaining lead dust. Seal the concrete floors with deck enamel and then tile or cover with linoleum. **(RAC 4)** (NG PAM 420-15, reference 1)

4. ADDITIONAL ASSISTANCE. I am point of contact for this information and can be reached by phone at Non-Responsive or email at Non-Responsive

Non-Responsive
Regional Industrial Hygienist

NATIONAL GUARD BUREAU
ARMY NATIONAL GUARD
NORTH REGION INDUSTRIAL HYGIENE OFFICE
301-IH OLD BAY LANE
HAVRE DE GRACE MD 21078

INDUSTRIAL HYGIENE SURVEY
SURFACE WIPE SAMPLING FOR LEAD
FORMER INDOOR FIRING RANGE
SEAFORD, DE – 25 JUNE 2013

1. REFERENCES. See Appendix A.

2. PURPOSE. The purpose of this Industrial Hygiene (IH) survey was to evaluate the progress of the decontamination and conversion project at the former indoor firing range (IFR) in the Seaford Readiness Center in Delaware.

3. GENERAL.

a. Background.

(1) The Delaware Army National Guard (DEARNG) Facilities Management office initiated a project to decontaminate and convert former IFRs in multiple facilities throughout the state.

(2) A contractor was hired to manage the project and was responsible for the oversight of the cleaning, decontamination, and conversion of each former IFR. The contractor then subcontracted with an independent firm to verify any remaining lead levels were below the 200 micrograms per square foot ($\mu g/ft^2$) limit as published in National Guard Pamphlet (NG PAM) 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges (reference 1).

(3) Once the contractor reported all facilities were below the 200 $\mu g/ft^2$ limit, the Army National Guard (ARNG) North Region Industrial Hygiene (IH) office's assistance was requested in order to verify the contractor's reports.

b. Survey Personnel. This survey was conducted on 25 June 2013 by:

(1) Non-Responsive, Industrial Hygienist, ARNG North Region IH office

(2) Non-Responsive, IH Technician (Contractor), ARNG North Region IH office

(3) Non-Responsive, Occupational Health Nurse for the DEARNG.

c. Risk Assessment Codes (RACs). RACs are assigned to recommendations to help quantify risks to personnel and to aid in the establishment of funding priorities for corrective actions. Health RACs are determined by using the RAC table from the Department of Defense Instruction (DODI) 6055.1 (reference 2). This table is provided in Appendix B of this report.

4. METHODOLOGY.

a. Assessment Criteria.

(1) The United States Army, through DODI 6055.1, Section E3.4.1.2, directs that facilities provide healthful work environments in accordance with the most stringent standards applicable (reference 2).

(2) The Occupational Safety and Health Administration (OSHA), through the Code of Federal Regulations, have enforceable regulatory standards for workplace safety (reference 3).

(3) Department of the Army Pamphlet (DA PAM) 40-503, Industrial Hygiene Program, section 1-8, states that Army occupational exposure criteria will be based on the more stringent of standards published by OSHA as Permissible Exposure Limits (PELs), guidance from the American Conference of Governmental Industrial Hygienists (ACGIH) as Threshold Limit Values (TLVs), military unique standards or published guidance from other organizations when the primary standards are not applicable (references 4 and 5).

(4) In areas containing former IFRs, NG PAM 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, is used to determine satisfactory levels of any lead present in dust (reference 1).

(5) In areas not part of a former IFR (e.g. the drill hall adjacent to the former IFR), Department of Defense (DoD) Directive-Type Memorandum (DTM) 12-003, Control and Management of Surface Accumulations from Lead, Hexavalent Chromium, an Cadmium Operations, requires that surfaces are maintained as free as practicable of accumulations of lead (reference 6).

(6) When children are present, we refer to Title 24 of the Code of Federal Regulations, Part 35.1320, Lead-based paint inspections, paint testing, risk assessments, lead-hazard screens, and reevaluations (reference 7). This Housing and Urban Development (HUD) regulation lists a clearance level, specific to floors, of 40 $\mu g/ft^2$, in the table in section 35.1320(b)(2) and is used to determine if the dwelling unit, worksite or common area passes or fails the clearance test.

b. Wipe Sampling Protocol.

(1) Procedures. Surface wipe sampling methods were conducted in accordance with NG PAM 420-15 and OSHA's Technical Manual, 5th edition (references 1 and 8).

(2) Media. Ghost Wipes were used for sample collection and were placed in 68mL HotBlock digestion vessels. Templates (10 cm x 10 cm) were used to ensure uniform wipe area.

(3) Lab Analysis. All samples were sent to Aerosol Monitoring & Analysis (AMA) Analytical Services, Inc., an American Industrial Hygiene Association (AIHA) accredited

laboratory in Lanham, Maryland. The samples were analyzed using the Environmental Protection Agency (EPA) method 600/R-93/200(M)-7000B for Lead (reference 9) (see Appendix E).

5. FINDINGS AND DISCUSSION.

a. General Information. Prior to this visit, the contractor reported the former IFR was cleaned and all samples were below the 200 $\mu g/ft^2$ limit. The bullet trap, plenum components, baffles, soundproofing and firing points were removed. The radiant heaters and control box were left in place. Single lockers were also present.

b. Wipe Sampling. Surface wipe samples were collected in accordance with the guidance provided in NG Pam 420-15. Sample information is presented in Appendices C and D of this report.

c. Results. Out of 18 samples collected, 4 tested positive for lead, with only 2 of the 4 reported above 200 $\mu g/ft^2$, and only 1 of those 2 above 1,000 $\mu g/ft^2$. Complete surface wipe sample results are provided in Appendix C of this report.

d. Lockers. One sample was collected from the top of a locker inside the range. The sample result from the locker top was reported as below detectable limits for lead. While not positive for lead, all of the locker tops were very dusty and should be wiped down.

6. CONCLUSION. The floor in the Seaford Readiness Center's former IFR is still contaminated with lead and needs to be cleaned again. Efforts should be concentrated on the far end (where the former bullet trap was installed).

7. RECOMMENDATIONS.

a. Decontamination Requirements. Re-clean the floor area and decontaminate in accordance with guidance in NG Pam 420-15. **(RAC 3)** (NG Pam 420-15, reference 1)

b. Dust Removal. Wipe down the radiant heaters and the locker tops to remove any remaining lead and/or dust. **(RAC 4)** (NG Pam 420-15, reference 1)

c. Additional Sampling. Collect more wipe samples once the re-cleaning is completed. **(RAC 4)** (NG Pam 420-15, reference 1)

d. Limited Access. Continue to limit access to the former IFR area to personnel involved in the decontamination/conversion operation. **(RAC 4)** (NG PAM 420-15, reference 1)

e. Encapsulation. When re-sampling verifies that lead levels are below 200 µg/ft2, coat the walls will a sealant to encapsulate any remaining lead dust. Seal the concrete floors with deck enamel and then tile or cover with linoleum. **(RAC 4)** (NG PAM 420-15, reference 1)

ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Seaford Readiness Center, Seaford, DE, 25 June 2013

8. ADDITIONAL ASSISTANCE. I am point of contact for this information and can be reached by phone at Non-Responsive or email at Non-Responsive

Non-Responsive
Regional Industrial Hygienist

APPENDIX – A
REFERENCES

1. National Guard Pamphlet (NG PAM) 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 November 2006.

2. Department of Defense Instruction (DODI) 6055.1, Department of Defense (DOD) Safety and Occupational Health (SOH) Program, 19 August 1998.

3. Title 29 Code of Federal Regulations, Part 1910.1025, Lead, Occupational Safety and Health Administration (OSHA), 2013 Edition.

4. Department of the Army Pamphlet (DA PAM) 40-503, The Army Industrial Hygiene Program, 2 April 2013.

5. Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, 2013, American Conference of Governmental Industrial Hygienists, Cincinnati, OH.

6. Department of Defense (DoD) Directive-Type Memorandum (DTM) 12-003, Control and Management of Surface Accumulations from Lead, Hexavalent Chromium, and Cadmium Operations, 18 April 2012.

7. Title 24 Code of Federal Regulations, Part 35.1320, Lead-based paint inspections, paint testing, risk assessments, lead-hazard screens, and reevaluations, Housing and Urban Development (HUD), 2013 Edition.

8. Occupational Safety and Health Administration Technical Manual, TED 01-00-015 [TED 1-0.15A], 5th Edition.

9. Environmental Protection Agency (EPA) Method 600/R-93/200(M), Field Analysis of Lead in Paint, Bulk Dust, and Soil by Ultrasonic, Acid Digestion and Colorimetric Measurement, September 1993.

APPENDIX – B
DERIVING RISK ASSESSMENT CODES (RACs) FOR HEALTH HAZARDS

(Taken from Table 2 of DODI 6055.1 (reference 2))

1. HEALTH HAZARD SEVERITY CODE (HHSC). Using the following procedures to assess points, 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

AER Possible?	Exposure Conditions			
	<AL	Occasionally>AL Always<OEL	>AL <=OEL	>OEL
NO	0	3	5	7
YES	1-2	4	6	8

AER = Alternate exposure route, such as skin absorption, ingestion.
AL = Action level, DoD component threshold that triggers surveillance actions, such as microWatts/cm^2, dB, parts per million.
OEL = Occupational Exposure Limit, DoD exposure limit, such as Threshold Limit Value and Permissible Exposure Limit.

b. Medical Effects Points Assessed.

Condition	Points
No medical effect, 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, non-severe illness or loss of capacity, such as permanent hearing loss	5-6
Permanent, severe, disabling irreversible illness or death, such as asbestosis and lung cancer	7-8

ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Seaford Readiness Center, Seaford, DE, 25 June 2013

APPENDIX – B – CONTINUED
DERIVING RISK ASSESSMENT CODES (RACs) FOR HEALTH HAZARDS

c. Determine the HHSC by totaling the points assessed and using the following guide:

Total Points (sum of A and B, above)	HHSC
13-16	I
9-12	II
5-8	III
0-4	IV

2. ILLNESS PROBABILITY CODE (IPC). Using the following guides to assess points, determine the IPC for health hazards. The IPC is a function of the duration of exposure and the number of exposed personnel.

a. Duration of Exposure Points Assessed

Type of Exposure	Exposure Duration		
	1-8 hr/wk	>8hr/wk, not continuous	Continuous
Irregular, intermittent	1-2	4-6	-
Regular, periodic	2-3	5-7	8

b. Number of Exposed Personnel Points Assessed

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

ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Seaford Readiness Center, Seaford, DE, 25 June 2013

APPENDIX – B – CONTINUED
DERIVING RISK ASSESSMENT CODES (RACs) FOR HEALTH HAZARDS

c. Determine the IPC for health hazards by totaling the points assessed and using the following guide:

Total Points (sum of A and B, above)	IPC
14-16	A
10-13	B
5-9	C
<5	D

3. Determine the RAC for health hazards by using the following matrix to measure health hazard severity and mishap probability factors.

HEALTH HAZARD SEVERITY CODE	ILLNESS PROBABILITY CODE			
	A	B	C	D
I	1	1	2	3
II	1	2	3	4
III	2	3	4	5
IV	3	4	5	5

4. RAC DESCRIPTOR

RAC	DESCRIPTOR
1	CRITICAL
2	SERIOUS
3	MODERATE
4	MINOR
5	NEGLIGIBLE

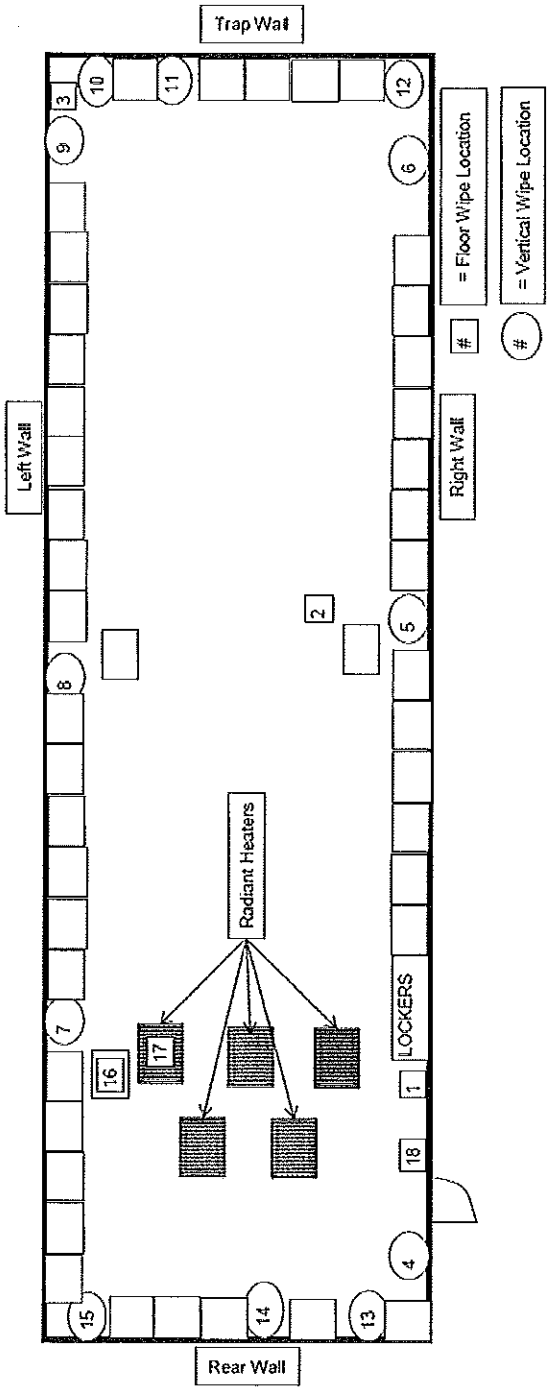
ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Seaford Readiness Center, Seaford, DE, 25 June 2013

APPENDIX – C
WIPE SAMPLE INFORMATION

				Distance From Wall:				
Sample Number	Result		Location	Trap	Rear	Left	Right	Vertical Position:
20130625 Seaford DE 01	< 110	µg/ft²	Floor		11 ft		1 ft	
20130625 Seaford DE 02	270	µg/ft²	Floor		22 ft		3 ft	
20130625 Seaford DE 03	2400	µg/ft²	Floor	2 ft		6 in		
20130625 Seaford DE 04	< 110	µg/ft²	Wall, Right		4 ft			6 ft from floor
20130625 Seaford DE 05	< 110	µg/ft²	Wall, Right		26 ft			3 ft from floor
20130625 Seaford DE 06	< 110	µg/ft²	Wall, Right	4 ft				1 ft from floor
20130625 Seaford DE 07	< 110	µg/ft²	Wall, Left		13 ft			3 ft from floor
20130625 Seaford DE 08	< 110	µg/ft²	Wall, Left		31 ft			6 ft from floor
20130625 Seaford DE 09	< 110	µg/ft²	Wall, Left	3 ft				3 ft from floor
20130625 Seaford DE 10	< 110	µg/ft²	Wall, Trap			6 in		1 ft from floor
20130625 Seaford DE 11	< 110	µg/ft²	Wall, Trap			6 ft		6 ft from floor
20130625 Seaford DE 12	< 110	µg/ft²	Wall, Trap				6 in	3 ft from floor
20130625 Seaford DE 13	110	µg/ft²	Wall, Rear				4 ft	6 ft from floor
20130625 Seaford DE 14	< 110	µg/ft²	Wall, Rear				9 ft	3 ft from floor
20130625 Seaford DE 15	< 110	µg/ft²	Wall, Rear			2 ft		1 ft from floor
20130625 Seaford DE 16	< 110	µg/ft²	Locker Top	Locker top, along left wall, 7th locker from rear wall				
20130625 Seaford DE 17	130	µg/ft²	Heater	Heater top, closest to left wall, row closest to trap				
20130625 Seaford DE 18	< 110	µg/ft²	Control Box	Control box top by entry door				
20130625 Seaford DE 19	< 12	µg	BLANK					
20130625 Seaford DE 20	< 12	µg	BLANK					

ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Seaford Readiness Center, Seaford, DE, 25 June 2013

APPENDIX – D
WIPE SAMPLE LOCATIONS



ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Seaford Readiness Center, Seaford, DE, 25 June 2013

APPENDIX – E
LABORATORY RESULTS

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	Job Name:	Delaware IFR Lead Clearance	Chain Of Custody:	516207
Address:	301-4H Old Bay Lane, Attn: ARNG-CSG-P, State Military Reservation	Job Location:	Seaford, DE	Date Submitted:	6/27/2013
	Havre de Grace, Maryland 21078	Job Number:	Not Provided	Person Submitting:	[redacted]
		P.O. Number:	W912K6-09-A-0003	Date Analyzed:	6/28/2013
Attention:	[redacted]			Report Date:	7/1/2013

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
13073818	20130625 Seaford DE 01	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073819	20130625 Seaford DE 02	Flame	Wipe	****	0.111	110	ug/ft²	30	270	ug/ft²	
13073820	20130625 Seaford DE 03	Flame	Wipe	****	0.111	110	ug/ft²	260	2400	ug/ft²	
13073821	20130625 Seaford DE 04	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073822	20130625 Seaford DE 05	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073823	20130625 Seaford DE 06	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073824	20130625 Seaford DE 07	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073825	20130625 Seaford DE 08	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073826	20130625 Seaford DE 09	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073827	20130625 Seaford DE 10	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073828	20130625 Seaford DE 11	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	

An AIHA (#101459) and NY ELAP (#10920) Accredited Laboratory
4525 Forbes Blvd. • Lanham, MD, 20706 • (301) 459-2640 • Toll Free (800) 346-0961 • Fax (301) 459-2643

ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Seaford Readiness Center, Seaford, DE, 25 June 2013

APPENDIX – E – CONTINUED
LABORATORY RESULTS

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

AIHA LAP, LLC ACCREDITED LABORATORY

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	Job Name:	Delaware IFR Lead Clearance	Chain Of Custody:	516207
Address:	301-IH Old Boy Lane, Attn: ARNG-CSG-P, State Military Reservation Havre de Grace, Maryland 21078	Job Location:	Seaford, DE	Date Submitted:	6/27/2013
		Job Number:	Not Provided	Person Submitting:	[redacted]
		P.O. Number:	W912K6-09-A-0003	Date Analyzed:	6/28/2013 Report Date: 7/1/2013
Attention:	[redacted]				

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
13073829	20130625 Seaford DE 12	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073830	20130625 Seaford DE 13	Flame	Wipe	****	0.111	110	ug/ft²	13	110	ug/ft²	
13073831	20130625 Seaford DE 14	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073832	20130625 Seaford DE 15	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073833	20130625 Seaford DE 16	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073834	20130625 Seaford DE 17	Flame	Wipe	****	0.111	110	ug/ft²	15	130	ug/ft²	
13073835	20130625 Seaford DE 18	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13073836	20130625 Seaford DE 19	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	
13073837	20130625 Seaford DE 20	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	

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ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Seaford Readiness Center, Seaford, DE, 25 June 2013

APPENDIX – E – CONTINUED
LABORATORY RESULTS

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

AMA LAP, LLC
ACCREDITED LABORATORY

CERTIFICATE OF ANALYSIS

Client: National Guard Bureau
Address: 301-HC Old Bay Lane, Attn: ARNG-CSG-P, State Military Reservation
Havre de Grace, Maryland 21078
Attention: [redacted]

Job Name: Delaware IFR Lead Clearance
Job Location: Seaford, DE
Job Number: Not Provided
P.O. Number: W912K6-09-A-0003

Chain Of Custody: 516207
Date Submitted: 6/27/2013
Person Submitting: [redacted]
Date Analyzed: 6/28/2013
Report Date: 7/1/2013

Summary of Atomic Absorption Analysis for Lead

Page 3 of 5

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit	Total ug	Final Result	Comments
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B
N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)
%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)
Note: All samples were received in good condition unless otherwise noted.
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

See QC Summary for analytical results of quality control samples associated with these samples.

Air and Wipe results are not corrected for any blank results
Final results for air and wipe samples are based on client supplied information not verified by this laboratory.
All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

Non-Responsive

Analyst: [redacted] Technical Manager: [redacted]

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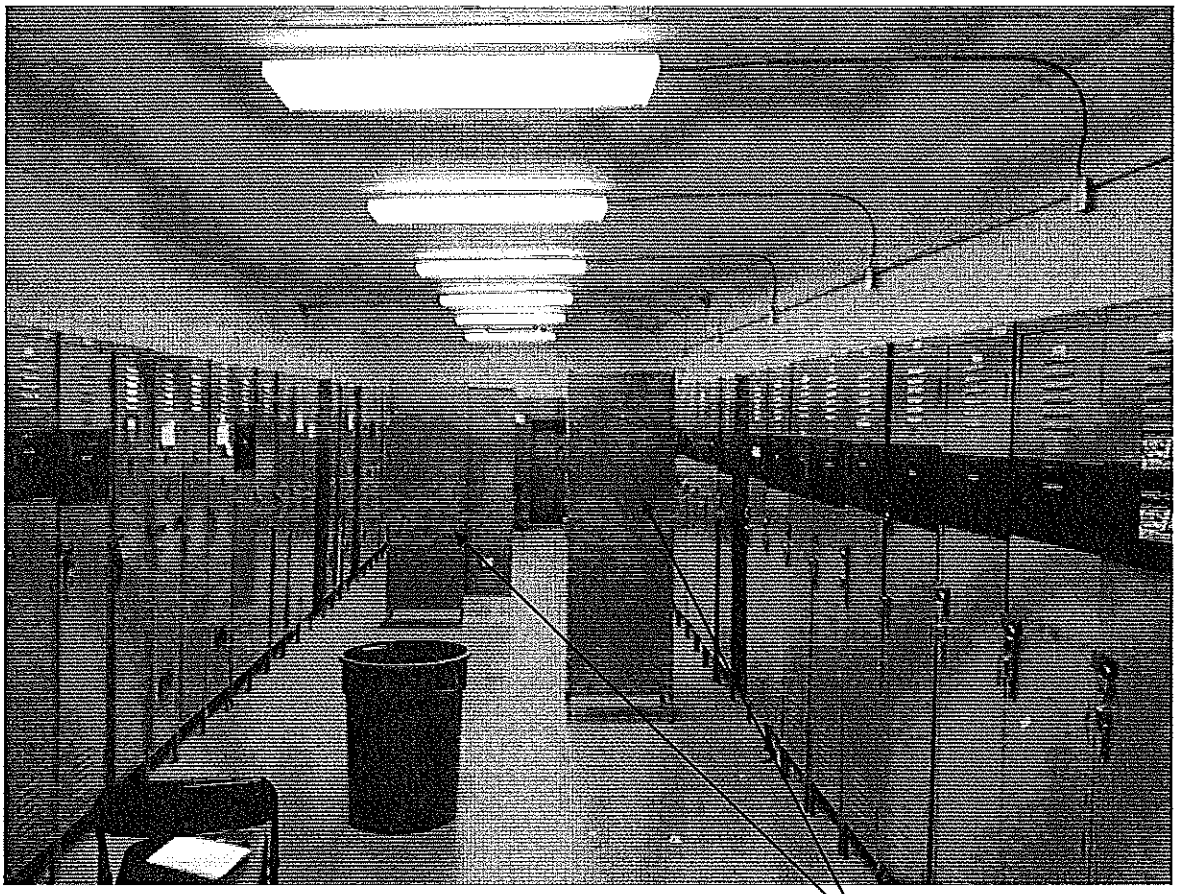
APPENDIX – F
PHOTOGRAPHS

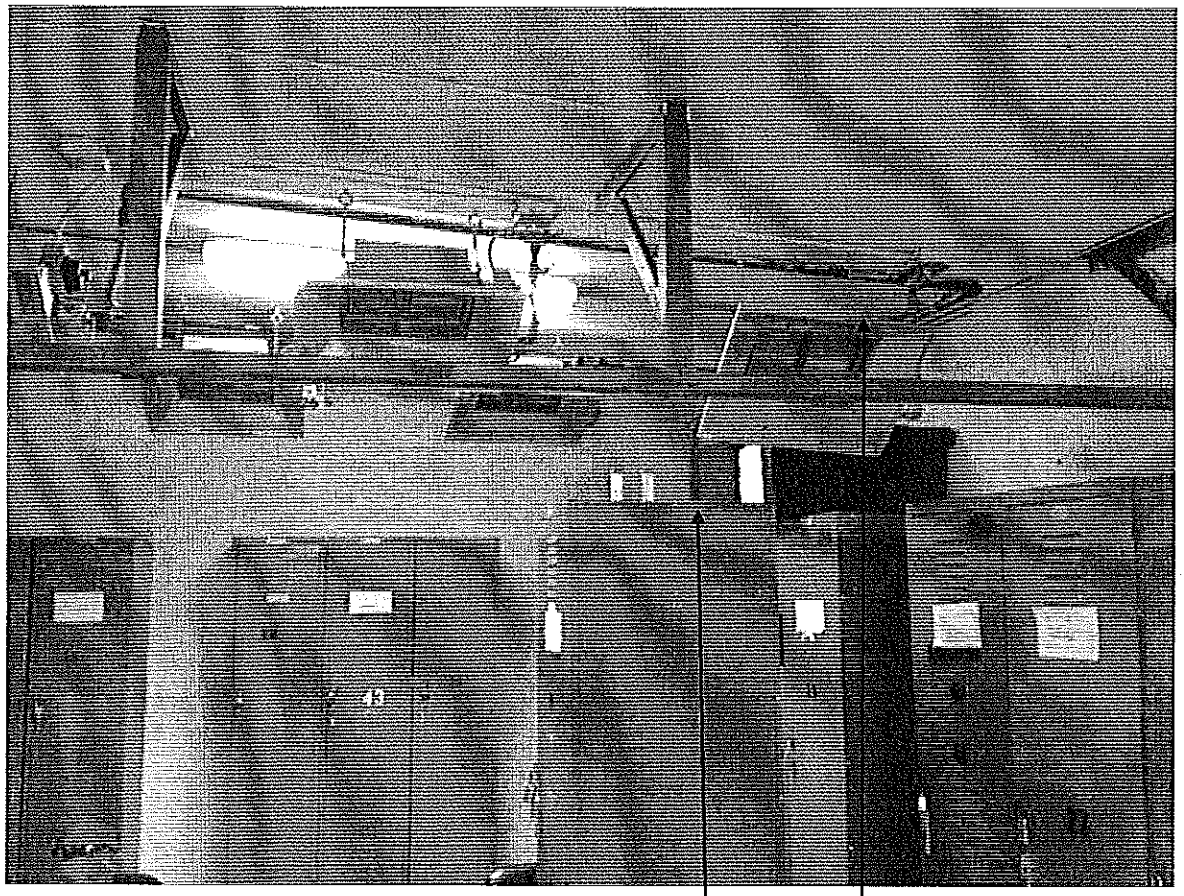
Picture 1:



View looking toward "trap" wall from back wall/entry door area. The out-of-place lockers were moved in order to sample the walls behind them.

APPENDIX – F – CONTINUED
PHOTOGRAPHS

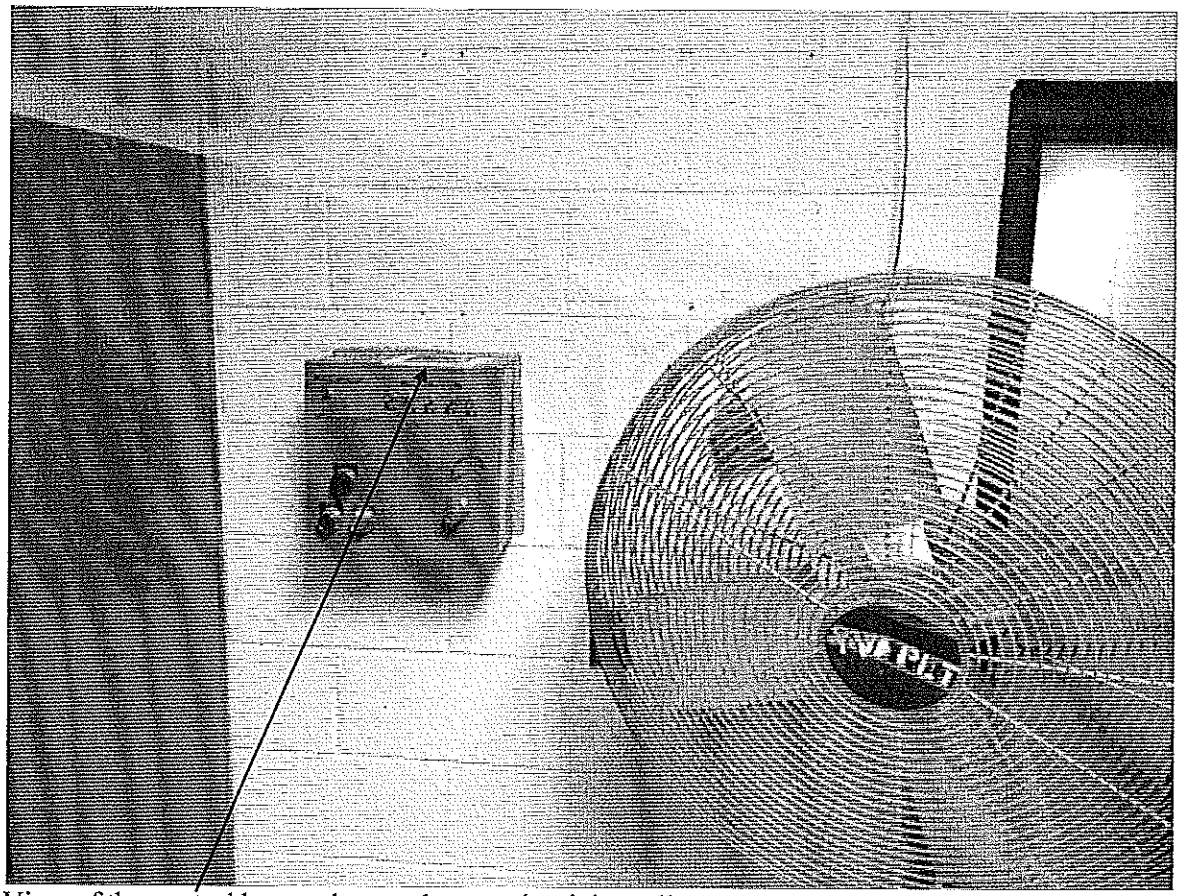
Picture 2:



View of the back wall. Samples were taken from this locker top and heater.

APPENDIX – F – CONTINUED
PHOTOGRAPHS

Picture 3:



View of the control box and entry door on the right wall.

NATIONAL GUARD BUREAU
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NORTHEAST REGION INDUSTRIAL HYGIENE OFFICE
301-IH OLD BAY LANE
HAVRE DE GRACE MD 21078

INDUSTRIAL HYGIENE SURVEY
SURFACE WIPE SAMPLING FOR LEAD
FORMER INDOOR FIRING RANGE
SEAFORD, DE – 30 SEPTEMBER 2013

1. REFERENCES. See Appendix A.

2. PURPOSE. The purpose of this Industrial Hygiene (IH) survey was to reevaluate the progress of the decontamination and conversion project at the former indoor firing range (IFR) in the Seaford Readiness Center, 601 Bridgeville Rd, Seaford, Delaware.

3. GENERAL.

a. Background.

(1) The Delaware Army National Guard (DEARNG) Facilities Management office initiated a project to decontaminate and convert former IFRs in multiple facilities throughout the state.

(2) A contractor was hired to manage the project and was responsible for the oversight of the cleaning, decontamination, and conversion of each former IFR. The contractor then subcontracted with an independent firm to verify any remaining lead levels were below the 200 micrograms per square foot ($\mu g/ft^2$) limit as published in National Guard Pamphlet (NG PAM) 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges (reference 1).

(3) Once the contractor reported all facilities were below the 200 $\mu g/ft^2$ limit, the Army National Guard (ARNG) North Region Industrial Hygiene (IH) office's assistance was requested in order to verify the contractor's reports. These sample results and locations are listed in Appendices C and D of this report.

(4) Upon review of the laboratory results, it was determined that some locations in this former IFR were still above the 200 $\mu g/ft^2$ limit. The DEARNG Facilities Management office, in consultation with the Occupational Health Nurse and the North Region IH office, brought the contractor back to clean the affected areas.

b. Survey Personnel. This survey was conducted on 30 September 2013 by Non-Responsive, Industrial Hygienist, ARNG Midwest Region IH office.

c. Risk Assessment Codes (RACs). RACs are assigned to recommendations to help quantify risks to personnel and to aid in the establishment of funding priorities for corrective actions. Health RACs are determined by using the RAC table from the Department of Defense Instruction (DODI) 6055.1 (reference 2).

4. METHODOLOGY.

a. Assessment Criteria.

(1) The United States Army, through DODI 6055.1, Section E3.4.1.2, directs that facilities provide healthful work environments in accordance with the most stringent standards applicable (reference 2).

(2) The Occupational Safety and Health Administration (OSHA), through the Code of Federal Regulations, have enforceable regulatory standards for workplace safety (reference 3).

(3) Department of the Army Pamphlet (DA PAM) 40-503, Industrial Hygiene Program, section 1-8, states that Army occupational exposure criteria will be based on the more stringent of standards published by OSHA as Permissible Exposure Limits (PELs), guidance from the American Conference of Governmental Industrial Hygienists (ACGIH) as Threshold Limit Values (TLVs), military unique standards or published guidance from other organizations when the primary standards are not applicable (references 4 and 5).

(4) In areas containing former IFRs, NG PAM 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, is used to determine satisfactory levels of any lead present in dust (reference 1).

b. Wipe Sampling Protocol.

(1) Procedures. Surface wipe sampling methods were conducted in accordance with NG PAM 420-15 and OSHA's Technical Manual, 5th edition (references 1 and 6).

(2) Media. Ghost Wipes were used for sample collection and were placed in 68mL HotBlock digestion vessels. Templates (10 cm x 10 cm) were used to ensure uniform wipe area.

(3) Lab Analysis. All samples were sent to Aerosol Monitoring & Analysis (AMA) Analytical Services, Inc., an American Industrial Hygiene Association (AIHA) accredited laboratory in Lanham, Maryland. The samples were analyzed using the Environmental Protection Agency (EPA) method 600/R-93/200(M)-7000B for Lead (reference 7) (see Appendix E).

5. FINDINGS AND DISCUSSION.

a. General Information. Prior to this visit, the contractor reported the former IFR was cleaned (2nd time) and all samples were below the 200 $\mu g/ft^2$ limit. The bullet trap, plenum components, baffles, soundproofing and firing points were removed. The radiant heaters and control box were left in place. Single lockers were also present.

b. Wipe Sampling. Surface wipe samples were collected in accordance with the guidance provided in NG Pam 420-15. Sample information is presented in Appendices B of this report.

c. Results. Out of 2 samples collected, both tested positive for lead and were reported above 200 µg/ft^2. Neither sample result was above 1,000 µg/ft^2. Complete surface wipe sample results are provided in Appendix B of this report.

d. Lockers. One sample was collected from the top of a locker inside the range. The sample result from the locker top was reported as below detectable limits for lead. While not positive for lead, all of the locker tops were very dusty and should be wiped down.

6. CONCLUSION. The floor in the Seaford Readiness Center's former IFR is still contaminated with lead and needs to be cleaned again. Efforts should be concentrated on the far end (where the former bullet trap was installed).

7. RECOMMENDATIONS.

a. Decontamination Requirements. Re-clean the floor area and decontaminate in accordance with guidance in NG Pam 420-15. (**RAC 3**) (NG Pam 420-15, reference 1)

b. Dust Removal. Wipe down the radiant heaters and the locker tops to remove any remaining lead and/or dust. (**RAC 4**) (NG Pam 420-15, reference 1)

c. Additional Sampling. Collect more wipe samples once the re-cleaning is completed. (**RAC 4**) (NG Pam 420-15, reference 1)

d. Limited Access. Continue to limit access to the former IFR area to personnel involved in the decontamination/conversion operation. (**RAC 4**) (NG PAM 420-15, reference 1)

e. Encapsulation. When re-sampling verifies that lead levels are below 200 µg/ft2, coat the walls will a sealant to encapsulate any remaining lead dust. Seal the concrete floors with deck enamel and then tile or cover with linoleum. (**RAC 4**) (NG PAM 420-15, reference 1)

8. ADDITIONAL ASSISTANCE. I am point of contact for this information and can be reached by phone at Non-Responsive or email at Non-Responsive.

[redacted] Non-Responsive [redacted]
[redacted]
Regional Industrial Hygienist

APPENDIX – A
REFERENCES

1. National Guard Pamphlet (NG PAM) 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 November 2006.

2. Department of Defense Instruction (DODI) 6055.1, Department of Defense (DOD) Safety and Occupational Health (SOH) Program, 19 August 1998.

3. Title 29 Code of Federal Regulations, Part 1910.1025, Lead, Occupational Safety and Health Administration (OSHA), 2013 Edition.

4. Department of the Army Pamphlet (DA PAM) 40-503, The Army Industrial Hygiene Program, 2 April 2013.

5. Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, 2013, American Conference of Governmental Industrial Hygienists, Cincinnati, OH.

6. Occupational Safety and Health Administration Technical Manual, TED 01-00-015 [TED 1-0.15A], 5th Edition.

7. Environmental Protection Agency (EPA) Method 600/R-93/200(M), Field Analysis of Lead in Paint, Bulk Dust, and Soil by Ultrasonic, Acid Digestion and Colorimetric Measurement, September 1993.

APPENDIX – B
WIPE SAMPLE INFORMATION

Sample Number	*Result*		*Location*
20130930 SC01	230	µg/ft^2	Floor, Middle of Room
20130930 SC02	480	µg/ft^2	Floor, Near Trap Wall
20130926 SC07	< 12	µg	BLANK

ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Seaford Readiness Center, Seaford, DE, 30 September 2013

APPENDIX – C
ORIGINAL WIPE SAMPLE INFORMATION

					Distance From Wall:				
Sample Number	**Result**			**Location**	**Trap**	**Rear**	**Left**	**Right**	**Vertical Position:**
20130625 Seaford DE 01	<	110	µg/ft²	Floor		11 ft		1 ft	
20130625 Seaford DE 02		**270**	**µg/ft²**	**Floor**		**22 ft**		**3 ft**	
20130625 Seaford DE 03		**2400**	**µg/ft²**	**Floor**	**2 ft**		**6 in**		
20130625 Seaford DE 04	<	110	µg/ft²	Wall, Right		4 ft			6 ft from floor
20130625 Seaford DE 05	<	110	µg/ft²	Wall, Right		26 ft			3 ft from floor
20130625 Seaford DE 06	<	110	µg/ft²	Wall, Right	4 ft				1 ft from floor
20130625 Seaford DE 07	<	110	µg/ft²	Wall, Left		13 ft			3 ft from floor
20130625 Seaford DE 08	<	110	µg/ft²	Wall, Left		31 ft			6 ft from floor
20130625 Seaford DE 09	<	110	µg/ft²	Wall, Left	3 ft				3 ft from floor
20130625 Seaford DE 10	<	110	µg/ft²	Wall, Trap			6 in		1 ft from floor
20130625 Seaford DE 11	<	110	µg/ft²	Wall, Trap			6 ft		6 ft from floor
20130625 Seaford DE 12	<	110	µg/ft²	Wall, Trap				6 in	3 ft from floor
20130625 Seaford DE 13		110	µg/ft²	Wall, Rear				4 ft	6 ft from floor
20130625 Seaford DE 14	<	110	µg/ft²	Wall, Rear				9 ft	3 ft from floor
20130625 Seaford DE 15	<	110	µg/ft²	Wall, Rear			2 ft		1 ft from floor
20130625 Seaford DE 16	<	110	µg/ft²	Locker Top	Locker top, along left wall, 7th locker from rear wall				
20130625 Seaford DE 17		130	µg/ft²	Heater	Heater top, closest to left wall, row closest to trap				
20130625 Seaford DE 18	<	110	µg/ft²	Control Box	Control box top by entry door				
20130625 Seaford DE 19	<	12	µg	BLANK					
20130625 Seaford DE 20	<	12	µg	BLANK					

APPENDIX – D
ORIGINAL WIPE SAMPLE LOCATIONS

ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Seaford Readiness Center, Seaford, DE, 30 September 2013

APPENDIX – E
LABORATORY RESULTS

Non-Responsive

Non-Responsive

Non-Responsive

Non-Responsive

Industrial Hygiene Survey Report

National Guard Facility
John H. Pigman Readiness Center

Prepared For:	**National Guard Bureau Region North IH** **301-IH Old Bay Lane** **Havre de Grace, MD 21078**
Survey Location:	**John H. Pigman Readiness Center** **601 Bridgeville Road** **Seaford, DE 19973**
Prepared By:	**ALS Environmental** **3544 North Progress Avenue** **Suite 100** **Harrisburg, PA 17110**
Survey Date:	**October 14, 2011**
Report Date:	**December 5, 2011**
ALS Project #:	**1110757**

Non-Responsive

Director, Industrial Hygiene Services

Table of Contents

Section 1.0
Executive Summary

Section 1.0 Executive Summary

An industrial hygiene survey was conducted on October 14, 2011, at the John H. Pigman Readiness Center located at 601 Bridgeville Road, Seaford, DE 19973. The survey was performed by Ms. Non-Responsive

1. Lead surface and air samples were collected. Surface levels of lead exceeded 200 micrograms per square foot (ug/ft^2) in five locations associated with the converted indoor firing range. Cleaning procedures should be improved and remedial action should be taken to maintain lead levels below 200 ug/ft^2. See Section 3.0 for sampling results.

2. Lighting levels did not meet the American National Standard Institute/Illuminating Engineering Society of North America (ANSI/IESNA) recommended guideline in some areas. See Section 4.0 for locations.

3. Indoor air quality (IAQ) parameters of temperature, relative humidity, carbon monoxide and carbon dioxide (ventilation) were evaluated during the assessment. Relative humidity levels in some areas were above The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation and Recommendation. Relative humidity should be maintained at 30 - 60%. See Section 5.0 for sample results. The heating, ventilating, and air conditioning system (HVAC) system should be inspected to ensure it is working properly.

4. Some water damaged ceiling tiles were observed throughout the facility. It was reported that the HVAC system condensates which causes damaged ceiling tiles. Effloresce was noted on the exterior wall in the dining room. Identify and repair all sources of water infiltration. Remove and replace all water stained ceiling tiles.

5. The HVAC supply and return grills located in some of the offices and classrooms were observed to be dirty. These should be cleaned. Do not permit dirt, debris, microbial growth, etc. to accumulate in any portion of the HVAC system.

Section 2.0
Operation Description & Observation

Section 2.0 Operation Description & Observations

The John H. Pigman Readiness Center is mainly an administrative facility with a drill hall, offices, classrooms and storage areas. There were approximately 5 full-time employees stationed at this facility at the time of this survey.

The building was initially constructed in 1950 with additions in 1960. The building is one story with a brick exterior. The interior walls are primarily concrete block and drywall. The floors are concrete with vinyl floor tile or carpet.

There is a central HVAC system present in the facility. HVAC units service the building via a boiler. Some offices have wall mounted or window mounted air conditioners. Supply and return grills were observed to be dirty.

The area of the building that was once a firing range has been converted into a locker room. No firing range components remain. The area appears very clean and well kept.

There is no child-care facility in the building.

Overall housekeeping practices were good. Areas were clean and well kept.

No ergonomic concerns were reported. Office areas have computer work stations. Work stations appeared properly designed. Personnel had supportive chairs.

Section 3.0
Lead Testing

Section 3.0 Lead Testing

Due to the age of the building there is the potential for lead based paint to be present. Various surfaces within the facility were screened for lead using surface/wipe samples. Surface/wipe samples were collected in accordance with the American Society for Testing and Materials (ASTM) E 1792 protocols. Air samples were collected using 0.8 um mixed cellulose ester (MCE) filter cassettes attached to low volume air sampling pumps. Blank samples were submitted to the laboratory for quality control purposes. Samples were sent to AMA Analytical Services, Inc., in Lanham, Maryland, for lead analysis using Environmental Protection Agency (EPA) Method 600/R-93/200 (M)-7420. A copy of the laboratory analysis report can be found in Appendix A.

Lead Testing Results Summary

Sample #	Location	Air ug/m^3	Surface ug/ft^2
1	Drill Hall	<5.6	*
2	Mess Hall	<5.6	*
3	Blank	<3 (ug)	*
4	Drill Hall – Floor by Exit Door	*	<110
5	Drill Hall – Window Sill	*	<110
6	Drill Hall – Kitchen – Top of Refrigerator	*	<110
7	Drill Hall – Room 214 – Supply Grill	*	<110
8	Drill Hall – Floor by Interior Exit	*	<110
9	**Converted Indoor Firing Range – Floor**	*	**500**
10	Converted Indoor Firing Range – Stored Item – Shipping Case	*	<110
11	**Converted Indoor Firing Range – Overhead Heater**	*	**680**
12	**Converted Indoor Firing Range – Light Fixture**	*	**980**
13	**Converted Indoor Firing Range – Exhaust Ventilation System**	*	**910,000**
14	**Outside Converted Indoor Firing Range – Hallway Floor**	*	**320**
15	Room 124 – File Cabinet	*	<110
16	Room 117 – Table	*	<110
17	Hallway – Floor by Room 120	*	<110
18	Blank	*	<12 (ug)

Key: **Bolded** results exceed listed criteria

Source: NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges

The National Guard Bureau currently utilizes 200 ug/ft^2 as a benchmark for identifying lead-contaminated surfaces. This guideline is referenced in NG PAM 420-15 "Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges"

as a satisfactory surface contamination level unless the facility is utilized as a childcare facility. In such cases, U.S. Department of Housing and Urban Development (HUD) limit of 40 ug/ft^2 on floors and 250 ug/ft^2 on windowsills should be observed. There is no child care provided at this facility.

Lead surface and air samples were collected.

- Surface levels of lead were at or above the recommended guideline of 200 ug/ft^2 in the following locations:

    - Converted Indoor Firing Range- Floor
    - Converted Indoor Firing Range – Overhead Heater
    - Converted Indoor Firing Range – Light Fixture
    - Converted Indoor Firing Range – Exhaust Ventilation System
    - Outside Converted Indoor Firing Range – Hallway Floor

    Cleaning procedures should be improved to maintain lead levels on surfaces below the recommended guideline of 200 ug/ft^2.

- Air samples for lead were below the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit of 50 micrograms per cubic meter (ug/m^3).

- Paint was observed to be in good condition throughout the facility.

Section 4.0
Lighting

Section 4.0 Lighting

A lighting assessment was conducted throughout the facility. Measurements were collected using a Cooke Cal-Light 400L Precision Light Meter (Serial No. K070155). The light meter was last calibrated on September 10, 2011. Measurements collected were compared to ANSI/IESNA RP-7-01 Lighting Industrial Facilities and RP-1-04 Office Lighting.

Light Survey Assessment Summary

Location	Foot Candles (FC)	Recommended Lighting (FC)	Sufficient Lighting
Drill Hall	53.3	10	Yes
Room 206 (Office)	53.6	30-50	Yes
Rom 207 (Office)	**15.4**	**30-50**	**No**
Room 209 (Office)	48.9	30-50	Yes
Room 211 (Office)	39.8	30-50	No
Room 212 (Office)	**26.8**	**30-50**	**No**
Room 213 (Office)	68.1	30-50	Yes
Room 214 (Office)	68.5	30-50	Yes
Conference Room	79.8	30-50	Yes
Exercise Room	50.5	30	Yes
Room 216 (Office)	30.9	30-50	Yes
Room 124 (Office)	**23.5**	**30-50**	**No**
Mess Hall	22.1	10	Yes
Locker Room	33.2	7	Yes
Kitchen	60.1	50	Yes
Room 112 (Office)	**18.3**	**30-50**	**No**
Ladies Latrine	22.3	5	Yes
Room 113 (Office)	35.8	30-50	Yes
Room 119 (Office)	33.8	30-50	Yes
Room 117 (Office)	53.0	30-50	Yes
Garage	**25.7**	**75**	**No**

Bolded results did not meet listed criteria

Source: ANSI/IESNA RP-7-01 Lighting Industrial Facilities and RP-1-04 Office Lighting.

The lighting level did not meet the minimum recommended guideline in the following areas:

- Room 207
- Room 212
- Room 124
- Room 112
- Garage

Lighting should be improved in these areas.

Section 5.0
Indoor Air Quality

Section 5.0 Indoor Air Quality

Survey measurements were made for ventilation and comfort parameters (carbon dioxide, temperature, carbon monoxide and relative humidity). The air quality measurements were collected using direct reading instrumentation for comfort parameters using a QTRAK IAQ Meter, Model 7565 (Serial #7565X0839017). The IAQ Meter was last calibrated in February 11, 2011.

The American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) have developed indoor air quality guidelines for mechanically ventilated office buildings and commercial settings (ASHRAE standard 62.1-2010). ASHRAE specifies temperature and relative humidity ranges for human comfort (ASHRAE 55-2010). The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation and Recommends maintaining a relative humidity range between 30 to 60%.

The following table summarizes the measurements collected.

IAQ Assessment Summary

Location	Temperature (◦F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)
Drill Hall	72.0	**72.3**	470	0.5
Room 206 (Office)	71.5	**72.6**	406	0.5
Rom 207 (Office)	71.5	**73.2**	430	0.7
Room 209 (Office)	71.7	**75.7**	434	0.9
Room 211 (Office)	71.9	**74.1**	411	0.5
Room 212 (Office)	72.0	**75.3**	437	1.0
Room 213 (Office)	72.3	**74.3**	462	0.6
Room 214 (Office)	72.5	**74.4**	434	0.3
Conference Room	72.6	**75.3**	433	0.5
Exercise Room	72.4	**70.8**	402	0.6
Room 216 (Office)	72.2	**72.6**	422	0.6
Room 124 (Office)	73.1	**66.2**	570	1.0
Mess Hall	70.6	52.6	452	0.9
Locker Room	71.6	**78.1**	453	0.2
Kitchen	71.4	53.7	501	0.6
Room 112 (Office)	71.9	**62.7**	440	0.8
Room 113 (Office)	72.5	**68.9**	475	0.8
Room 119 (Office)	72.3	**68.0**	399	0.8
Room 117 (Office)	72.5	**65.8**	403	1.0
Garage	74.4	**66.3**	338	0.7
Outdoors	72.4	79.9	344	0.5
Criteria	**68.0-79.0**	**30-60**	**<1,044**	**<9.0**

Key: **Bolded** results exceed listed criteria

Source: The American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) 55-2010 & The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation.

Summary of findings and recommendations:

- Relative humidity was above the recommended criteria of 30-60% in most areas. High relative humidity can provide and environment suitable for microbial growth and proliferation. Maintain relative humidity levels between 30-60%.

- Carbon dioxide levels did not exceed the recommended ceiling of 1,044 parts per million (ppm). This indicates that outdoor air ventilation is adequate in all areas.

- Carbon monoxide levels were less than the recommended ceiling of 9 ppm.

- A visual inspection was conducted throughout visually accessible portions of the facility. The visual inspection was conducted to assess sources or pathways of factors potentially deleterious to IAQ. It was reported that the HVAC system condensates. Some water damaged ceiling tiles were observed throughout the facility. Efflorescence was noted on the exterior wall in the dining room. Identify and repair the source of the water infiltration. Replace any water stained ceiling tiles.

- The HVAC supply grills located in some of the offices/classrooms were observed to be dirty. These should be cleaned. Do not permit dirt, debris, microbial growth, etc. to accumulate in any portion of the HVAC system.

Section 6.0
Ventilation

Section 6.0 Ventilation

There are a total of 4 above floor exhausts located in the garage of the John H. Pigman Readiness Center. Only three were accessible for evaluation. All measurements were conducted at the face of each exhaust using a Velocicalc Plus Model 9555-P. Measurements were compared to the ACGIH Industrial Ventilation Manual requirements for above floor exhaust systems. The table below details measurement findings.

ABOVE FLOOR EXHAUST VENTILATION RATE SUMMARY

Location	Type of Hood	Exhaust Diameter	Measured Flow Rate (CFM)
Garage Area Exhaust B	Above Floor LEV	3.5"	72
Garage Area Exhaust C	Above Floor LEV	3.5"	30
Garage Area Exhaust D	Above Floor LEV	4"	106

Reference: Industrial Ventilation, A Manual of Recommended Practice for Design, 27th Edition, ACGIH.

EXAMPLES OF VEHICLE LEV SYSTEM REQUIREMENTS

Vehicle Nomenclature	Tailpipe Temp. (°F)	Engine Displacement (ft3)	Engine RPMs*	Exhaust Flow † (CFM)
M35A2, 2.5 Ton Cargo Truck	300	0.277	2,500	1,192
M1008 CUCV, SUV	267	0.219	3,800	1,370
M923A2, 5 Ton Cargo Truck	300	0.293	1,700	857
M996 HMMWV, All Terrain Vehicle	297	0.219	3,300	1,294

* Revolutions per Minute † Includes 20% Safety Factor

The actual flow rate that is required in an overhead vehicle exhaust system varies depending on the engine tail pipe temperature, whether or not the vehicle is "under load" or idling, engine displacement, engine size, etc. As an example, a 15 Liter Engine running at 1,000 rpm with an exhaust gas temperature of 1,300 F (heavy load) would require an exhaust flow of 2,110 CFM. If vehicle maintenance is performed at this facility we recommend the vehicle exhaust system be utilized. It should be regularly inspected to determine if it is operating as designed and meets the minimum requirements as recommended by the American Conference of Governmental Industrial Hygienists (ACGIH) Industrial Ventilation: A Manual of Recommended Practice for Design (27th Edition).

Section 7.0

Suspect Asbestos Containing Building materials

Section 7.0 Suspect Asbestos Containing Building Materials

Based on the age of the building (e.g., constructed in 1950) asbestos-containing materials (ACM) could be present in the facility. The following suspect asbestos-containing materials were noted:

1. 12" x 12" vinyl floor tile located throughout the facility.
2. Transite roof decking (Approximately 5,000SF), located from the dining room to room 117.
3. Transite roof decking (Approximately 875 SF), located in the garage.
4. Sprayed on Insulation (Approximately 875 SF), located in the garage.

All suspect asbestos-containing materials were observed to be intact and in good condition. Inaccessible areas such as behind walls or crawlspaces were not inspected. No bulk samples were collected.

Section 8.0
Limitations

Section 8.0 Limitations

This report summarizes our evaluation of the conditions observed at the above referenced location. Our findings are based upon our observations and sampling results obtained at the facility at the time of our visit. The report, results, and subsequent recommendations reported herein are also limited to the information available at the time it was prepared and investigated. Conditions may have been in effect prior to the sampling events that have changed over time and which cannot be predicted within the scope of this limited investigation. Any conditions discovered which deviate from the data contained in this report should be presented to us for our evaluation.

This report is intended for the exclusive use of the client. This report and the findings herein shall not, in whole or in part, be relied upon by any other parties, disseminated or conveyed to any other party without prior written consent of the National Guard Bureau, and ALS Environmental. The findings are relative to the dates of our site visits and should not be relied upon for substantially later dates.

Appendix A
Laboratory Analysis Report

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY

LAP # 100478

Client:	National Guard Bureau	**Job Name:**	RC-Pigman	**Chain Of Custody:**	511596
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Seaford, DE	**Date Submitted:**	10/19/2011
	Havre de Grace, Maryland 21078	**Job Number:**	RC-Pigman	**Person Submitting:**	[redacted]
		P.O. Number:	NGB-IHNE	**Date Analyzed:**	10/24/2011 **Report Date:** 10/26/2011

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Total ug	Final Result		Comments
12006869	1110757-1	Flame	Air	535	N/A	5.6	ug/m^3	<3	<5.6	ug/m^3	
12006870	1110757-2	Flame	Air	535	N/A	5.6	ug/m^3	<3	<5.6	ug/m^3	
12006871	1110757-3	Flame	Air Blank	0	N/A	3	ug/m^3		<3	ug	
12006872	1110757-4	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12006873	1110757-5	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12006874	1110757-6	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12006875	1110757-7	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12006876	1110757-8	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12006877	1110757-9	Flame	Wipe	****	0.108	110	ug/ft^2	53	500	ug/ft^2	
12006878	1110757-10	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12006879	1110757-11	Flame	Wipe	****	0.108	110	ug/ft^2	73	680	ug/ft^2	
12006880	1110757-12	Flame	Wipe	****	0.108	110	ug/ft^2	110	980	ug/ft^2	
12006881	1110757-13	Flame	Wipe	****	0.108	110	ug/ft^2	97000	910000	ug/ft^2	
12006882	1110757-14	Flame	Wipe	****	0.108	110	ug/ft^2	34	320	ug/ft^2	
12006883	1110757-15	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12006884	1110757-16	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12006885	1110757-17	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12006886	1110757-18	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY

Lab id 100470

Client:	National Guard Bureau	Job Name:	RC-Pigman	Chain Of Custody:	511596
Address:	301-IH Old Bay Esne, Attn: ARNG-CIG-P, State Military Reservation	Job Location:	Seaford, DE	Date Submitted:	10/19/2011
	Havre de Grace, Maryland 21078	Job Number:	RC-Pigman	Person Submitting:	[redacted]
		P.O. Number:	NGB-IHNE	Date Analyzed:	10/24/2011 Report Date: 10/26/2011

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)

%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.

Analyst: [redacted] Non-Responsive

Technical Manager: [redacted] Non-Responsive

Page 1 of 2

OW (410) 217-2027 — 199802 — 210 REV. 6.08

AMA Analytical Services, Inc.

Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires)

511596

pom 1/2

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SL State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: RC-Pigman
2. Job Location: Seaford, DE
3. Job #: RC-Pigman P.O. #: ~~W912K6-09-A-0005~~ NGB-JHNE
4. Contact Perso[redacted]
5. Submitted by[redacted]

Reporting Information (Results will be provided [redacted]

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS			REPORT TO:
☐ Immediate Date Due:	☐ Immediate	☐ 3 Day	☐ Results Required By Noon (Every Attempt Will Be Made to Accommodate)	☒ Include [redacted] with Report
☐ 24 Hours Time Due:	☐ Next Day	☒ 5 Day + 10/26/11		☒ [redacted] @sglobal.com
Comments:	☐ 2 Day	Date Due:		☐ Fax [redacted] @us.army.mil
				☐ Verba[redacted] @us.army.mil

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
- ☐ NIOSH 7400 ____ (QTY)
- ☐ Fiberglass ____ (QTY)

TEM Air – Please Indicate Filter Type:
- ☐ AHERA ____ (QTY)
- ☐ NIOSH 7402 ____ (QTY)
- ☐ Other (specify ____) ____ (QTY)

PLM Bulk
- ☐ EPA 600 – Visual Estimate ____ (QTY)
- ☐ EPA Point Count ____ (QTY)
- ☐ NY State Friable 198.1 ____ (QTY)
- ☐ Grav. Reduction ELAP 198.6 ____ (QTY)
- ☐ Other (specify ____) ____ (QTY)

MISC
- ☐ Vermiculite
- ☐ Asbestos Soil PLM ___ (Qual PLM) ___ (Quant PLM/TEM) ___ (Qual PLM/TEM ___) (Quant)

TEM Bulk
- ☐ ELAP 198.4 (Chatfield) ____ (QTY)
- ☐ NY State PLM/TEM ____ (QTY)
- ☐ Residual Ash ____ (QTY)

TEM Dust
- ☐ Qual. (pres/abs) Vacuum/Dust ____ (QTY)
- ☐ Quan. (s/area) Vacuum D5755-05 ____ (QTY)
- ☐ Quan. (s/area) Dust D6480-99 ____ (QTY)

TEM Water
- ☐ Qual. (pres/abs) ____ (QTY)
- ☐ ELAP 198.2/EPA 100.2 ____ (QTY)
- ☐ EPA 100.1 ____ (QTY)

☒ All samples received in good condition unless otherwise noted.
(TEM) Water samples ____ °C

Metals Analysis
- ☐ Pb Paint Chip ____ (QTY)
- ☒ Pb Dust Wipe (wipe type Ghost) 15 (QTY)
- ☒ Pb Air 3 (QTY)
- ☐ Pb Soil/Solid ____ (QTY)
- ☐ Pb TCLP ____ (QTY)
- ☐ Drinking Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
- ☐ Waste Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
- ☐ Pb Furnace (Media ____) ____ (QTY)

Fungal Analysis

Collection Apparatus for Spore Traps/Air Samples: ____
Collection Media ____
- ☐ Spore-Trap ____ (QTY)
- ☐ Surface Swab ____ (QTY)
- ☐ Surface Tape ____ (QTY)
- ☐ Other (Specify ____) (QTY)
- ☐ Surface Vacuum Dust ____ (QTY)
- ☐ Culturable ID Genus (Media ____) ____ (QTY)
- ☐ Culturable ID Species (Media ____) ____ (QTY)

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	[illegible]	[illegible]	TAPE	SWAB
1110757-1		10/14	535					X		X						
1110757-2		↓	535					X		X						
1110757-3		↓	0					X		X						
1110757-4		↓		100cm²				X			~~X~~	X				
1110757-5		↓		↓				X			~~X~~	X				
1110757-6		↓		↓				X			~~X~~	X				
1110757-7		↓		↓				X			~~X~~	X				
1110757-8		↓		↓				X			~~X~~	X				
1110757-9		↓		↓				X			~~X~~	X				
1110757-10		↓		↓				X			~~X~~	X				
1110757-11		↓		↓				X			~~X~~	X				
1110757-12		↓		↓				X			~~X~~	X				

CLIENT CONTACT

(LABORATORY STAFF ONLY)

Date/Time:	Contact:	By:
Date/Time:	Contact:	By:
Date/Time:	Contact:	By:

[redacted]

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 10 / 19 / 11 @ 915 Via: UPS By (Print): [redacted]
2. Date/Time Analyzed: ____ / ____ / ____ @ ____ By (Print): ____
3. Results Reported To: ____ Via: ____ Date: ____ / ____ / ____ Time: ____ Initials: ____
4. Comments: 1Z X17 395 03 4087 7671

AC

Page 2 of 2

COC 04/01/2 17/2024 Page 2 210 REV. 6.08

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 511596 page 2/2

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SL State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: RC-Pigman
2. Job Location: Seaford, DE
3. Job #: RC-Pigman P.O. #: W912K6-09-A-0003
4. Contact Person: [redacted] @ phone # (410) 942-0273
5. Submitted by: Signature:

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled): ☐ Immediate Date Due: ☐ 24 Hours Time Due: Comments:

NORMAL BUSINESS HOURS: ☐ Immediate ☐ Next Day ☐ 2 Day ☐ 3 Day ☒ 5 Day + Date Due: ☐ Results Required By Noon (Every Attempt Will Be Made to Accommodate)

REPORT TO: ☒ Include COC/Field Data Sheets with Report ☒ [redacted]@us.army.mil ☐ Fax: [redacted]@us.army.mil ☐ Verbal

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 ____ (QTY)
☐ Fiberglass ____ (QTY)

TEM Air – Please Indicate Filter Type:
☐ AHERA ____ (QTY)
☐ NIOSH 7402 ____ (QTY)
☐ Other (specify ____) ____ (QTY)

PLM Bulk
☐ EPA 600 – Visual Estimate ____ (QTY)
☐ EPA Point Count ____ (QTY)
☐ NY State Friable 198.1 ____ (QTY)
☐ Grav. Reduction ELAP 198.6 ____ (QTY)
☐ Other (specify ____) ____ (QTY)

MISC
☐ Vermiculite
☐ Asbestos Soil PLM ___(Qual) PLM ___(Qual) PLM/TEM ___(Qnt) PLM/TEM ___(Qnt)

TEM Bulk
☐ ELAP 198.4/Chatfield ____ (QTY)
☐ NY State PLM/TEM ____ (QTY)
☐ Residual Ash ____ (QTY)

TEM Dust
☐ Qual. (pres/abs) Vacuum/Dust ____ (QTY)
☐ Quan. (s/area) Vacuum D5755-95 ____ (QTY)
☐ Quan. (s/area) Dust D6480-99 ____ (QTY)

TEM Water
☐ Qual. (pres/abs) ____ (QTY)
☐ ELAP 198.2/EPA 100.2 ____ (QTY)
☐ EPA 100.1 ____ (QTY)

☐ All samples received in good condition unless otherwise noted. (TEM Water samples ____ °C)

Metals Analysis
☐ Pb Paint Chip ____ (QTY)
☐ Pb Dust Wipe (wipe type ____) ____ (QTY)
☐ Pb Air ____ (QTY)
☐ Pb Soil/Solid ____ (QTY)
☐ Pb TCLP ____ (QTY)
☐ Drinking Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
☐ Waste Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
☐ Pb Furnace (Media ____) ____ (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples: ____
Collection Media ____
☐ Spore-Trap ____ (QTY) ☐ Surface Vacuum Dust ____ (QTY)
☐ Surface Swab ____ (QTY) ☐ Culturable ID Genus (Media ____) ____ (QTY)
☐ Surface Tape ____ (QTY) ☐ Culturable ID Species (Media ____) ____ (QTY)
☐ Other (Specify ____) ____ (QTY)

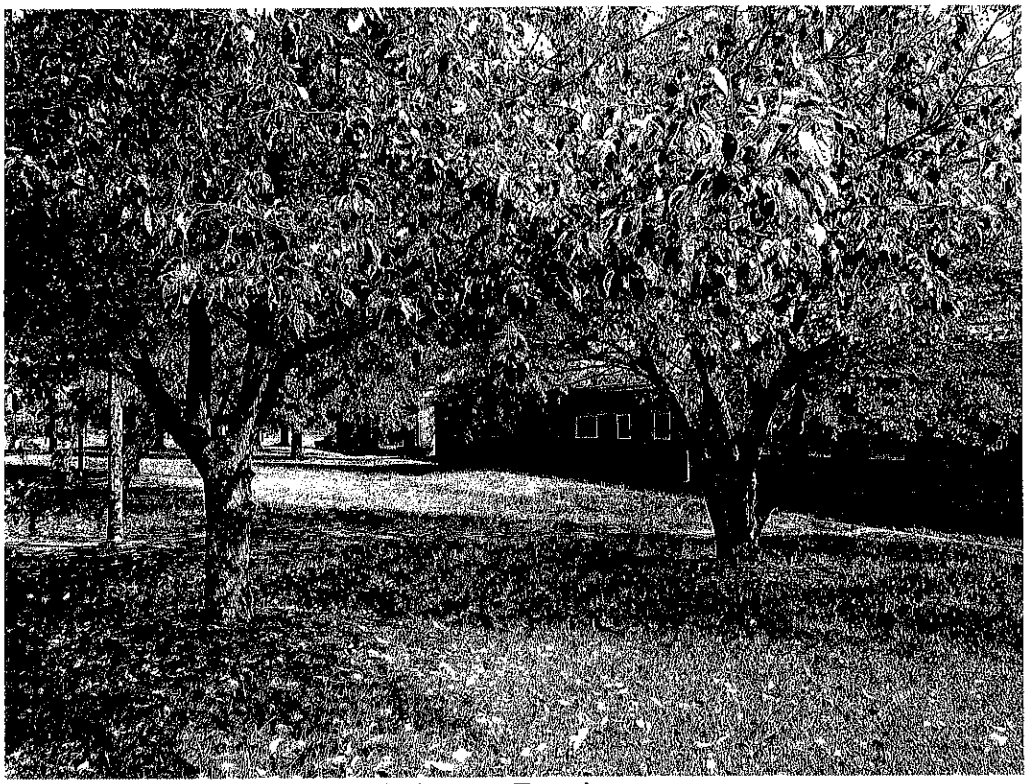
CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	DRINKING WATER	WASTE WATER	SOIL	TAPE	SWAB
1110757-13		10/14	[illegible]	100cm²				X				X					
1110757-14		↓		↓				X				X					
1110757-15		↓		↓				X				X					
1110757-16		↓		↓				X				X					
1110757-17		↓		↓				X				X					
1110757-18		↓	[illegible]	100cm²				X				X					

CLIENT CONTACT (LABORATORY STAFF ONLY)
Date/Time: Contact: By:
Date/Time: Contact: By:
Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: / / @ Via: By (Print): Sign: [redacted]
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments:

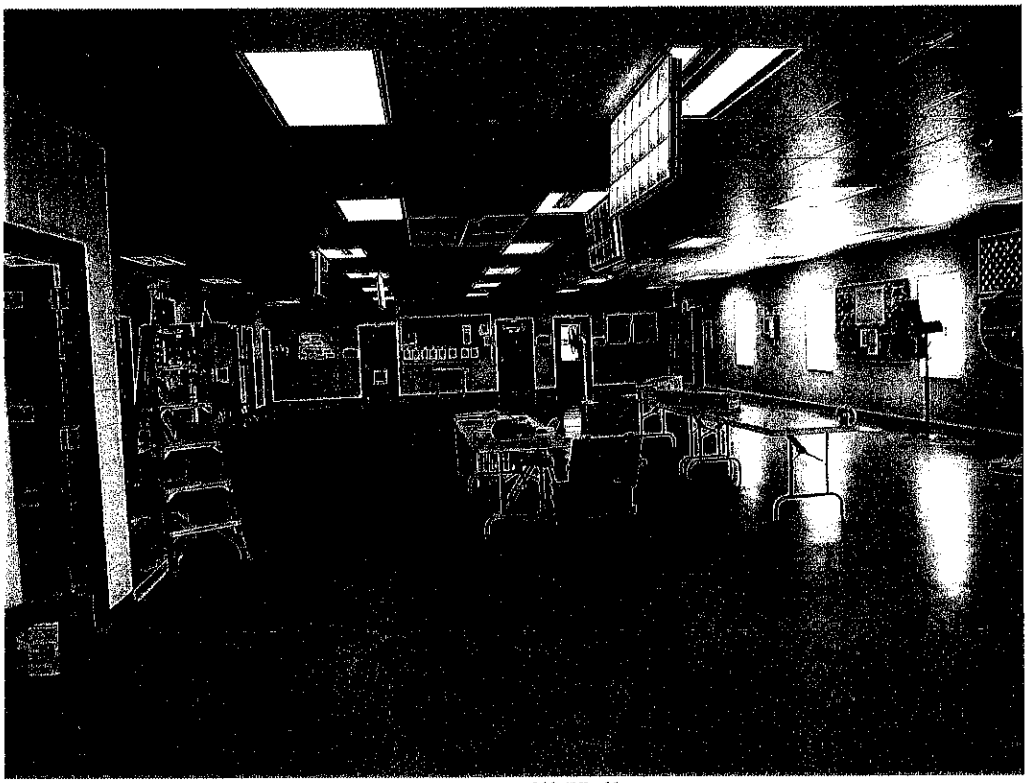
BEST AVAILABLE COPY

Appendix B
Photographs

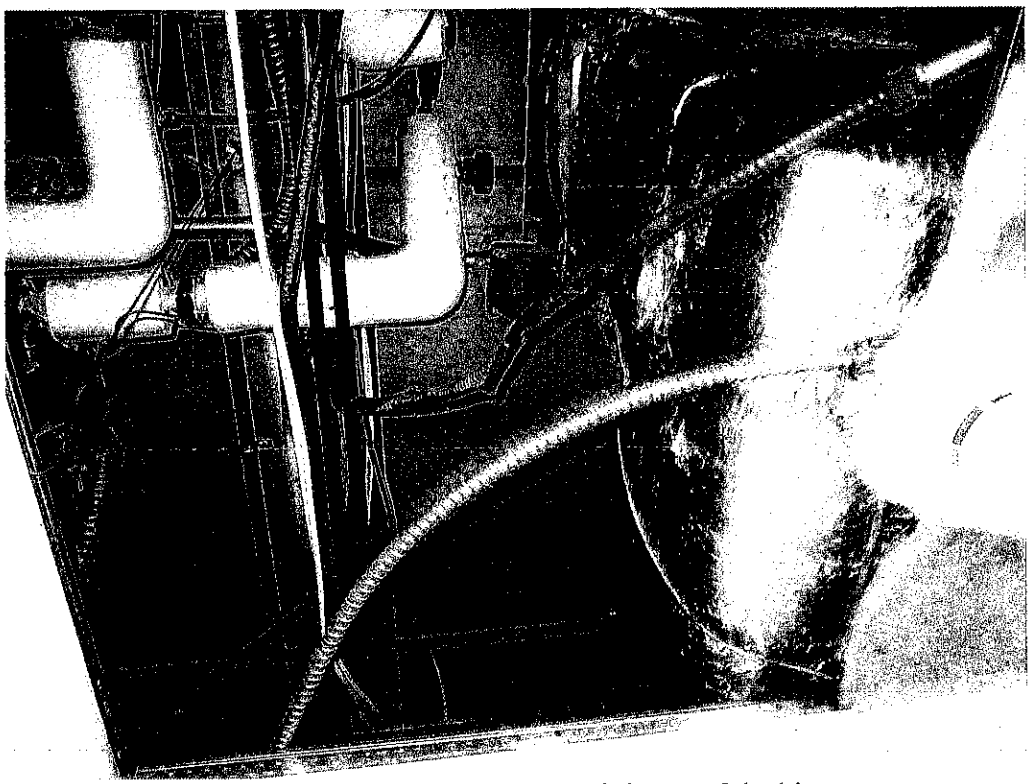


RC Pigman- Exterior

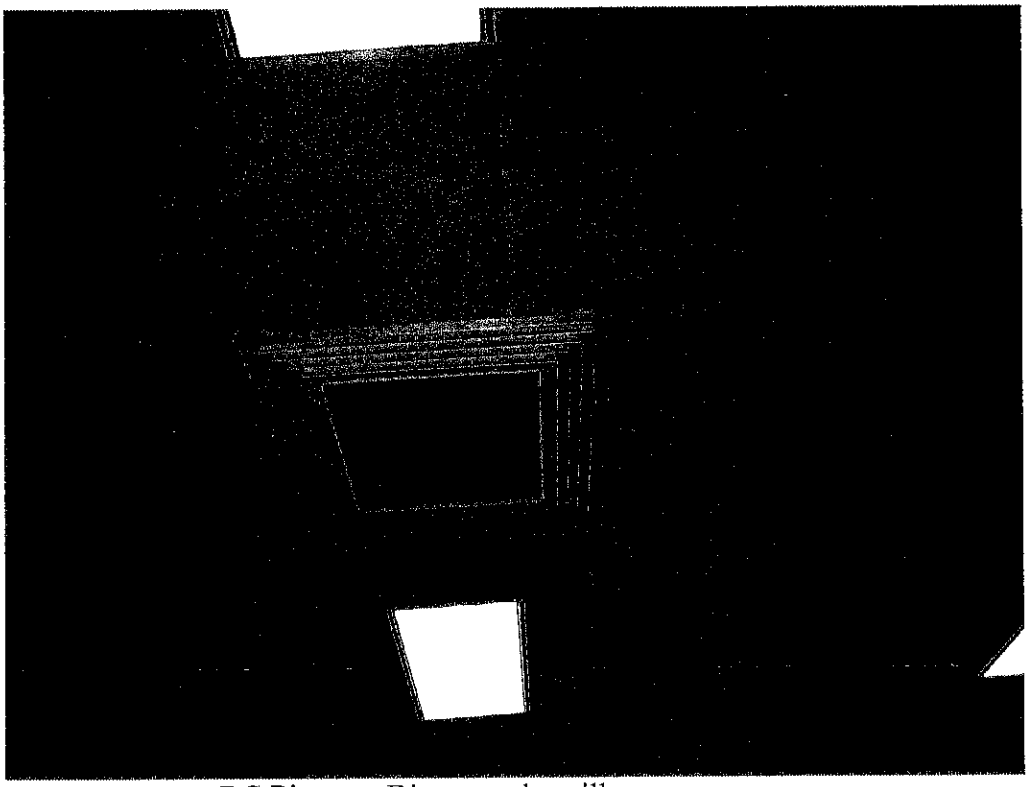
RC Pigman- Exterior



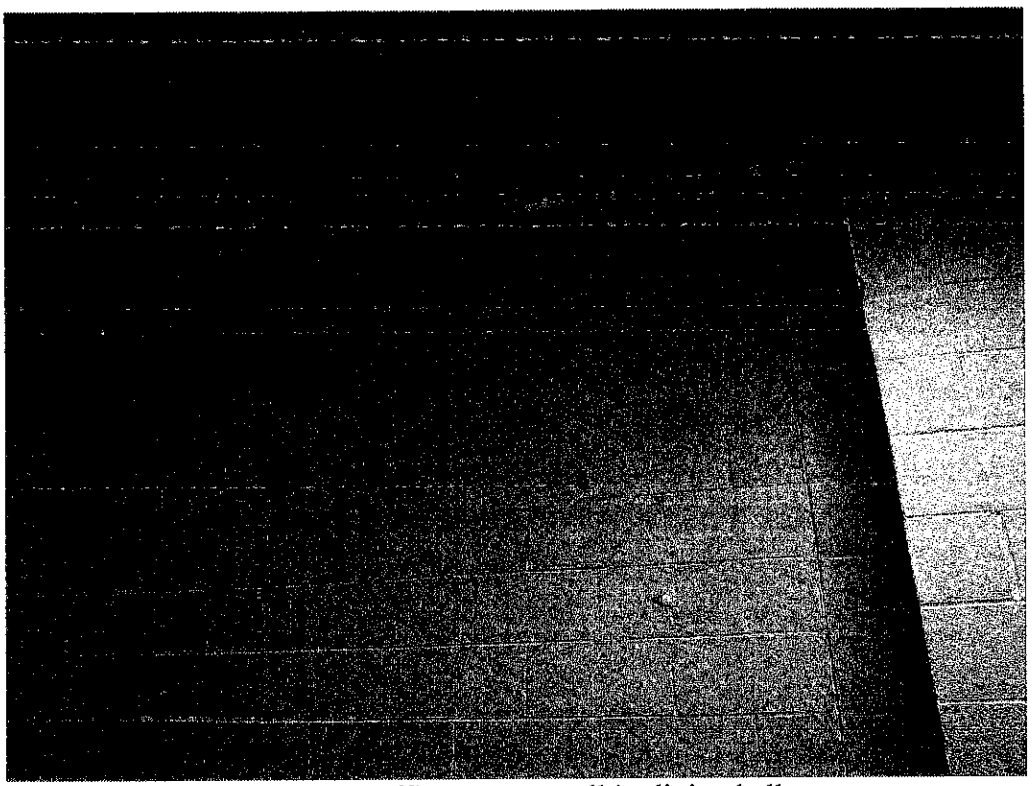
RC Pigman- Drill Hall



RC Pigman- Suspect asbestos containing roof decking

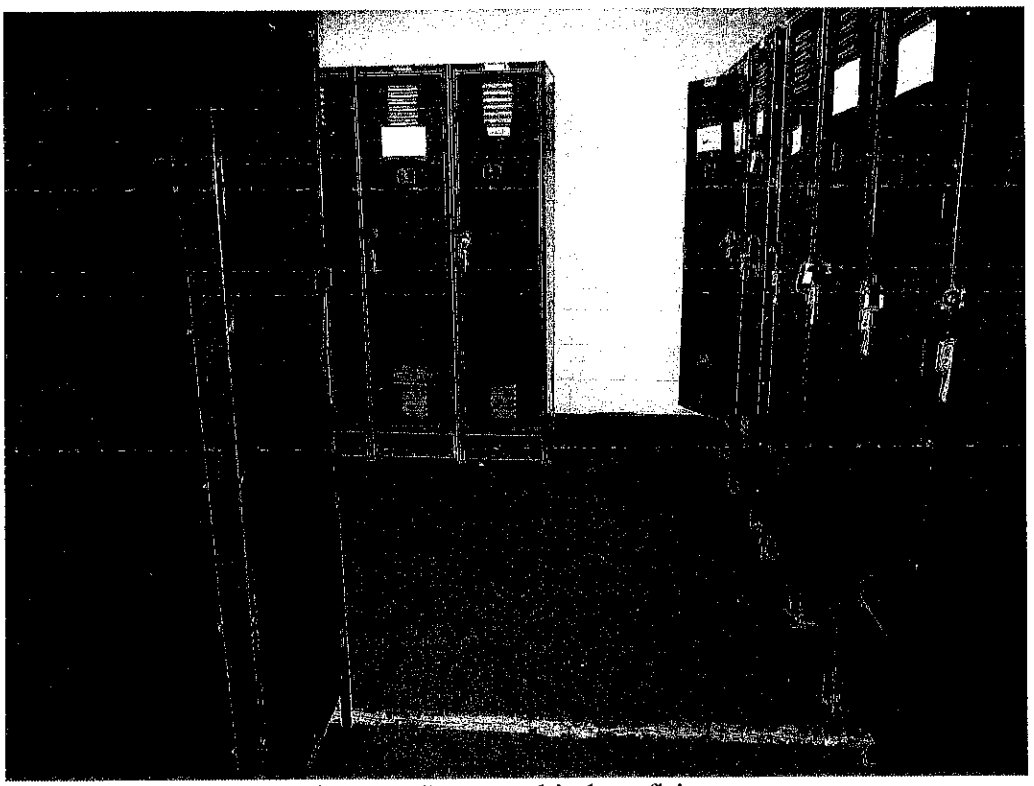


RC Pigman- Dirty supply grill

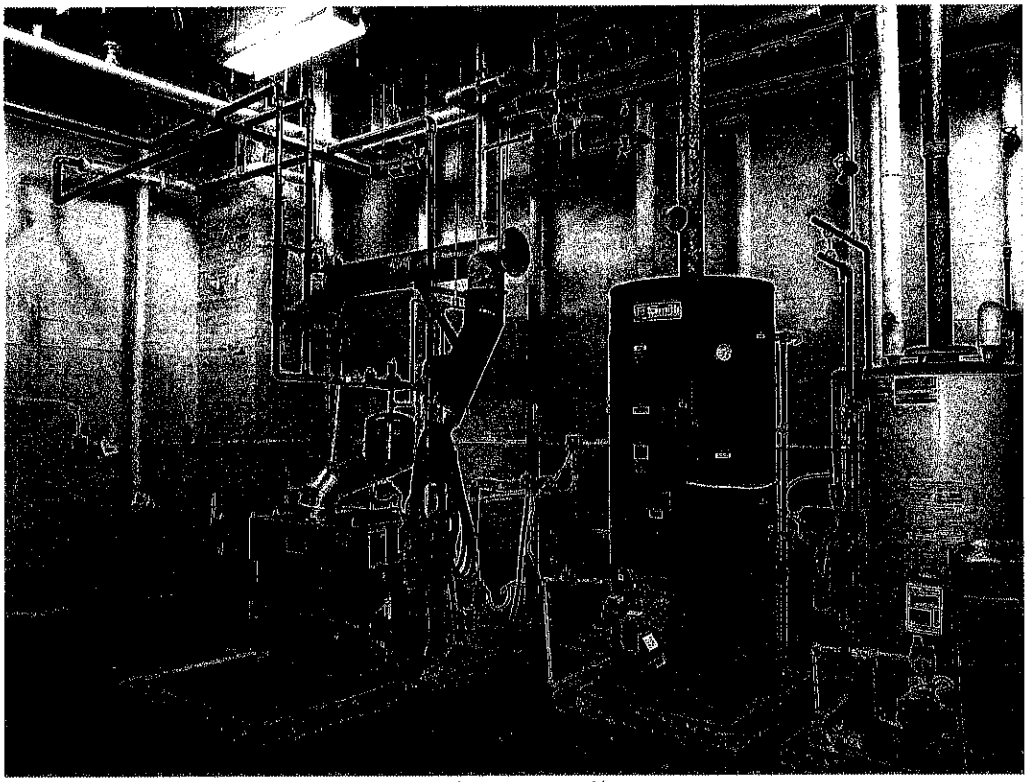


RC Pigman- Effloresce on wall in dining hall

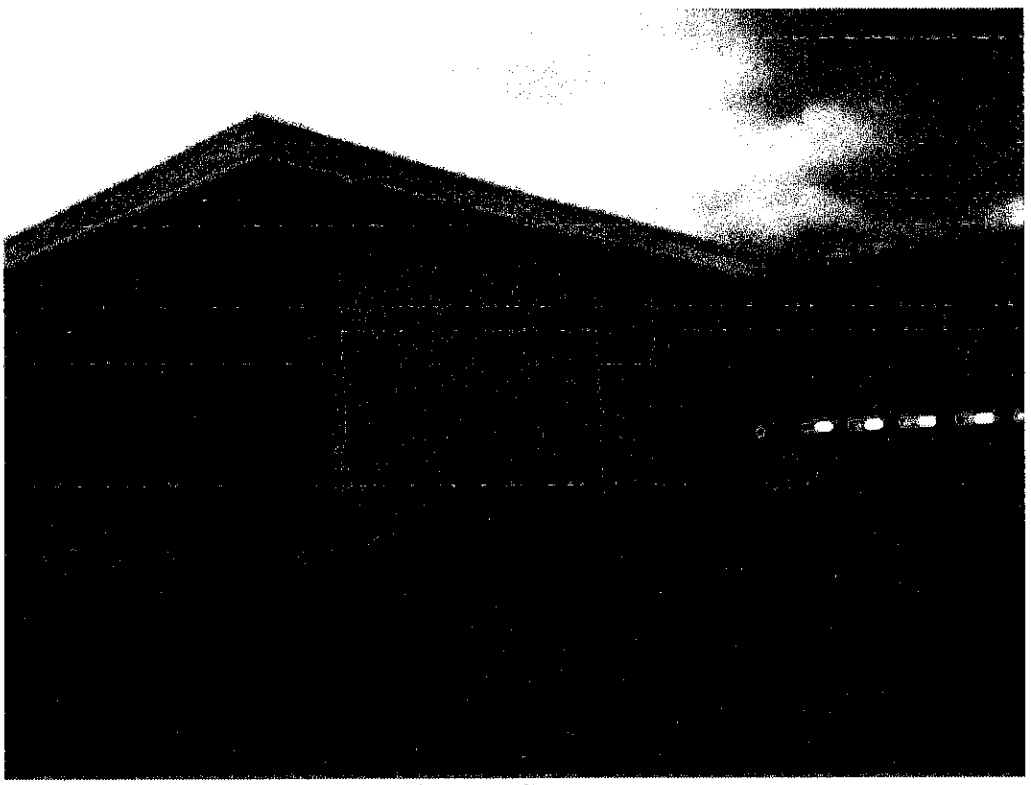
RC Pigman- Converted indoor firing range



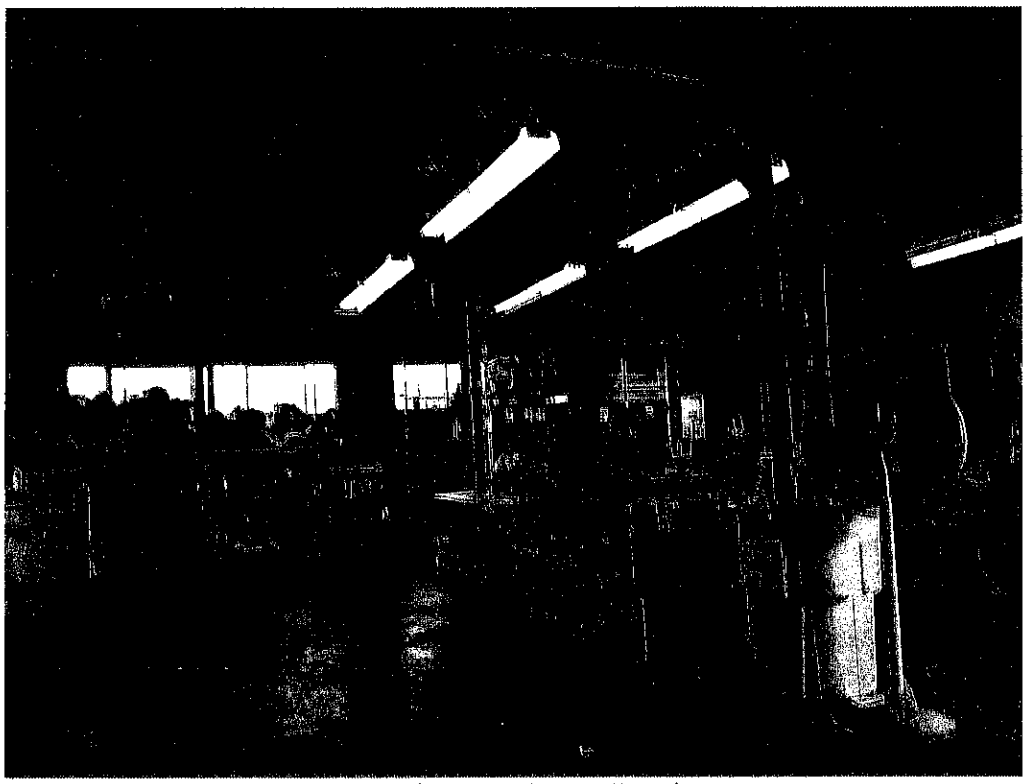
RC Pigman- Converted indoor firing range



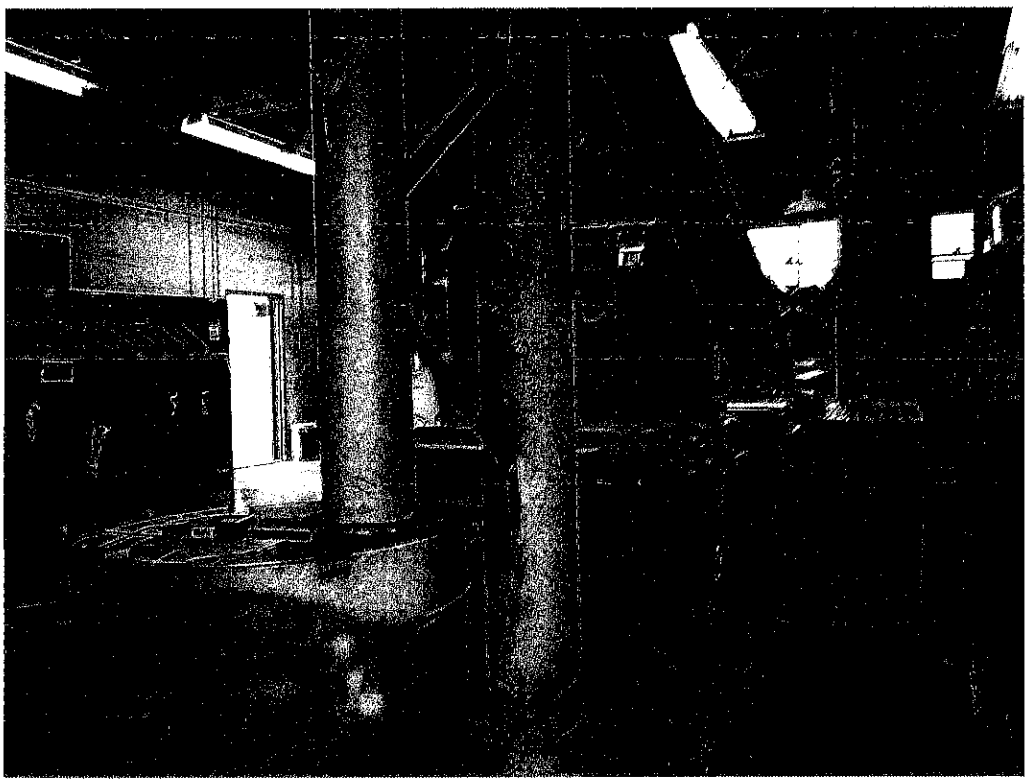
RC Pigman- Boiler



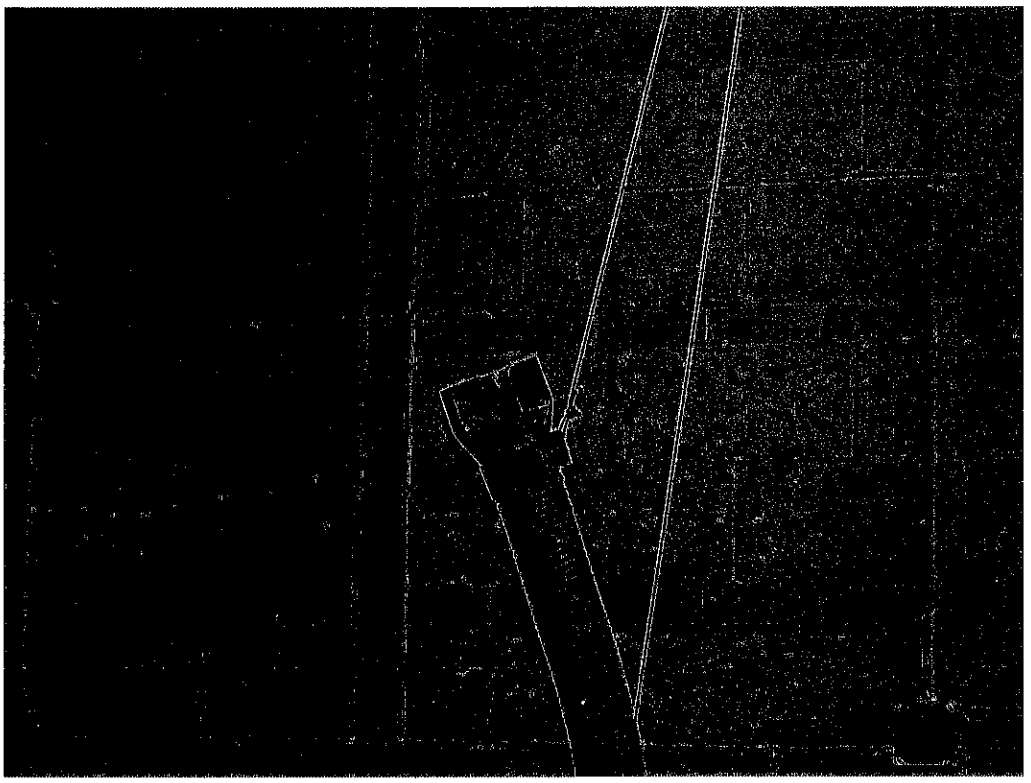
RC Pigman- Garage



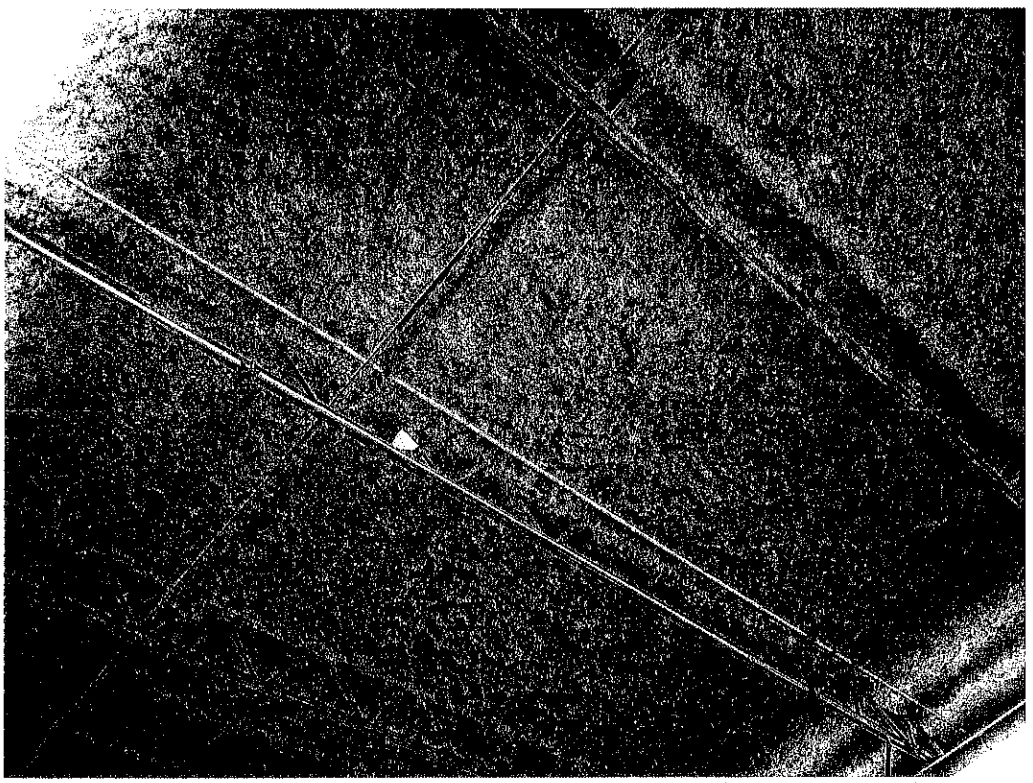
RC Pigman- Garage Interior



RC Pigman- Garage LEV system

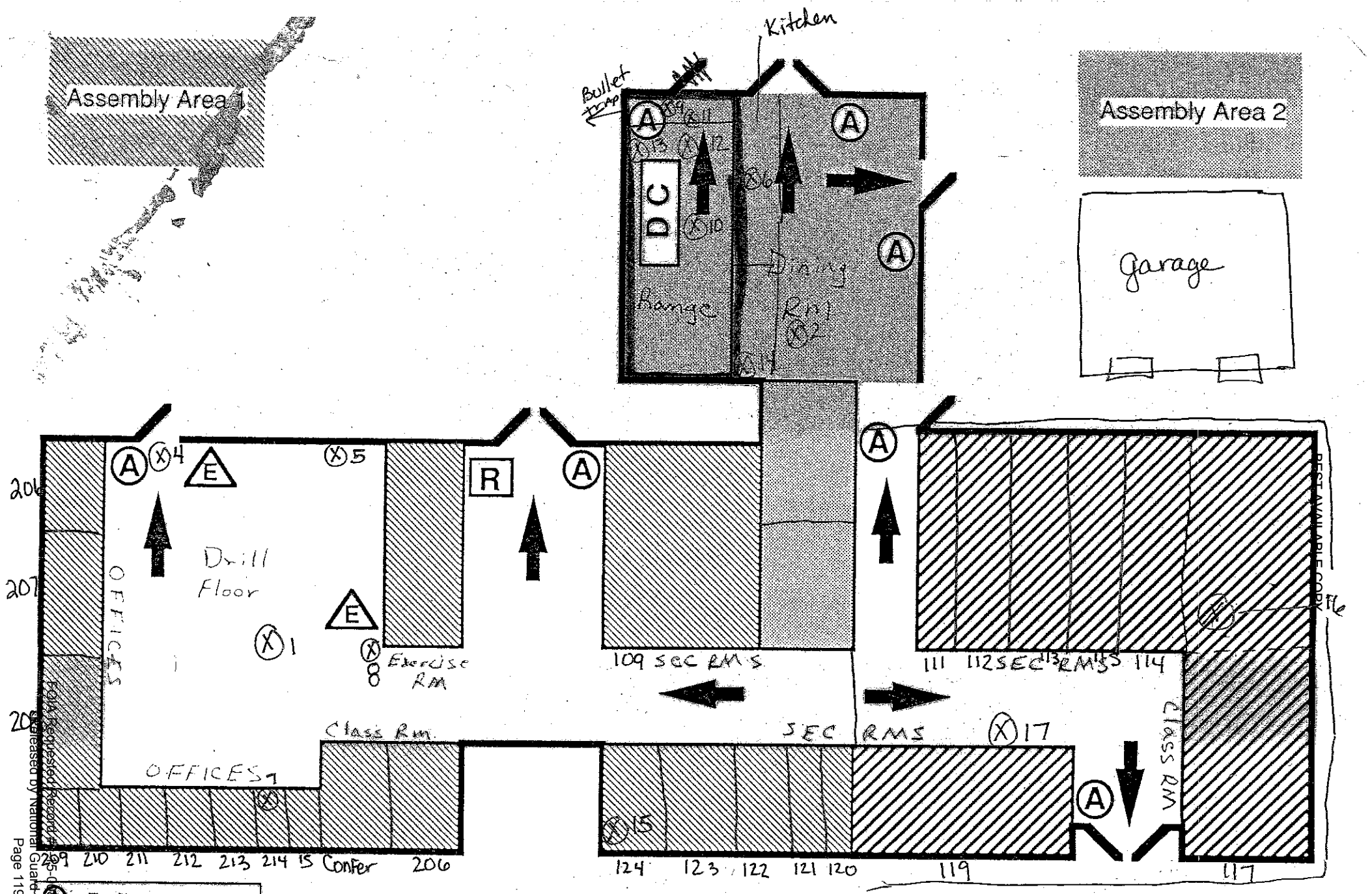


RC Pigman- Garage LEV system



RC Pigman- Suspect asbestos containing sprayed on ceiling insulation in garage

Appendix C
Floor Plan



John H. Pigman Armory
Evacuation/Fire Plan

Assembly Area 3

Appendix D
References

Appendix D. References

1. Title 29 Code of Federal Regulations (CFR), Part 1910.1025, Occupational Safety and Health Administration, Occupational Exposure to Lead

2. American Conference of Governmental Industrial Hygienists (ACGIH) – Threshold Limit Values and Biological Exposure Indices, 2011 Edition

3. Industrial Ventilation: A Manual of Recommended Practice for Design, 27th Edition

4. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Ventilation for Acceptable Indoor Air Quality, 62.1-2010

5. RP-1-2004, Industrial Lighting, Illuminating Engineering Society of North America/ANSI

6. RP-7-2001, Industrial Lighting, Illuminating Engineering Society of North America/ANSI

7. National Emission Standard Hazardous Air Pollutants (NESHAP) – The standards for asbestos are contained in 40 CFR 61.140 through 61.157.

8. Environmental Protection Agency (EPA) standards [40 Code of Federal Regulations (CFR) 745.227(h)(3)]

9. Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM)

10. The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation, Feb 2002.

11. NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 NOV 06.

12. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Thermal Environmental Conditions for Human Occupancy, 55-2010.

Shaw Environmental, Inc.

312 Directors Drive
Knoxville, TN 37923
865.690.3211
Fax 865.690.3626

Shaw® Shaw Environmental, Inc.

198th Regiment Readiness Center – Wilmington, Delaware

Industrial Hygiene Evaluation

Prepared for:

National Guard Region North Industrial Hygiene Office
Havre De Grace, Maryland 21078

Prepared by:

Shaw Environmental. Inc.
312 Directors Drive
Knoxville, Tennessee 37923

10 December 2003

National Guard Armory
198th Regiment Readiness Center – Wilmington, Delaware

Industrial Hygiene Evaluation

Prepared for:

National Guard Region North Industrial Hygiene Office
Havre De Grace, Maryland 21078

Prepared by:
Shaw Environmental, Inc.
312 Directors Drive
Knoxville, Tennessee 37923

10 December 2003

Prepared by: Non-Responsive
Industrial Hygienist

Reviewed by: Non-Responsive
Business Line Manager

Table of Contents

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List of Appendices

Executive Summary

Shaw Environmental, Inc. was contracted to perform an industrial hygiene evaluation for the 198th Regiment Readiness Center in Wilmington, Delaware. Non-Responsive performed the evaluation on 26 June 2003 and 3 October 2003. The point of contact at the readiness center was SFC Non-Responsive

The following industrial hygiene concerns were evaluated.

- Wipe Sampling for Lead
- Air Sampling for Lead
- Peeling Paint – Lead
- Suspected Asbestos Containing Material
- Water Damage
- Presence of Mold
- Housekeeping
- Ergonomic Concerns
- Indoor Air Quality
- Safety and Industrial Hygiene Programs
- Ventilation System Evaluation
- Contamination of Clean Air Sources
- Noise Exposure
- Lighting
- Converted Indoor Firing Ranges
- HVAC Systems

The following items were either not applicable to the armory or the evaluation resulted in a conclusion that there were no industrial hygiene concerns.

- Air Sampling for Lead
- Peeling Paint – Lead
- Presence of Mold
- Housekeeping
- Ergonomic Concerns
- Safety and Industrial Hygiene Programs

- Ventilation System Evaluation
- Contamination of Clean Air Sources
- Noise Exposure
- Converted Indoor Firing Ranges

Areas where there were industrial hygiene concerns are as follows:

- Wipe sampling for lead revealed concentration above the recommended level at two locations in the assembly room (top of a cabinet and top of a locker). It is recommended that the tops of all lockers and cabinets be thoroughly cleaned to reduce the lead level. In addition, any other dusty/dirty areas in the assembly area/ drill floor should be thoroughly cleaned.
- Materials (maintenance room pipes) suspected of containing asbestos were observed. An operations and maintenance plan should be followed when performing any activities that may disturb the suspected asbestos-containing materials.
- Water damage was observed in the boiler room (mechanical room), Room 202, Room 204, firing range ceiling, copier room, supply room, and hallway. The source of the water damage was likely from roof leak, however, the source should be identified and actions taken to eliminate the source in order to prevent the possibility of mold growth that may lead to indoor air quality problems.
- Although there were no employee indoor air quality complaints, the temperature and humidity in parts of the building were above the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) indoor air quality recommendations. It appeared that there is not an adequate HVAC system, with appropriate maintenance, that would keep the temperature and humidity within the comfort parameters. Consideration should be given to evaluating the HVAC system to ensure that it is working properly so that it will provide adequate cooling and humidity control for the armory. In addition, a fan could be used for cooling purposes to circulate the air.
- Lighting measurements were conducted at the armory. The lighting did not meet the minimum requirements in some areas evaluated; therefore, consideration should be given to providing more lighting to these areas.
- It was deemed that maintenance does occur on a regular basis for the HVAC system; however, maintenance is probably not effective because the air conditioning does not work properly in certain areas. A new motor for the HVAC system is currently on order, and should be installed as soon as possible. Proper maintenance should occur on a regular basis to ensure that the HVAC system is maintained in a good condition.

1.0 Introduction

Shaw Environmental, Inc. was contracted to perform an industrial hygiene evaluation for the 198th Regiment Readiness Center in Wilmington, Delaware. [redacted] performed the evaluation on 26 June 2003 and 3 October 2003. The point of contact at the readiness center was SFC [redacted]

The findings, discussion, and interpretation of results are provided in Section 2.0. The conclusions are provided in Section 3.0. The HHIM data form for the facility is provided in Appendix A. The building layout is provided in Appendix B. Sampling sheets and laboratory analyses are provided in Appendix C. References are provided in Appendix D. The *Recommendations for Surface Lead Dust in Armories* document is provided in Appendix E.

The statements, opinions, and conclusions contained in this report are based solely upon the services performed by Shaw as described in the report. In performing these services and preparing the report, Shaw relied upon the work and information provided by others, including public agencies, whose information is not guaranteed by Shaw Environmental, Inc.

2.0 Findings, Discussion, and Interpretation of Results

The results, discussion, and interpretation of results are provided in the following sections.

2.1. Sampling for Lead

2.1.1 Wipe Sampling

Wipe samples were collected for lead from the drill floor/assembly area. Also, wipe samples were collected for lead in rooms, hallways, foyers, etc. The sampling in rooms, hallways, foyers, etc represented approximately 25% of the building. Approximately half of the samples were collected from surfaces in common areas, such as surfaces of a desk. The remaining samples were collected from uncommon surface areas, such as a supply vent or the top of a file cabinet. The samples were collected and analyzed in accordance with the Instructions for *Completing the Sampling of ARMY National Guard Armories* procedure.

The only samples initially submitted for analysis were those from the drill floor/ assembly area. If there were positive results from the drill floor/assembly area, the other samples would be submitted for analysis.

Results of the wipe sampling are provided in Table 1. The results revealed lead at all locations sampled at concentrations below the recommended level of 200 micrograms lead per square foot ($\mu g/ft^2$) (see Appendix E) except in two locations. The lead concentrations on top of a locker and on top of a cabinet in the assembly hall were 210 $\mu g/ft^2$ and 660 $\mu g/ft^2$, respectively. It is recommended that this microwave, and the immediate area around the microwave, be thoroughly cleaned to reduce the lead level. In addition, any other dusty/dirty areas in the assembly area/ drill floor should be thoroughly cleaned.

2.1.2 Air Sampling

Breathing zone air samples were conducted on two (2) full-time building occupants. (Please note that no State employees were monitored.) The samples were collected and analyzed in accordance with Method 7082 of the National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods.

The results of the sampling are provided in Table 2. The results revealed non-detectable concentrations of lead in the breathing zone of the employees, therefore, no actions are necessary.

2.2 Physical Condition of Facility

2.2.1 Peeling Paint - Lead

Peeling paint was not observed at the armory, therefore, bulk samples for lead in paint were not taken.

2.2.2 Visual Inspection - Asbestos

A visual inspection was made to determine if there was any suspected asbestos-containing material at the armory. Materials suspected of containing asbestos were observed. The suspected asbestos-containing materials, with condition and estimated quantity, were at the following location:

- Boiler Room (Mechanical Room) – Good Condition, Approximately 4 Linear Feet

An operations and maintenance plan should be followed when performing any activities that may disturb the suspected asbestos-containing materials.

2.2.3 Visual Inspection – Water Damage and Mold

A visual inspection was made to determine if there was any water damage or visible mold at the armory. Visible mold was not observed, however, water damage was observed at the armory. The water damage was observed at the following locations:

- Boiler Room (Mechanical Room)
- Room 202 ceiling
- Room 204 ceiling
- Firing range ceiling
- Copier room ceiling
- Supply room ceiling
- Hallway ceiling

The source of the water damage was likely from roof leaks. The source of the water damage should be identified and actions taken to eliminate the source in order to

prevent the possibility of mold growth that may lead to indoor air quality problems.

2.2.4 Visual Inspection - Housekeeping

The housekeeping was determined to be good. No dirt or trash was visible on the floors.

2.3. Building Concerns

2.3.1 Ergonomic Concerns

Interviews with employees and observation of work activities revealed no ergonomic concerns at the armory.

2.3.2 Indoor Air Quality

Interviews with employees and measurements for humidity and temperature revealed that there are indoor air quality concerns at the armory. The humidity and temperature in parts of the building were above the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) indoor air quality recommendations. It appeared that there is not an adequate HVAC system, with appropriate maintenance, that would keep the temperature and humidity within the comfort parameters. Consideration should be given to evaluating the HVAC system to ensure that it is working properly so that it will provide adequate cooling and humidity control for the armory. In addition, a fan could be used for cooling purposes to circulate the air.

The results of the measurements for carbon dioxide, humidity, and temperature are provided in Table 3.

2.4. Safety and Industrial Hygiene Programs

An evaluation was performed to determine the applicability of the following programs.

- Confined Spaces
- Hearing Conservation
- Respiratory Protection
- Hazard Communication (HAZCOM)
- Personal Protective Equipment (PPE)

It was determined that none of the programs were applicable at the armory.

2.5. Ventilation

2.5.1 Ventilation System Evaluation

There were no local exhaust ventilation systems at this armory, therefore, no ventilation studies were performed.

2.5.2 Contamination of Clean Air Sources

Since there were no local exhaust ventilation systems at the armory, there was no possibility that clean air sources could be contaminated by exhaust air.

2.6. Noise Dosimetry

An evaluation was performed to determine if there were any hazardous noise areas at the armory. It was determined that there were no areas at the armory that would exceed the permissible exposure limit for noise.

2. 7 Lighting

Lighting measurements were conducted at the armory. The lighting did not meet the minimum requirements in the following areas:

- Drill Floor
- Women's Restroom
- Training Room
- Copier Room
- Stairwell
- Room 111
- Supply Room
- 2nd Floor Corridor
- Room 204
- 2nd Floor 198 Battalion Office
- Room 202

Results of the lighting evaluation are provided in Table 4. Consideration should be given to providing more lighting to the areas listed above. This may be accomplished by replacing burnt out luminaries, cleaning fixtures, cleaning windows, painting walls with a lighter color, repositioning detailed work to higher illuminated areas, and using supplemental lighting.

2. 8. Converted Indoor Firing Ranges

There was not a converted indoor firing range at the facility. Note that there was an active indoor firing range at the facility.

2.9. HVAC System

The maintenance schedule for the HVAC system was evaluated to verify that maintenance occurs on a regular basis. It was deemed that maintenance does occur on a regular basis, however, maintenance is probably not effective because the air conditioning does not work properly in certain areas. A new motor for the HVAC system is currently on order, and should be installed as soon as possible. Proper maintenance should occur on a regular basis to ensure that the HVAC system is maintained in a good condition.

2.10. HHIM

A Health Hazard Information Module (HHIM) form was completed for the armory. The completed form is provided in Appendix A.

3.0 Conclusions

It is concluded that there were no industrial hygiene concerns at the armory with regards to atmospheric exposure to lead, peeling lead-based paint, visible mold, housekeeping, ergonomic concerns, safety and industrial hygiene programs, ventilation systems or contamination of clean air sources, noise exposure, and surface lead contamination in a converted firing range.

There were industrial hygiene concerns at the armory with regards to lead surface contamination, suspected asbestos-containing material, water damage, indoor air quality, lighting, and the HVAC system. These concerns are discussed in detail in Section 2.0 of this report.

TABLES

Table 1
Wipe Sampling for Lead
National Guard Armory
Wilmington, Delaware
Date of Sampling: 26 June 2003 and 3 October 2003

Sample Number	Location	Results, $\mu g/ft^2$ [a]
DEWIL276-1	Kitchen – Top of Mixer	60
DEWIL276-2	Assembly Hall – Top of Locker	39
DEWIL276-3	Assembly Hall – Top of Cabinet	210
DEWIL276-4	Assembly Hall – Top of Locker	660
DEWIL276-5	MSG Non-Responsive Office	9.6
DEWIL276-6	Field Blank	0.72 µg
DEWIL177-1	Assembly Hall – On Floor	< 23
DEWIL177-2	Assembly Hall – On Floor	< 23
DEWIL177-3	Assembly Hall – On Floor	< 23
DEWIL177-4	Assembly Hall – On Floor	< 23
DEWIL177-5	Assembly Hall – On Floor	< 23 µg
DEWIL177-6	Field Blank	3.9
DEWIL177-7	Dining Room Table	10
DEWIL177-8	Women's Restroom Heater	12
DEWIL177-9	Emergency Operations Center Counter	84
DEWIL177-10	Copier Room Filing Cabinet	7.2
DEWIL177-11	Supply Room Cabinet	< 0.3 µg
DEWIL177-12	Field Blank	14
DEWIL177-13	Non-Responsive Office Desk	5.4
DEWIL177-14	COB 280th Desk	5.3
DEWIL177-15	S-4 198th Desk	6.6
DEWIL177-16	BCO Exit Node Platoon (Room 202) Filing Cabinet	8.4
DEWIL177-17	204 Cable and Wire Platoon Desk	< 0.3 µg
DEWIL177-18	Field Blank .	

[a] Micrograms lead per square foot

The samples were taken and analyzed in accordance with the Instructions for *Completing the Sampling of ARMY National Guard Armories* procedure.

Table 2
Breathing Zone Air Samples for Lead
National Guard Armory
Wilmington, Delaware
Date of Sampling: 26 June 2003

Sample Number	Employee	Sampling Information			Results (mg/m^3) [a]
		Time Sampled / Minutes	Flow Rate (lpm) [b]	Volume (liters)	
DEWIL177-A1	Non-Responsive	0939-1033 / 54	2.478	133.81	<0.007
DEWIL177-A2	Non-Responsive	0940-1053 / 73	2.487	181.55	<0.006
DEWIL177-A3	Field Blank	-	-	-	None Detected

[a] Milligrams lead per cubic meter of air.
[b] Liters of air per minute.

Method 7082 of the National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods was followed for sampling for lead.

Table 3
Indoor Air Quality Measurements for Carbon Dioxide, Humidity, and Temperature
National Guard Armory
Wilmington, Delaware
Date of Sampling: 26 June 2003

Location	Occupants in Area	Carbon Dioxide, parts per million parts of air (ppm)	Percent (%) Humidity	Temperature (°F)
1st Floor - Drill Floor	2	391	61.0	84.9
2nd Floor - Cable & Wire Platoon	2	428	62.8	87.3
Outdoors	-	430	63.3	89.8

Carbon dioxide, humidity, and temperature measurements were taken with a TSI Q Trak Plus, Model 8554, Indoor Air Quality Meter, calibrated in April 2003.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommends that indoor carbon dioxide levels be less than 700 ppm above outdoor levels.

ASHRAE recommends that the relative humidity levels be maintained between 30 to 60 percent.

ASHRAE recommends that the acceptable temperature range be 68 degrees Fahrenheit to 74 degrees Fahrenheit in the winter and 73 degrees Fahrenheit to 79 degrees Fahrenheit in the summer.

Table 4
Illumination Readings
National Guard Armory
Wilmington, Delaware
Date of Sampling: 26 June 2003

Location	Luminance (fc)[a]	Standard (fc)[a]	Standard Met
Drill Floor	35.7 – 124.5	70	Some Areas
Lobby	9.9-72.1	7.5	Yes
Women's Restroom	3.7-58.5	40	Some Areas
Corridor	8.6-105.3	7.5	Yes
Training Room	2.3-110.1	70	Some Areas
Stairwell	2.4-113.7	7.5	Some Areas
Copier Room	6.7-81.3	70	Some Areas
Office Area – Room 111	24.7-59.8	70	No
Supply Room	2.4-103.7	70	Some Areas
2nd Floor Corridor	2.4-115.0	7.5	Some Areas
2nd Floor Cable & Wire Platoon Office – Room 204	10.8-154.8	70	Some Areas
2nd Floor 198 Batallion Office	21.7-151.3	70	Some Areas
2nd Floor Office – Room 202	18.9-198.7	70	Some Areas

[a] fc - Footcandles

The readings were taken with a Cooke Corporation cal-LIGHT 400 Calibrated Precision Lightmeter, calibrated on 19 Aug 2002.

The standards listed above are from Design Guide DG-415-2, Logistics Facilities, published by the National Guard Bureau Installation Division.

Appendix A
HHIM Data Form

HEALTH HAZARD INFORMATION MODULE: INDUSTRIAL HYGIENE SURVEY

(For use of this form, see HHIM User's Guide)

SECTION 1. DEMOGRAPHIC DATA

ARLOC: 42394	INSTALLATION: RC, 198th Regt	BLDG/RM NO.: Wilmington
LOCATION/CODE: Administrative Areas/AA	OPERATION/CODE: Administrative Operations/ADO	
SURVEY DATE: 26 June 03	EVALUATOR (Initials): AG	
MACOM/CODE: 7A	SUBMACOM/CODE: XX	SUPERVISOR: Non-Responsive
TELEPHONE/DSN NO.: (302)326-7240	UNIT/ORGANIZATION: National Guard	RAC: 5 / FREQUENCY (hrs/day): 8
NO. CIV(S)	NO. MIL: 11 / NO. CONTRACTOR(S) / NO. LOC(S) / NO. OTHER	

SECTION 2. FACILITY DATA

LAB HOODS: 0	VAPOR DEGREASERS: 0	SPRAY BOOTHS: 0
MAINTENANCE BAYS: 0	OPEN SURFACE TANKS: 0	VENTILATION UNITS: 8

SECTION 3. SURVEY DATA

CONTROLS PRESENT	EVALUATION	UNIT CODE	CONTROLS REQUIRED	STATUS

PERSONAL PROTECTIVE EQUIPMENT (R = Required; U = Utilized)

GLOVES	R/U	RESPIRATOR	NIOSH TC NO.	MANUFACTURER	R/U
ACID	/	AIRLINE			/
COLD SURFACES	/	ABRASIVE BLASTING HOOD			/
HOT SURFACES	/	DISPOSABLE			/
NBC AGENTS	/	FULL FACE AIR PURIFYING			/
OIL	/	1/2 FACE AIR PURIFYING			/
SOLVENTS	/	POWERED AIR PURIFYING			/
SURGICAL GLOVES	/	1/4 FACE AIR PURIFYING			/
		SELF CONTAINED			

EYES/FACE	R/U	HEARING	R/U	BODY	R/U	HEAD/FIT	R/U
CHEMICAL SPLASH	/	CANAL CAPS	/	APRONS	/	COLD WEATHER BOOTS/HATS	/
FULL FACE SHIELD	/	EARPLUGS	/	COLD WEATHER CLOTHING	/	HARD HATS	/
CHEMICAL/SAFETY	/	HELMETS	/	COVERALLS	/	IMPERMEABLE BOOTS	/
SAFETY/IMPACT	/	MUFFS	/	FULL BODY SUIT	/	SAFETY/CONDUCTIVE SHOES	/
WELDING HELMET	/	MUFF/EARPLUG COMBO	/	HEAT REFLECTIVE VEST/SUIT	/	SAFETY/NON-CONDUCTIVE SHOES	/
		MUFF/EARPLUG W/TIME LIMIT	/	SAFETY BELT/HARNESS	/		

Attach 4

SECTION 4. HAZARD INVENTORY DATA

CAS CODE	HAZARD DESCRIPTION	PAC	EPC
POVDTXXXX	Video Display Terminal	3-Low	D- Uncontrolled Physical
7439-92-1	Lead, Inorganic Dusts & Fumes	2-Moderate	C- Uncontrolled Respiratory
1332-21-4	Asbestos (Other)	2-Moderate	C- Uncontrolled Respiratory

SECTION 5. PERSONNEL DATA

	MI	SEX	SSN	CATEGORY
		M		MIL
	K	M		MIL
	A	M		MIL
	R	F		MIL
	L	M		MIL
	B	F		MIL
	A	F		MIL
		M		MIL
	C	M		MIL

[redacted] Non-Responsive

MMENTS

☐ No comments ☐ See attached sheet

Survey conducted by Ms. Non-Responsive. There are 11 full-time employees present at the facility.

PRIVACY ACT STATEMENT

Title 5 US Code, Section 301; Executive Order 9397 authorizes the use of your Social Security Number as an identification number. The purpose of this information is to identify and monitor data relating each DA civilian and military employee exposed to a hazardous workplace or operation. The use of this information is to provide histories of exposures for any given worker.

Disclosure of your Social Security Number is not mandatory; however, nondisclosures may result in untimely provision of proper medical monitoring.

Employees perform mainly administrative functions.

(Please see attached sheet for additional employees) Attach 4

SECTION 4. HAZARD INVENTORY DATA

CAS CODE	HAZARD DESCRIPTION	PAC	EPC

SECTION 5. PERSONNEL DATA

LAST NAME	FIRST NAME	MI	SEX	SSN	CATEGORY
[redacted]		L	M		M/L
[redacted]		M	F		M/L

Non-Responsive

SECTION 6. COMMENTS

☐ No comments ☐ See attached sheet

PRIVACY ACT STATEMENT

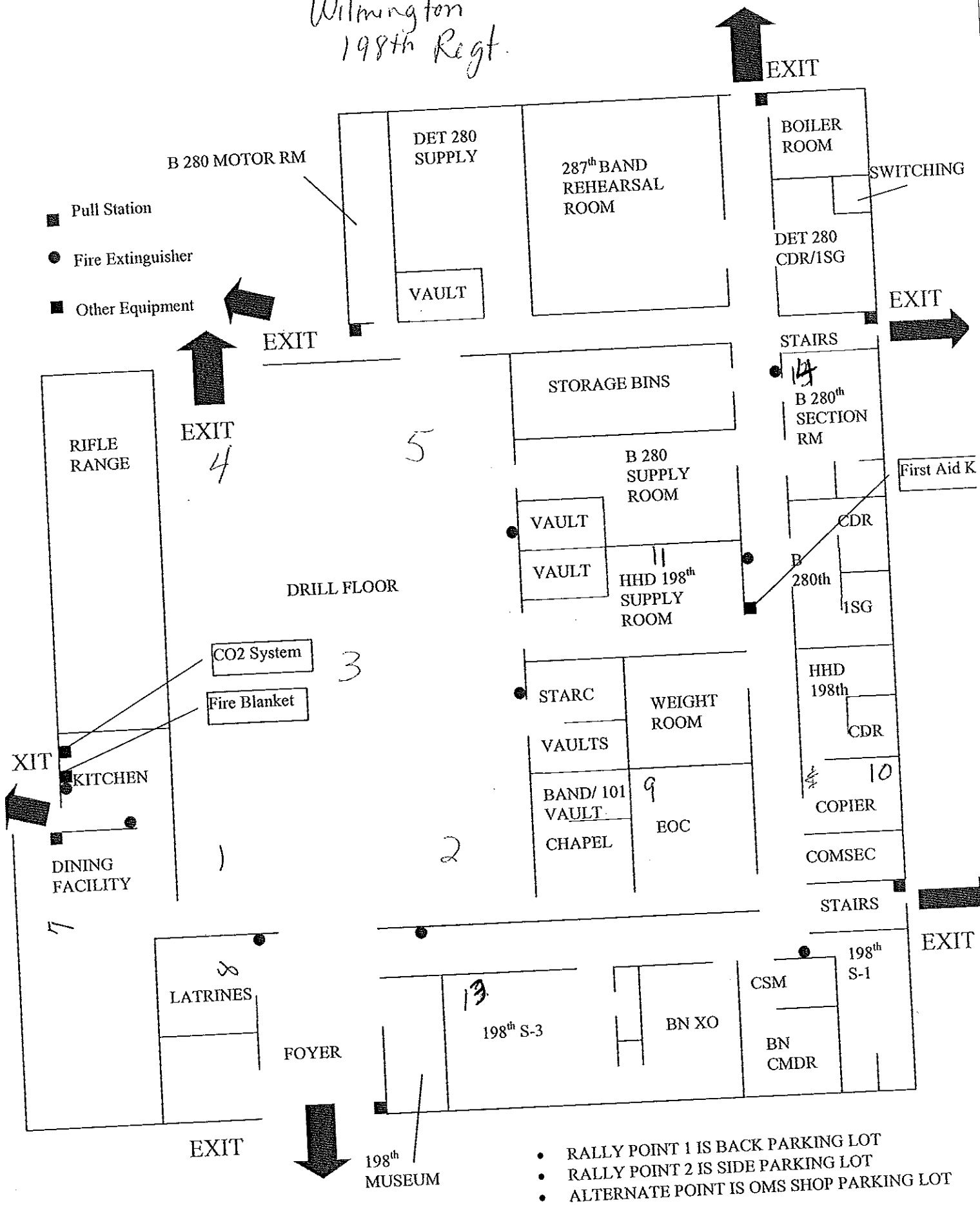
Title 5 US Code, Section 301; Executive Order 9397 authorizes the use of your Social Security Number as an identification number. The purpose of this information is to identify and monitor data relating each DA civilian and military employee exposed to a hazardou workplace or operation. The use of this information is to provide histories of exposures for any given worker.

Disclosure of your Social Security Number is not mandatory; however, nondisclosures may result in untimely provision of proper medical monitoring.

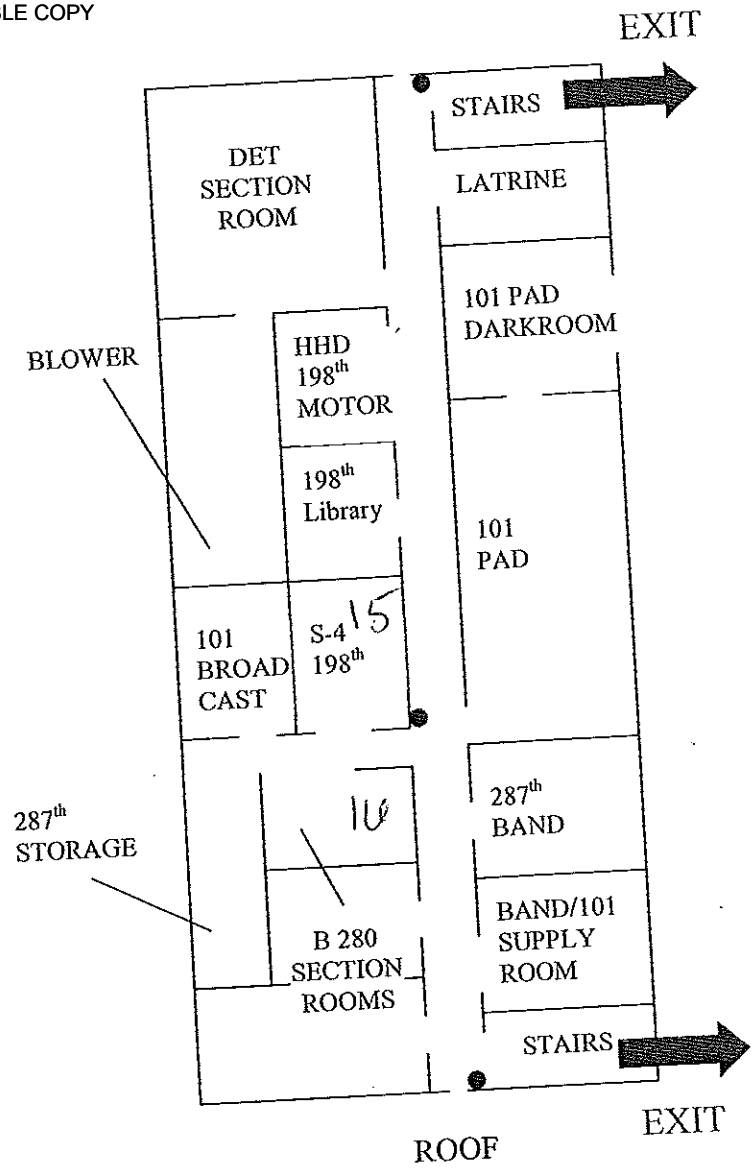
Attach 4

Appendix B
Building Layout

Wilmington
198th Regt.



- RALLY POINT 1 IS BACK PARKING LOT
- RALLY POINT 2 IS SIDE PARKING LOT
- ALTERNATE POINT IS OMS SHOP PARKING LOT



- RALLY POINT 1 IS BACK PARKING LOT
- RALLY POINT 2 IS SIDE PARKING LOT
- ALTERNATE POINT IS OMS SHOP PARKING LOT

Appendix C
Sampling Sheets and Laboratory Analyses

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client: National Guard Bureau
Address: 301-IH Old Bay Lane. Attn: NGB-AVN-SI, State Military Reservation
Havre de Grace, Maryland 21078

Job Name: Delaware National Guard Survey
Job Location: Wilmington, 198th
Job Number: Not Provided
P.O. Number: 1002

Chain Of Custody: 118602
Date Analyzed: 10/15/2003
Person Submitting: [redacted]
Report Date: 15-Oct-03

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0401641	DEWIL276-1	Furnace	Wipe	****	0.111	13.50	ug/ft²	60	ug/ft²	
0401642	DEWIL276-2	Furnace	Wipe	****	0.111	13.50	ug/ft²	39	ug/ft²	
0401643	DEWIL276-3	Furnace	Wipe	****	0.111	33.75	ug/ft²	210	ug/ft²	←
0401644	DEWIL276-4	Furnace	Wipe	****	0.111	67.51	ug/ft²	660	ug/ft²	←
0401645	DEWIL276-5	Furnace	Wipe	****	0.111	2.70	ug/ft²	9.6	ug/ft²	
0401646	DEWIL276-6	Furnace	Wipe Blank	****	N/A	0.30	ug	0.72	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B
N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)
%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Analyst: [redacted] Non-Responsive **Technical Manager:** [redacted]

An AIHA (#8863), NVLAP (# 101143), & New York ELAP (#10920) Accredited Laboratory
4475 Forbes Blvd. • Lanham, MD 20706 • (301) 459-2640 • Toll Free (800) 346-0961 • Fax (301) 459-2643

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

NVLAP
NY ELAP
AIHA

CERTIFICATE OF ANALYSIS

Client: National Guard Bureau
Address: 301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation, Havre de Grace, Maryland 21078

Job Name: Delaware
Job Location: 198th
Job Number: Not Provided
P.O. Number: 10-07

Chain Of Custody: 119007
Date Analyzed: 11/12/2003
Person Submitting: [redacted]
Report Date: 12-Nov-03

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0407527	DEWIL177-7	Furnace	Wipe	****	0.111	2.70	ug/ft²	3.9	ug/ft²	
0407528	DEWIL177-8	Furnace	Wipe	****	0.111	2.70	ug/ft²	10	ug/ft²	
0407529	DEWIL177-9	Furnace	Wipe	****	0.111	2.70	ug/ft²	12	ug/ft²	
0407530	DEWIL177-10	Furnace	Wipe	****	0.111	13.50	ug/ft²	84	ug/ft²	
0407531	DEWIL177-11	Furnace	Wipe	****	0.111	2.70	ug/ft²	7.2	ug/ft²	
0407532	DEWIL177-12	Furnace	Wipe Blank	****	N/A	0.30	ug	< 0.3	ug	
0407533	DEWIL177-13	Furnace	Wipe	****	0.111	2.70	ug/ft²	14	ug/ft²	
0407534	DEWIL177-14	Furnace	Wipe	****	0.111	2.70	ug/ft²	5.4	ug/ft²	
0407535	DEWIL177-15	Furnace	Wipe	****	0.111	2.70	ug/ft²	5.3	ug/ft²	
0407536	DEWIL177-16	Furnace	Wipe	****	0.111	2.70	ug/ft²	6.6	ug/ft²	
0407537	DEWIL177-17	Furnace	Wipe	****	0.111	2.70	ug/ft²	8.4	ug/ft²	
0407538	DEWIL177-18	Furnace	Wipe Blank	****	N/A	0.30	ug	< 0.3	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids ; EPA 600/R-93/200(M)-7421; Water: SM-3113B
N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)
%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Analyst: [redacted]

Technical Manager: [redacted]

NVLAP (#101143) & New York ELAP (#10920) Accredited Laboratory

Reservoirs Environmental, Inc.
2059 Bryant St. Denver, CO 80211
(303) 964-1986 Fax (303) 477-4275 Toll Free (866) RESI-ENV

July 10, 2003

Project Description:
RES 94962-1
06-08
Delaware-Wilmington

Non-Responsive
Shaw Environmental, Inc.
312 Directors Drive
Knoxville TN 37923

Dear Customer,

Reservoirs Environmental, Inc. is an environmental analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the American Industrial Hygiene Association, Lab ID 101533 - Accreditation Certificate #480. The laboratory is currently proficient in both PAT & ELPAT programs respectively.

Reservoirs has analyzed the following sample(s) using Atomic Absorption (AA) / Atomic Emission Spectroscopy - Inductively Coupled Plasma (AES-ICP) per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in Table I. Results have been faxed to your office.

RES 94962-1 is the job number assigned to this study. This report is considered highly confidential and property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those authorized by the client. Samples will be disposed of after sixty days unless longer storage is requested. If you should have any questions about this report, please feel free to call me at 303-964-1986.

Sincerely,

Non-Responsive

President

RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Accredited Laboratory #101896
AIHA Certificate of Accredidation #480 LAB ID 101533

TABLE I. ANALYSIS: LEAD BY WIPE SAMPLING

RES Job Number:	RES 94962-1
Client:	Shaw Environmental, Inc.
Client Project Number / P.O.:	06-08
Client Project Description:	Delaware-Wilmington
Date Samples Received:	July 3, 2003
Analysis Type:	USEPA SW846 3050B / AA(7420)
Turnaround:	3-5 Day
Date Samples Analyzed:	July 10, 2003

Client ID Number	Lab ID Number	Sample Area (sq.ft.)	LEAD (µg)	Detection Limit (µg/sq.ft.)	LEAD CONCENTRATION (µg/sq.ft.)
DEWILM177-1	EM 791278	0.11	BDL	23	BDL
DEWILM177-2	EM 791279	0.11	13.7	23	125
DEWILM177-3	EM 791280	0.11	5.0	23	45
DEWILM177-4	EM 791281	0.11	5.5	23	50
DEWILM177-5	EM 791282	0.11	BDL	23	BDL
DEWILM177-6	EM 791283	0.11	BDL	23	BDL
DEWIL177-1	EM 791284	0.11	BDL	23	BDL
DEWIL177-2	EM 791285	0.11	BDL	23	BDL
DEWIL177-3	EM 791286	0.11	BDL	23	BDL
DEWIL177-4	EM 791287	0.11	BDL	23	BDL
DEWIL177-5	EM 791288	0.11	BDL	23	BDL
DEWIL177-6	EM 791289	0.11	BDL	23	BDL
DEWIL177-19	EM 791290	0.11	45000.0	23	409091
DEWIL177-20	EM 791291	0.11	98300.0	23	893636
DEWIL177-21	EM 791292	0.11	3160.0	23	28727
DEWIL177-22	EM 791293	0.11	8060.0	23	73273

*Calculations Based On A 1 sq.ft. Sample Area Unless Otherwise Noted

* Sample DEWIL177-6 results may be dastically low due to cracked digestion vessel.

Data Qa

BDL = Below Detection Limit

RESERVOIRS ENVIRONMENTAL, INC.

2059 Bryant St., Denver CO 80211

RES 94962

Due Date: 2-9-11

RESI Job #:

Due Time: 10:05

Page 1 of 2

SAMPLES SUBMITTED BY:		INVOICE TO: (IF DIFFERENT)	
Company:	Shaw Environmental, Inc.	Non-Responsive	
Address:	312 Directors Drive	Army National Guard (H-W	
	Knoxville, TN 37923	301-H Old Bay Ln, Havre de Grace, MD 21078	
Contact:	Non-Responsive	Phone: (302)359-3736	Fax: (410)436-2163 Pager:
Contact:		Phone:	Fax: Pager:
Project Number and/or P.O. #:	06-08	Final Data Deliverable Email Address:	
Project Description/Location:	Delaware - Wilmington	Non-Responsive	

After Hours/Weekend CHARGE: Amount $_____ Authorized by: _____

Additional fees apply for after hours and holidays for all analysis types. Samples will be analyzed during normal laboratory hours unless otherwise arranged and specified on the chain of custody. Turnaround is subject to laboratory volume. You will be notified if delays are expected.

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm

PCM/PLM ___ 2 Hour RUSH ___ 24 hour ___ 3-5 weekdays

TEM ___ 6 Hour RUSH ___ 24 hour ___ 3-5 weekdays

Prior Notice REQUIRED for TEM 6 Hour RUSH

METALS LABORATORY HOURS: Weekdays: 8am - 5pm

AA ___ SPECIAL RUSH ___ 24 Hour X 3-5 Day

RCRA 8 ___ SPECIAL RUSH ___ 5 Day ___ 10 Day

TCLP ___ SPECIAL RUSH ___ 5 Day ___ 10 Day

Prior Notice REQUIRED for SPECIAL RUSH AA, RCRA or TCLP

RCRA and TCLP SPECIAL RUSH is 3 Day Turnaround

ANALYTICAL METHOD

AIR
- [ ] PCM 7400A, 7400B, OSHA
- [ ] TEM AHERA, Level II, 7402, ISO, Pres/Abs ISO-Indirect Preps Chatfield
- [ ] AA / ICP _____ Metal _____ RCRA 8
- [ ] Dust Total, Respirable

BULK:
- [ ] PLM Short report, Long report, Point Count
- [ ] TEM +/-, Quant, Semi-quant
- [x] AA / ICP _____ Metal _____ RCRA 8
- Paint, Soil, Dust, (Wipe) TCLP
- (ASTM E 1792 approved wipes only.)

WATER
- [ ] TEM Drinking, Waste Water
- [ ] AA Water _____ Metal _____ RCRA 8
- Drinking, Waste Water

OTHER [ ] Specify _____

Special Instructions: Please report in ft 2. Contract # 76-267. Email results to kenneth.forsythe@md.ngb.army.mil

	Client Sample Number	Volume (4 x 4" wipes)	EM #
1.	DEWILMITT-1		79078
2.	" -2		79
3.	" -3		80
4.	" -4		81
5.	" -5		82
6.	" -6		83
7.	DEWILITT-1		84
8.	-2		85
9.	-3		86
10.	-4		87
11.	-5		88
12.	-6		89
13.	-19		90
14.	-20		91
15.	-21		92

Number of samples received: 16 (Use as many additional sheets as needed.)

NOTE: If the package has sustained substantial damage or the custody seal is broken, stop and contact project manager and shipper. RESI will analyze incoming samples based upon information received with those samples. RESI is not responsible for errors or omissions in calculations resulting from the inaccuracy of original data. Turnaround times are based upon times of receipt [illegible] of samples guaranteed in short turnaround.

Relinquished By: Non-Responsive Date/Time: 7/1/03 8:00pm

Laboratory Use Only

Received By: Non-Responsive Date/Time: 2-8-04 10:05

Carrier: [illegible] of package/custody seal upon receipt:

RESULTS: Contact / Page Phone Fax Email Date Time Initials

SPLITS:	Authorization By/Time:	Lab Bench/Count Sheets Received By:
	Analytical Method/Turnaround:	Time: Date:
rev 5/2/01	Results Due: Results Out:	

Phone: (303) 864-1936 Fax: (303) 477-4275 WATS: 1-866-RESI ENV (737-4368)
PAGER: ONCALL Pager number available at Lab. Alternate Pagers: PLM/TEM 509-2187 PCM/Metals 509-2098 (AFTER HOURS USE ONLY)

RESERVOIRS ENVIRONMENTAL, INC.

2059 Bryant St., Denver CO 80211

RESI Job #: 99662

Due Date: 24 7/11

Page 2 of 2

Due Time: 10:00

SAMPLES SUBMITTED BY:	
Company	Shaw Environmental, Inc.
Address	312 Directors Drive
	Knoxville, TN 37923
Contact	[redacted] Phone: (302)369-3736
Contact	Phone
Project Number and/or P.O. #:	06-08
Project Description/Location:	Delaware - Wilmington

INVOICE TO: (IF DIFFERENT)	
[redacted]	
Army National Guard ILW	
301-B Old Bay Ln, Havre de Grace, MD 21078	
Fax: (410)436-2163	Pager
Fax	Pager
Final Data Deliverable Email Address:	
[redacted]	

After Hours/Weekend CHARGE: Amount $____ Authorized by: ____

Additional fees apply for after hours and holidays for all analysis types. Samples will be analyzed during normal laboratory hours unless otherwise arranged and specified on the chain of custody. Turnaround is subject to laboratory volume. You will be notified if delays are expected.

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm

PCM/PLM __ 2 Hour RUSH __ 24 hour __ 3-5 weekdays

TEM __ 6 Hour RUSH __ 24 hour __ 3-5 weekdays

Prior Notice REQUIRED for TEM 6 Hour RUSH

METALS LABORATORY HOURS: Weekdays: 8am - 6pm

AA __ SPECIAL RUSH __ 24 Hour X 3-5 Day

RCRA 8 __ SPECIAL RUSH __ 5 Day __ 10 Day

TCLP __ SPECIAL RUSH __ 5 Day __ 10 Day

Prior Notice REQUIRED for SPECIAL RUSH AA, RCRA or TCLP

RCRA and TCLP SPECIAL RUSH is 3 Day Turnaround

ANALYTICAL METHOD

AIR: [ ] PCM 7400A, 7400B, OSHA; TEM AHERA, Level II, 7402, ISO, Prep/Abs ISO Indirect Preps, Chatfield; [ ] AA / ICP __ Metal __ RCRA 8; Dust, Total, Respirable

BULK: [ ] PLM Short report, Long report, Point Count; [ ] TEM Qual., Quant., Semi-quant; [X] AA / ICP __ Metal __ RCRA 8; Paint, Soil, Dust, (Wipe) TCLP (ASTM E 1792 approved wipes only)

WATER: [ ] TEM Drinking, Waste Water; [ ] AA Water __ Metal __ RCRA 8; Drinking, Waste Water

OTHER: [ ] Specify __

Special Instructions: Please report in ft 2. Contract # 78-287. Email results to kenneth.forsythe@rad.ngb.army.mil

	Client Sample Number	Volume	EM #
1.	DEWILI77-22	4 x 4" wipe	791893
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

Number of samples received: 16 (Use as many additional sheets as needed.)

NOTE: If the package has sustained substantial damage or the custody seal is broken, stop and contact project manager and shipper. RESI will analyze incoming samples based upon information received with those samples. RESI is not responsible for errors or omissions in calculations resulting from the inaccuracy of original data. Turnaround times are based upon time of re[redacted] of samples guaranteed in short turnaround.

Relinquished By: [redacted] Date/Time: 7/1/03 4:00 pm

Laboratory U[redacted] Date/Time: 7/3/03 10:00

Received By: [redacted] of package/custody seal upon receipt.

Carrier:

RESULTS: Phone Fax Email Date Time Initials

SPLITS: Authorization By/Time: Analytical Method/Turnaround: Results Due: Results Out:

Lab Bench/Count Sheets Received By: Time: Date:

Rev 5/7/01

Phone: (303) 964-1986 Fax: (303) 477-4275 WATS: 1-866-RESI ENV (737-4368)

PAGER: ONCALL Pager number available at Lab. Alternate Pagers: PLM/TEM 509-2187 PCM/Metals 509-2088 (AFTER HOURS USE ONLY)

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
312 Directors Drive
Knoxville, TN 37923

Reference Data:	
Client Sample No.:	Lead DEGE0178-A1 through DEWIL177-A3
P.O. No.:	06-07
Sample Location:	DE
Sample Type:	Filter
Method Reference:	NIOSH 7300
DCL Set ID No.:	03-S-3222
DCL Sample ID No.:	03-20046 through 03-20055
Sample Receipt Date:	7/3/2003
Preparation Date:	07/07/03
Analysis Date:	07/07/03

The samples were prepared and analyzed in accordance with NIOSH method 7300 using a Perkin Elmer 3000XL ICP.

The sample condition upon receipt was acceptable except where noted.

The results are in the enclosed data table. Results relate only to the items tested and are not blank corrected unless indicated in the data table.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Non-Responsive
Analyst

Non-Responsive
Reviewer

CINCINNATI OFFICE
4388 GLENDALE-MILFORD ROAD
CINCINNATI, OHIO 45242-3706
513 733-5336, FAX 513 733-5347

WEST COAST OFFICE
11 SANTA YORMA COURT
NOVATO, CALIFORNIA 94945
800 260-8071, FAX 415 893-9469

Results
Lead

Client #	DCL #	Sample Volume (L)	µg/sample	mg/m³
DEGE0178-A1	03-20046	133.35	ND	<0.007
DEGE0178-A2	03-20047	125.25	ND	<0.008
DEGE0178-A3	03-20048	0	ND	-
DEWIL177-A1	03-20053	133.81	ND	<0.007
DEWIL177-A2	03-20054	181.55	ND	<0.006
DEWIL177-A3	03-20055	0	ND	-
	Prep Blank		ND	
% Recovery	LCS		104.	
RPL			1.	

ND = not detected at or above the reporting limit (RPL).
LCS = laboratory control sample.

Non-Responsive [redacted]
Analyst

Non-Responsive [redacted]
Reviewer

DATA CHEM LABORATORIES

ANALYTICAL REQUEST FORM

1. X REGULAR Status

RUSH Status Requested - ADDITIONAL CHARGE

RESULTS REQUIRED BY _____ DATE

CONTACT DATACHEM LABS PRIOR TO SENDING SAMPLES.

2. Date 6/30/03 Purchase Order No. 06-07

3. Company Name Shaw Environmental, Inc.

Address 312 Directors Drive

Knoxville, TN 37923

Person to Contact [redacted]

Telephone (308) 369-3736

Fax Telephone (410) 456-2163

Billing Address (if different from above)

[redacted] Army National Guard 1H-W

301-1H, Old Bay Lane, Havre de Grace, MD 21078

4. Quote No. _____

DCL Project Manager _____

5. Sample Collection

Sampling Site DE

Industrial Process _____

Date of Collection 6/27/03, 6/26/03

Time Collected Various

Date of Shipment 7/1/03

Chain of Custody No. [redacted]

6. REQUEST FOR ANALYSES 03-52-3222

Laboratory Use Only	Client Sample Number	Media Type*	Sample Volume (Liters)	ANALYSES REQUESTED - Use Method Number if Known
20046	DEGF0178-A1	MCEF	133.35	Lead
20047	" -A2	1	125.25	1
20048	" -A3	1	Blank	1
20049	" -PC1	/	Bulk	1
20050	" -PC2	/	1	1
20051	" -PC3	/	1	1
20052	" -PC4	/	1	1
20053	DEWI6177-A1	MCEF	133.81	1
20054	" -A2	1	181.55	1
20055	" -A3	1	Blank	1

*Specify: Solid sorbent tube, e.g. Charcoal; Filter type; Impinger solution; Bulk Sample; Blood; Urine; Tissue; Soil; Water; Other

7. Q C REQUIREMENTS
MUST BE COMPLETED FOR ENVIRONMENTAL SAMPLES - See General Services Terms and Conditions: QC samples billed at regular sample rate

☐ METHOD QC SAMPLES (Lab QC according to published methods)
☐ PROJECT PLAN QC SAMPLES (Lab QC according to provided QA/QC Plan)
☐ NO QC SAMPLES REQUESTED (May not conform to Agency requirements)
☐ OTHER (as specified below)

[redacted] 7/1/03 0951

Comments Please email results to [redacted], or fax to his attention at (410) 942-0254.

Possible Contamination and/or Chemical Hazards

8. Requested b[redacted]

960 West LeVoy Drive / Salt Lake City, UT 84123 800-356-9135 or 801-266-7700 / Fax: 801-268-9992
4388 Glendale-Milford Road / Cincinnati, OH 45242 800-458-1493 or 513-733-5336 / Fax: 513-733-5347

DATACHEM LABORATORIES - A SORENSON COMPANY

DISTRIBUTION: WHITE - LABORATORY COPY CANARY - CUSTOMER COPY

JUL 22 '03 11:45 5134936268

&14Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory **Location:** Wilmington, RC 198th Regt

Date: 6/26/03

Sample 1

Sample Number: DEWIL177-A1

Pump: 648339

	Pre Flow Rate	Post Flow Rate
	2.486	2.471
	2.480	2.475
	2.478	2.472
	2.476	2.465
Average	2.480	2.471

Average Pre and Post 2.478 L/min

2.478 $\frac{L}{min}$ × 54 min =

Time 1 9:39

Time 2 10:33

Total Time Sampled

Minutes Sampled 54 min

Liters

Volume 133.81

Sample 2

Sample Number: DEWIL177-A2

Pump: 647615

	Pre Flow Rate	Post Flow Rate
	2.496	2.482
	2.491	2.484
	2.492	2.477
	2.495	2.484
Average	2.491	2.482

Average Pre and Post 2.487 L/min

2.487 $\frac{L}{min}$ × 73 min =

Time 1 9:40

Time 2 10:53

Total Time Sampled

Minutes Sampled 73 min

Liters

Volume 181.55

Appendix D
References

References

Title 29, Code of Federal Regulations CFR), Part 1910, Occupational Safety and Health Administration (current edition)

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc (ASHRAE) 62-2002, Ventilation for Acceptable Indoor Air Quality

Instructions for Completing the Sampling of ARMY National Guard Armories, Lead Wipe Sampling Procedure included with the Request for Proposal

Air Sampling for Lead - Method 7082 of the National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods

Design Guide DG-415-2, Logistics Facilities, National Guard Bureau Installation Division, 14 December 1999

Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998

Army Regulation (AR) 40-5, Medical Service, Preventative Medicine, 15 October 1990

AR 385-10, The Army Safety Program, 29 February 2000

Department of the Army Pamphlet (DA PAM) 40-501, Medical Services, Hearing Conservation Program, 10 December 1998

DA PAM 40-503, Medical Services, Industrial Hygiene Program, 30 October 2000

Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH) (current edition)

Guidelines for Converting Indoor Firing Ranges to Other Uses, Headquarters, Department of the Army and the Air Force, NG PAM (AR) 385-16/ANGPAM 91-101, 31 January 1994

Appendix D
References

References

Title 29, Code of Federal Regulations CFR), Part 1910, Occupational Safety and Health Administration (current edition)

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc (ASHRAE) 62-2002, Ventilation for Acceptable Indoor Air Quality

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Appendix E
Recommendations for
Surface Lead Dust in Armories

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot (□g/ft^2). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 µg/ft²) and windowsills (250 µg/ft²) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 □g/ft^2 in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 □g/ft^2 is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

Industrial Hygiene Survey Report

National Guard Facility
Colonel S.B.I Duncan Readiness Center

Prepared For:	**National Guard Bureau Region North IH** **301-IH Old Bay Lane** **Havre de Grace, MD 21078**
Survey Location:	**Colonel S.B.I Duncan Readiness Center** **41 Corporate Circle** **New Castle, DE 19720**
Prepared By:	**ALS Environmental** **3544 North Progress Avenue** **Suite 100** **Harrisburg, PA 17110**
Survey Date:	**October 12, 2011**
Report Date:	**November 14, 2011**
ALS Project #:	**1110755**

Non-Responsive

Director, Industrial Hygiene Services

Table of Contents

Section 1.0
Executive Summary

Section 1.0 Executive Summary

An industrial hygiene survey was conducted on October 12, 2011, at the Colonel S.B.I Duncan Readiness Center located at 41 Corporate Circle, New Castle, DE 19720. The survey was performed by Ms. Non-Responsive

1. Lead surface and air samples were collected. Surface levels of lead exceeded 200 micrograms per square foot (ug/ft^2) in three locations. Cleaning procedures should be improved and remedial action should be taken to maintain lead levels below 200 ug/ft^2. See Section 3.0 for sampling results.

2. Lighting levels did not meet the American National Standard Institute/Illuminating Engineering Society of North America (ANSI/IESNA) recommended guideline in some areas. See Section 4.0 for locations.

3. Indoor air quality (IAQ) parameters of temperature, relative humidity, carbon monoxide and carbon dioxide (ventilation) were evaluated during the assessment. Relative humidity levels in all areas were above The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation, recommendation. Relative humidity should be maintained at 30 - 60%. The heating, ventilating, and air conditioning system (HVAC) system should be inspected to ensure it is working properly.

4. Some water damaged ceiling tiles were observed throughout the facility. Visible fungal growth was observed on the flexible thermal foam pipe insulation in the 126th Supply Room (Approximately 50LF). Identify and repair the source of the water infiltration. Fungal growth should be properly remediated. Replace any water stained ceiling tiles.

5. The HVAC supply and return grills located in some of the offices and classrooms were observed to be dirty with possible fungal growth. These should be cleaned. Do not permit dirt, debris, microbial growth, etc. to accumulate in any portion of the HVAC system. It was reported that HVAC unit that services the Drill Hall was not operational and has not functioned in decades.

Section 2.0
Operation Description & Observations

Section 2.0 Operation Description & Observations

The Colonel S.B.I Duncan Readiness Center is mainly an administrative facility with a drill hall, offices, classrooms and storage areas. There were approximately 5 full-time employees stationed at this facility at the time of this survey.

The building was initially constructed in 1960's. There have been some renovations since its construction. The building is two stories with a brick exterior. The interior walls are primarily concrete block. The floors are concrete with vinyl floor tile.

There is a central HVAC system present in the facility. HVAC units service the building via a boiler fired heat pump. It was reported that the HVAC unit in the Drill Hall has not worked in decades.

The firing range has been converted into a gym. The bullet trap and ballasts remain. The area appears very clean and well kept.

There is no child-care facility in the building.

Overall housekeeping practices were good. Areas were clean and well kept.

No ergonomic concerns were reported. Office areas have computer work stations. Work stations appeared properly designed. Personnel had supportive chairs.

Section 3.0
Lead Testing

Section 3.0 Lead Testing

Due to the age of the building there is the potential for lead based paint to be present. Various surfaces within the facility were screened for lead using surface/wipe samples. Surface/wipe samples were collected in accordance with the American Society for Testing and Materials (ASTM) E 1792 protocols. Air samples were collected using 0.8 um mixed cellulose ester (MCE) filter cassettes attached to low volume air sampling pumps. Blank samples were submitted to the laboratory for quality control purposes. Samples were sent to AMA Analytical Services, Inc., in Lanham, Maryland, for lead analysis using Environmental Protection Agency (EPA) Method 600/R-93/200 (M)-7420. A copy of the laboratory analysis report can be found in Appendix A.

Lead Testing Results Summary

Sample #	Location	Air ug/m^3	Surface ug/ft^2
1	Drill Hall	<5.7	*
2	Conference Room	<5.7	*
3	Blank	<3 (ug)	*
4	Drill Hall – Kitchen Metal Shelf	*	<110
5	Drill Hall – Display Case	*	<110
6	Drill Hall – Floor by Supply Room	*	<110
7	Drill Hall – Med Clinic Supply Grill	*	<110
8	Drill Hall – Floor by Garage Door	*	<110
9	**Converted Indoor Firing Range – Bullet Trap**	*	**7,800**
10	Converted Indoor Firing Range – Stored Item – Locker	*	120
11	**Converted Indoor Firing Range – Floor**	*	**710**
12	**Outside Converted Indoor Firing Range – Drill Hall Floor**	*	**290**
13	Brett James Office – File Cabinet	*	<110
14	2nd Floor Classroom – Desk	*	<110
15	Blank	*	<12 (ug)

Key: **Bolded** results exceed listed criteria

Source: NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges

The National Guard Bureau currently utilizes 200 ug/ft^2 as a benchmark for identifying lead-contaminated surfaces. This guideline is referenced in NG PAM 420-15 "Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges" as a satisfactory surface contamination level unless the facility is utilized as a childcare facility. In such cases, U.S. Department of Housing and Urban Development (HUD) limit of 40 ug/ft^2 on floors and 250 ug/ft^2 on windowsills should be observed. There is no child care provided at this facility.

Lead surface and air samples were collected. The following is a summary of the findings and recommendations:

- Surface levels of lead were at or above the recommended guideline of 200 ug/ft^2 in the following locations:

    - Converted Indoor Firing Range – Bullet Trap
    - Converted Indoor Firing Range – Floor
    - Outside Converted Indoor Firing Range – Drill Hall Floor

    Cleaning procedures should be improved to maintain lead levels on surfaces below the recommended guideline of 200 ug/ft^2.

- Air samples for lead were below the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit of 50 ug/m^3.

- Paint was observed to be in good condition throughout the facility.

Section 4.0
Lighting

Section 4.0 Lighting

A lighting assessment was conducted throughout the facility. Measurements were collected using a Cooke Cal-Light 400L Precision Light Meter (Serial No. K070155). The light meter was last calibrated on September 10, 2011. Measurements collected were compared to ANSI/IESNA RP-7-01 Lighting Industrial Facilities and RP-1-04 Office Lighting.

Light Survey Assessment Summary

Location	Foot Candles (FC)	Recommended Lighting (FC)	Sufficient Lighting
Training Office	59.4	30-50	Yes
Non-Responsive Office	103.1	30-50	Yes
Conference Room	47.4	30-50	Yes
Commander's Office	62.8	30-50	Yes
Ladies Latrine	48.3	5	Yes
126th Administration Office	60.0	30-50	Yes
Drill Hall	81.2	10	Yes
Medic's Office	95.7	30-50	Yes
Kitchen	**32.6**	**50**	**No**
Gym (Exercise Room)	**8.3**	**30**	**No**
Motor Pool Office	**6.4**	**30-50**	**No**
Supply Room	**17.5**	**30**	**No**
126th Supply Room	31.6	30	Yes
MED DET Office	**20.2**	**30-50**	**No**
2nd Floor Locker Room	12.8	7	Yes
Empty Office	**18.8**	**30-50**	**No**
2nd Floor Classroom	**25.5**	**30-50**	**No**

Bolded results did not meet listed criteria

Source: ANSI/IESNA RP-7-01 Lighting Industrial Facilities and RP-1-04 Office Lighting.

The following is a summary of the findings and recommendations:

The lighting level measured did not meet the minimum recommended guideline in the following areas:

- Kitchen
- Gym (Exercise Room)
- Motor Pool Office
- Supply Room
- MED DET Office
- Empty Office
- 2nd Floor Classroom

Lighting should be improved in these areas.

Section 5.0
Indoor Air Quality

Section 5.0 Indoor Air Quality

Survey measurements were made for ventilation and comfort parameters (carbon dioxide, temperature, carbon monoxide and relative humidity). The air quality measurements were collected using direct reading instrumentation for comfort parameters using a QTRAK IAQ Meter, Model 7565 (Serial #7565X0839017). The IAQ Meter was last calibrated in February 11, 2011.

The American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) have developed indoor air quality guidelines for mechanically ventilated office buildings and commercial settings (ASHRAE standard 62.1-2010). ASHRAE specifies temperature and relative humidity ranges for human comfort (ASHRAE 55-2010). The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation, recommends maintaining a relative humidity range between 30 to 60% in occupied areas.

The following table summarizes the measurements collected.

IAQ Assessment Summary

Location	Temperature (◦F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)
Training Office	71.9	**68.5**	430	0.6
Non-Responsive Office	72.5	**66.6**	469	1.1
Conference Room	72.6	**65.2**	414	0.8
Commander's Office	72.9	**64.8**	424	1.0
126th Administration Office	72.7	**65.4**	430	0.6
Drill Hall	72.3	**64.6**	401	0.5
Medic's Office	72.7	**65.4**	412	0.5
Kitchen	73.0	**64.9**	440	0.1
Gym (Exercise Room)	72.2	**63.5**	376	0.7
Motor Pool Office	71.6	**65.1**	434	0.4
Supply Room	73.0	**64.1**	524	1.3
126th Supply Room	72.5	**63.2**	373	0.4
MED DET Office	72.4	**64.4**	399	0.8
2nd Floor Locker Room	71.5	**67.5**	487	0.2
Empty Office	72.3	**64.8**	411	0.7
2nd Floor Classroom	72.7	**63.6**	379	0.7
Outdoors	63.6	77.8	331	0.4
Criteria	**68.0-79.0**	**30-60**	**<1,031**	**<9.0**

Key: **Bolded** results exceed listed criteria

Source: The American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) 55-2010 & The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation.

Summary of findings and recommendations:

- Relative humidity was above the recommended criteria of 30-60% in all areas. Maintain relative humidity levels between 30-60%.

- Carbon dioxide levels did not exceed the recommended ceiling of 1,031 parts per million (ppm). This indicates that outdoor air ventilation is adequate in all areas.

- Carbon monoxide levels were less than the recommended ceiling of 9 ppm.

- A visual inspection was conducted throughout visually accessible portions of the facility. The visual inspection was conducted to assess sources or pathways of factors potentially deleterious to IAQ. It was reported that the roof was leaking but it is in the process of being replaced. Water stained ceiling tiles were observed throughout the facility. Visible fungal growth was observed on the flexible thermal foam pipe insulation in the 126th Supply Room (Approximately 50LF). Identify and repair the source of the water infiltration. Fungal growth should be properly remediated. Replace any water stained ceiling tiles.

- The HVAC supply and return vents located in some of the offices/classrooms were observed to be dirty some with possible fungal growth present. These should be cleaned. Do not permit dirt, debris, microbial growth, etc. to accumulate in any portion of the HVAC system.

Section 6.0

Suspect Asbestos Containing Building Materials

Section 6.0 Suspect Asbestos Containing Building Materials

Based on the age of the building (e.g., constructed in 1960) asbestos-containing materials (ACM) could be present in the facility. The following suspect asbestos-containing material was noted:

- Material on pipe insulation in the boiler room
- Pipe fittings (approximately 6) in the 2nd floor locker room
- 12" x 12" vinyl floor tile throughout the building.
- Vibration isolation cloths associated with HVAC system (Approximately 4).

These suspect materials were observed to be intact and in good condition. Inaccessible areas such as behind walls or inside crawlspaces were not inspected. No bulk samples were collected.

Section 7.0
Limitations

Section 7.0 Limitations

This report summarizes our evaluation of the conditions observed at the above referenced location. Our findings are based upon our observations and sampling results obtained at the facility at the time of our visit. The report, results, and subsequent recommendations reported herein are also limited to the information available at the time it was prepared and investigated. Conditions may have been in effect prior to the sampling events that have changed over time and which cannot be predicted within the scope of this limited investigation. Any conditions discovered which deviate from the data contained in this report should be presented to us for our evaluation.

This report is intended for the exclusive use of the client. This report and the findings herein shall not, in whole or in part, be relied upon by any other parties, disseminated or conveyed to any other party without prior written consent of the National Guard Bureau, and ALS Environmental. The findings are relative to the dates of our site visits and should not be relied upon for substantially later dates.

Appendix A
Laboratory Analysis Report

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY

LAP #100470

Client:	National Guard Bureau	**Job Name:**	RC-Col. SBI Duncan	**Chain Of Custody:**	511594
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	New Castle, DE	**Date Submitted:**	10/19/2011
	Havre de Grace, Maryland 21078	**Job Number:**	RC-Col. SBI Duncan	**Person Submitting:**	[redacted]
		P.O. Number:	NGB-HNE	**Date Analyzed:**	10/25/2011 **Report Date:** 10/26/2011

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
12006902	1110755-1	Flame	Air	530	N/A	5.7	ug/m³	<3	<5.7	ug/m³	
12006903	1110755-2	Flame	Air	529	N/A	5.7	ug/m³	<3	<5.7	ug/m³	
12006904	1110755-3	Flame	Air Blank	0	N/A	3	ug/m³		<3	ug	
12006905	1110755-4	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12006906	1110755-5	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12006907	1110755-6	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12006908	1110755-7	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12006909	1110755-8	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12006910	1110755-9	Flame	Wipe	****	0.108	110	ug/ft²	840	7800	ug/ft²	
12006911	1110755-10	Flame	Wipe	****	0.108	110	ug/ft²	13	120	ug/ft²	
12006912	1110755-11	Flame	Wipe	****	0.108	110	ug/ft²	76	710	ug/ft²	
12006913	1110755-12	Flame	Wipe	****	0.108	110	ug/ft²	31	290	ug/ft²	
12006914	1110755-13	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12006915	1110755-14	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12006916	1110755-15	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY
ISO/IEC 17025:2005
www.aihaaccreditation.org
Lab #100470

Client:	National Guard Bureau	**Job Name:**	RC-Col. SBI Duncan	**Chain Of Custody:**	511594
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	New Castle, DE	**Date Submitted:**	10/19/2011
	Havre de Grace, Maryland 21078	**Job Number:**	RC-Col. SBI Duncan	**Person Submitting:**	[redacted]
		P.O. Number:	NGB-IHNE	**Date Analyzed:**	10/25/2011 **Report Date:** 10/26/2011
Attention:	[redacted]				

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)

%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.

Analyst: [redacted] Non-Responsive

Technical Manager: [redacted] Non-Responsive

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquiries) **511594**

Pg 1 of 2

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 3071-JH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: RC-Col. SBI Duncan
2. Job Location: New Castle, DE
3. Job #: RC-Col. SBI Duncan P.O. #: W912K0-08-A0006 NGB-JHNE
4. Contact Person: [redacted] Non-Responsive
5. Submitted by: [redacted] Non-Responsive

Reporting Information (Results will be provided a

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Due Due: ____	☐ Immediate ☐ 3 Day	☒ [redacted] Non-Responsive @aol.com
☐ 24 Hours Time Due: ____	☐ Next Day ☒ 5 Day	☐ Fa[redacted] Non-Responsive @us.army.mil
Comments: ____	☐ 2 Day Date Due: 10/26/11	☐ Ve[redacted] Non-Responsive @us.army.mil
	☐ Results Required By Noon (Every Attempt Will Be Made to Accumulate)	

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
☐ MOSH 7400 ____ (QTY)
☐ Fiberglass ____ (QTY)
TEM Air – Please Indicate Filter Type:
☐ AHERA ____ (QTY)
☐ NIOSH 7402 ____ (QTY)
☐ Other (Specify ____) ____ (QTY)
TEM Bulk
☐ EPA 600 – Visual Estimate ____ (QTY)
☐ NPA Point Count ____ (QTY)
☐ NY State Friable 198.1 ____ (QTY)
☐ Gray Reduction/ ELAP 198.6 ____ (QTY)
☐ Other (Specify ____) ____ (QTY)
MISC
☐ Vermiculite
☐ Asbestos Soil PLM__(Qual PLM__(Quant PLM/TEM__(Qual PLM/TEM__(Quant

TEM Bulk
☐ ELAP 198.4/Chatfield ____ (QTY)
☐ NY State PLM/TEM ____ (QTY)
☐ Residual Ash ____ (QTY)
TEM Dust
☐ Qual. (prep/dis) Vacuum/Dust ____ (QTY)
☐ Quant. (Ghent) Vacuum D5755-95 ____ (QTY)
☐ Quant. (Astm) Dust D6480-99 ____ (QTY)
TEM Water
☐ Qual. (prep/dis) ____ (QTY)
☐ ELAP 198.2/EPA 100.2 ____ (QTY)
☐ EPA 100.1 ____ (QTY)

☒ All samples received in good condition unless otherwise noted.
TEM Water samples ____ °C)

Metals Analysis
☐ Pb Paint Chip ____ (QTY)
☒ Pb Dust Wipe (wipe type: ghost) 12 (QTY)
☒ Pb Air 3 (QTY)
☐ Pb Soil/Solid ____ (QTY)
☐ PbTCLP ____ (QTY)
☐ Drinking Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
☐ Waste Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
☐ Pb Furnace (Media ____) ____ (QTY)
Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples: ____
Collection Media: ____
☐ Spore-Trap ____ (QTY) ☐ Surface Vacuum Dust ____ (QTY)
☐ Surface Swab ____ (QTY) ☐ Culturable ID Genus Media ____ ____ (QTY)
☐ Surface Tape ____ (QTY) ☐ Culturable ID Specific Media ____ ____ (QTY)
☐ Other (Specify ____) ____ (QTY)

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: PCM	PCM	PLM	TEM	VOID	MATRIX: AIR	BULK	DUST	WIPE	SOIL	TAPE	SWAB
1110755-1		10/12	530					X		X						
1110755-2			529					X		X						
1110755-3			0					X		X						
1110755-4				100cm²				X				X				
1110755-5								X				X				
1110755-6								X				X				
1110755-7								X				X				
1110755-8								X				X				
1110755-9								X				X				
1110755-10								X				X				
1110755-11								X				X				
1110755-12								X				X				

CLIENT CONTACT
(LABORATORY STAFF ONLY)

Date/Time:	Contact:	By:
Date/Time:	Contact:	By:
Date/Time:	Contact:	By:

[redacted] Non-Responsive

LABORATORY STAFF ONLY (CUSTODY)
1. Date/Time RCVD: 10 / 19 / 11 @ 915 Via: UPS By (Print) [redacted] Non-Responsive
2. Date/Time Analyzed: ____ / ____ / ____ @ ____ By (Print) ____ Sign: ____
3. Results Reported To: ____ Via: ____ Date: ____ / ____ / ____ Time: ____ Initials: ____
4. Comments: IZ XI | 395 03 46087 7671

Page 2 of 2

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA #100470 NVLAP #101143-0 NY ELAP #10920
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 511594

pg 2 of 2

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-H Old Bay Lane
3. Address 2: Attn: NGB-AVN-BL State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: RC – Col. SP.I Duncan
2. Job Location:
3. Job #: P.O. #: W912K6-09-A-0003
4. Contact Person: [redacted] @ phone # (410) 942-0273
5. Submitted by: Signature:

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS		REPORT TO:
☐ Immediate Date Due: ☐ 24 Hour Time Due: Comments:	☐ Immediate ☐ Next Day ☐ 2 Day	☐ 3 Day ☒ 5 Day + Date Due:	☐ Results Required By Noon (Every Attempt Will Be Made to Accommodate)	☒ Include COC/Field Data Sheets with Report ☒ [redacted] @us.army.mil ☐ Fax: @us.army.mil ☐ Verb

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 ____(QTY)
☐ Fiberglass ____(QTY)
TEM Air – Please Indicate Filter Type:
☐ AHERA ____(QTY)
☐ NIOSH 7402 ____(QTY)
☐ Other (specify ____) ____(QTY)
PLM Bulk
☐ EPA 600 – Visual Estimate ____(QTY)
☐ EPA Point Count ____(QTY)
☐ NY State Friable 198.1 ____(QTY)
☐ Grav. Reduction ELAP 198.6 ____(QTY)
☐ Other (specify ____) ____(QTY)
MISC
☐ Vermiculite
☐ Asbestos Soil PLM __(Qual PLM __(Quant PLM/TEM __(Qual TEM/PCM __(Qua)

TEM Bulk
☐ ELAP 198.4/Chatfield ____(QTY)
☐ NY State PLM/TEM ____(QTY)
☐ Residual Ash ____(QTY)
TEM Dust
☐ Qual. (presence) Vacuum/Dust ____(QTY)
☐ Quan. (s/area) Vacuum D5755-95 ____(QTY)
☐ Quan. (s/area) Dust D6480-99 ____(QTY)
TEM Water
☐ Qual. (presence) ____(QTY)
☐ ELAP 198.2/EPA 100.2 ____(QTY)
☐ EPA 100.1 ____(QTY)

☐ All samples received in good condition unless otherwise noted. (TEM Water samples ____ °C)

Metals Analysis
☐ Pb Paint Chip ____(QTY)
☐ Pb Dust Wipe (wipe type ____) ____(QTY)
☐ Pb Air ____(QTY)
☐ Pb Soil/Solid ____(QTY)
☐ Pb TCLP ____(QTY)
☐ Drinking Water ☐ Pb ____(QTY) ☐ Cu ____(QTY) ☐ As ____(QTY)
☐ Waste Water ☐ Pb ____(QTY) ☐ Cu ____(QTY) ☐ As ____(QTY)
☐ Pb Furnace (Media ____) ____(QTY)
Fungal Analysis
Collection Apparatus for Spore Trap/Air Samples: ____
Collection Media ____
☐ Spore-Trap ____(QTY) ☐ Surface Vacuum Dust ____(QTY)
☐ Surface Swab ____(QTY) ☐ Culturable ID Genus (Media ____) ____(QTY)
☐ Surface Tape ____(QTY) ☐ Culturable ID Species (Media ____) ____(QTY)
☐ Other (Specify ____) ____(QTY)

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	ASB	BULK	DUST	WATER/ LIQUID	SOIL/ SOLID	TAPE	SWAB
1110755-13		6/1a		100cm²				X				X				
1110755-14		↓		↓				X				X				
1110755-15		↓		0cm²				X				X				

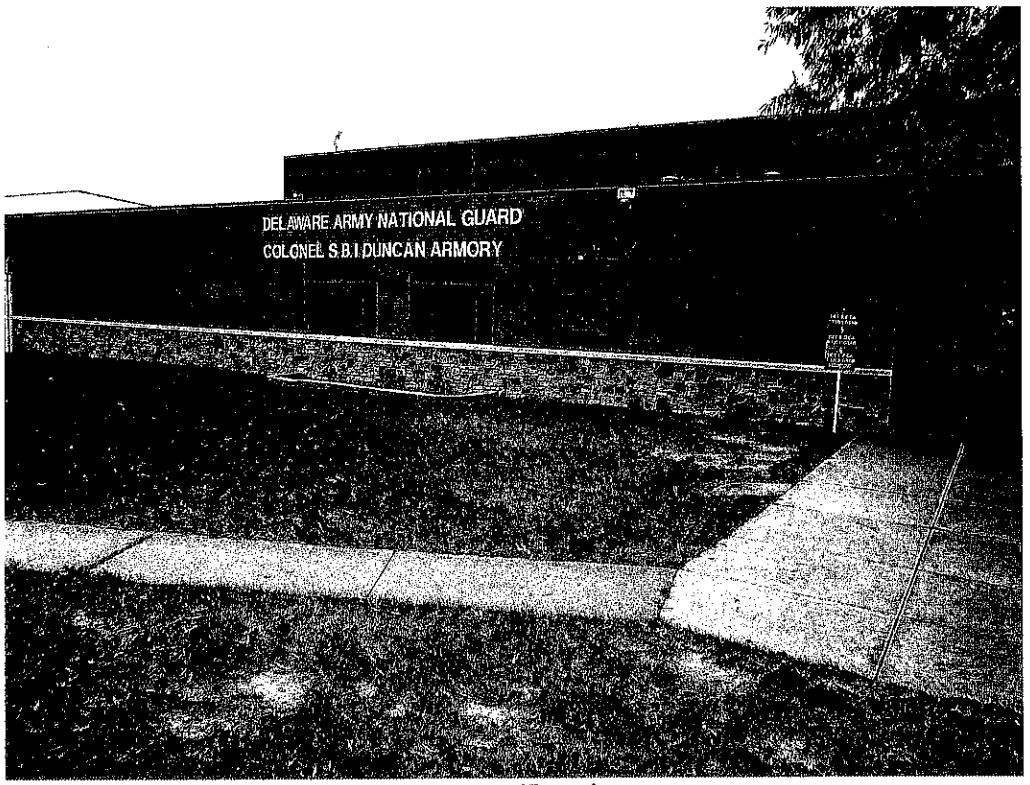
CLIENT CONTACT (LABORATORY STAFF ONLY)
Date/Time: Contact: By:
Date/Time: Contact: By:
Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: / / @ Via: By (Print): Sign: [redacted]
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments:

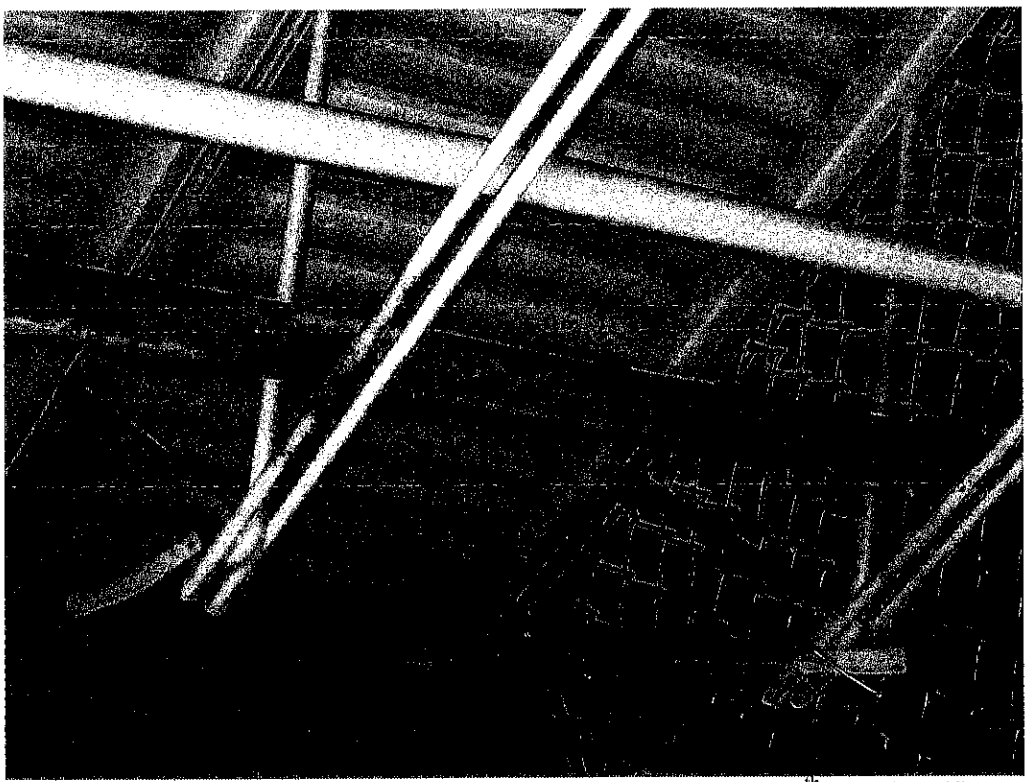
BEST AVAILABLE COPY

Appendix B. Photographs

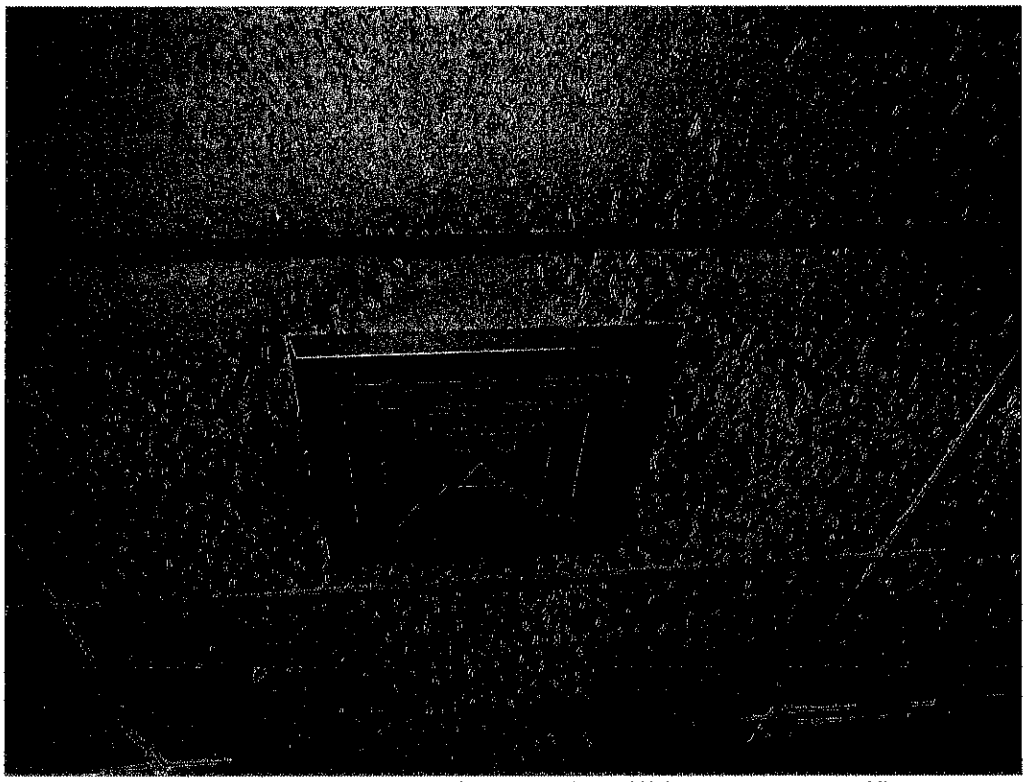
Appendix B
Photographs



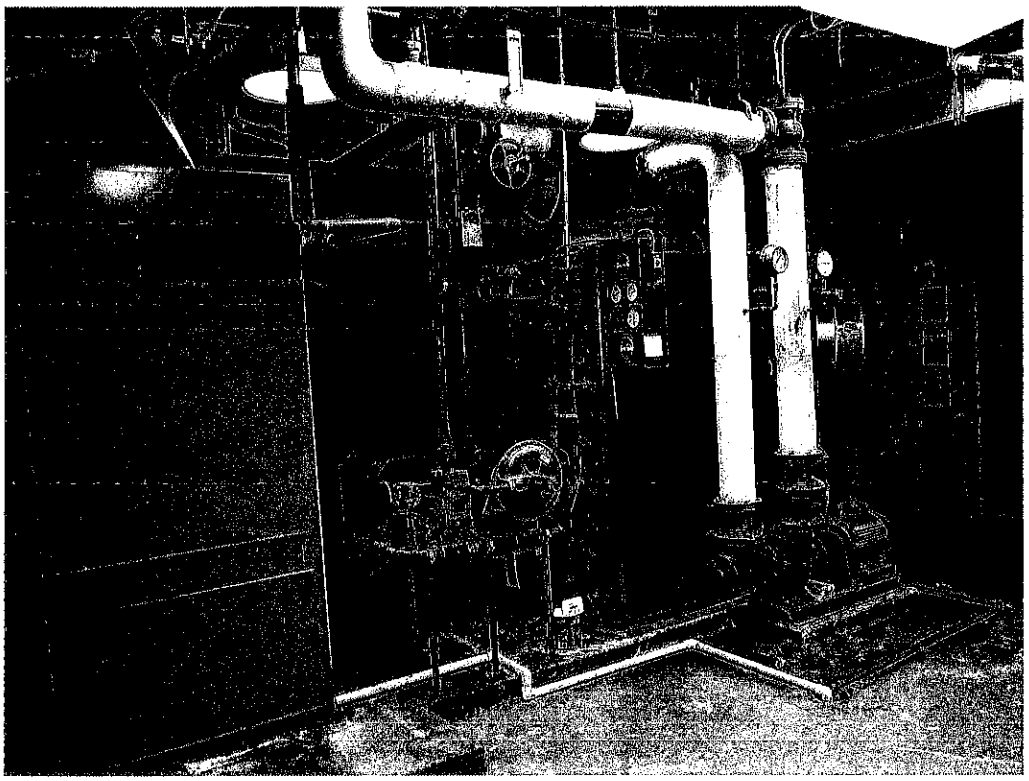
RC Col. SBI Duncan – Exterior



RC Col. SBI Duncan- Fungal growth on pipe insulation in 126th supply office

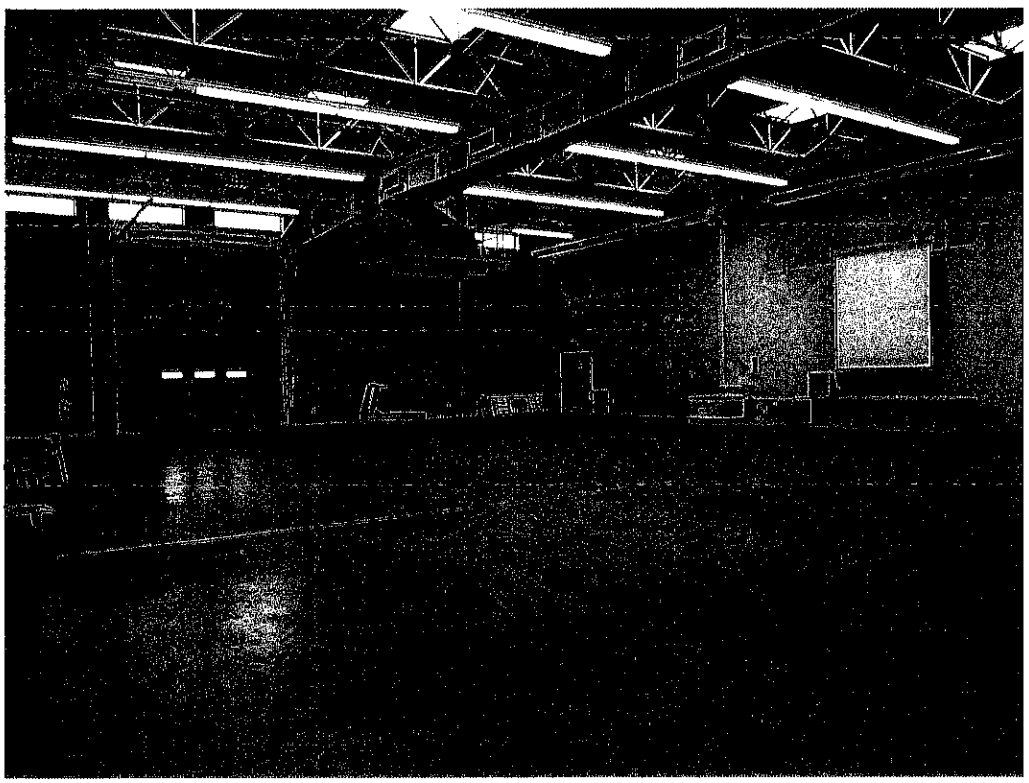


RC Col. SBI Duncan- Dirty supply grill in MED DET office

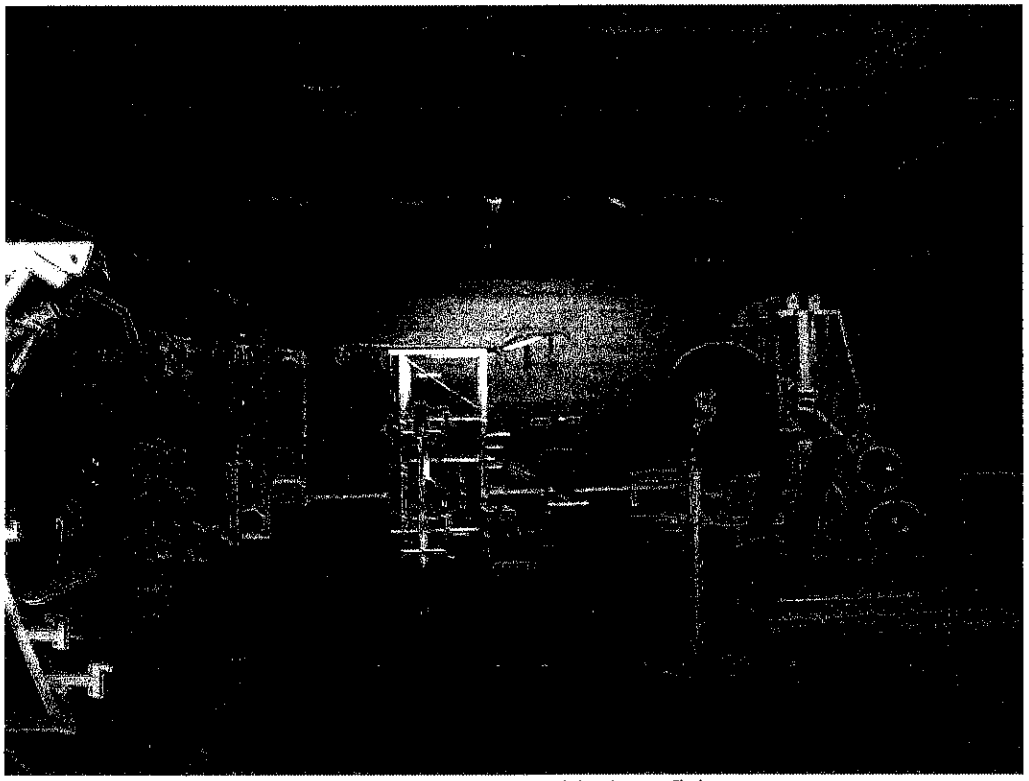


RC Col. SBI Duncan- Boiler

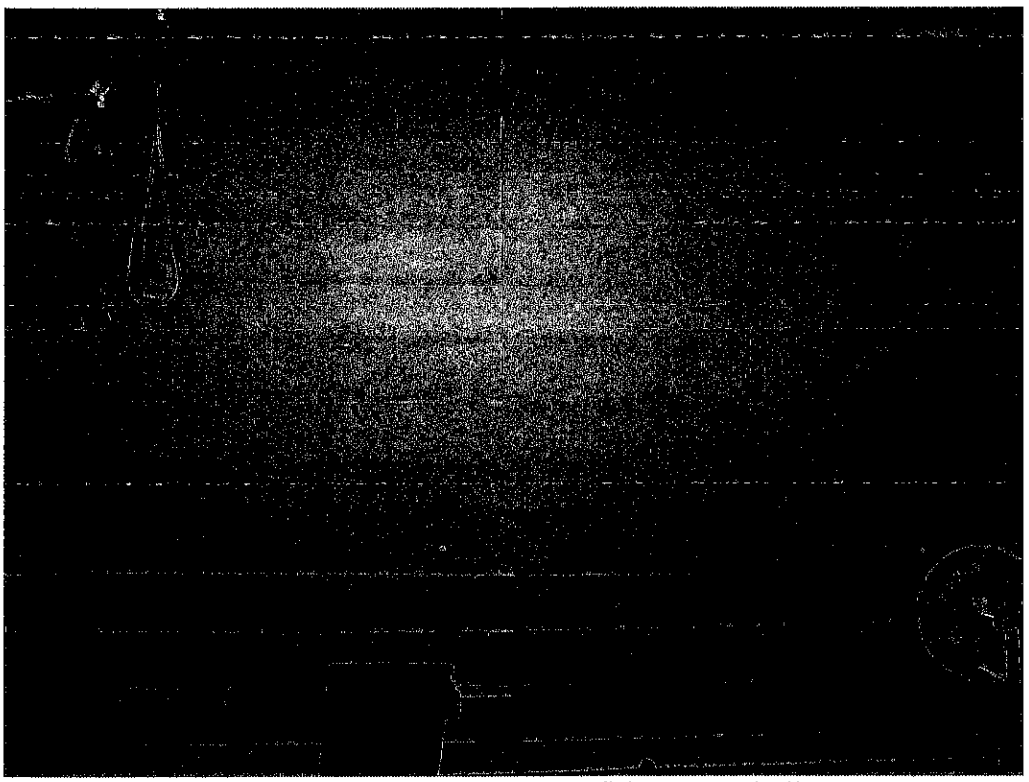
RC Col. SBI Duncan- Suspect asbestos containing joint material on boiler



RC Col. SBI Duncan- Drill Hall

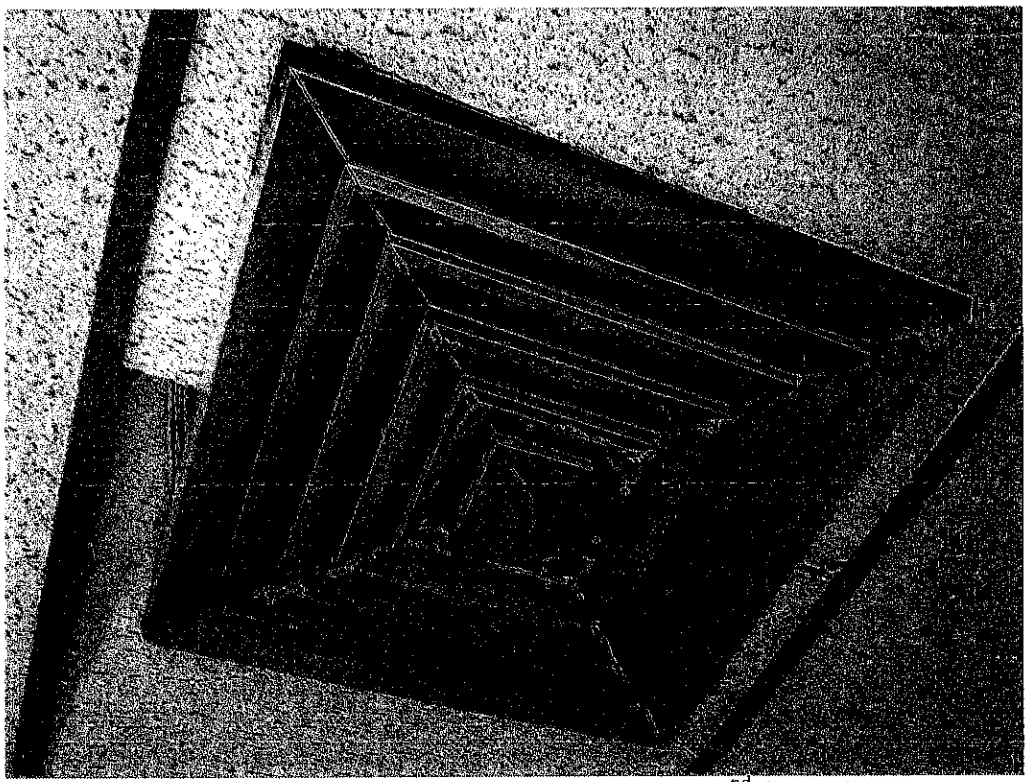


RC Col. SBI Duncan- Converted indoor firing range



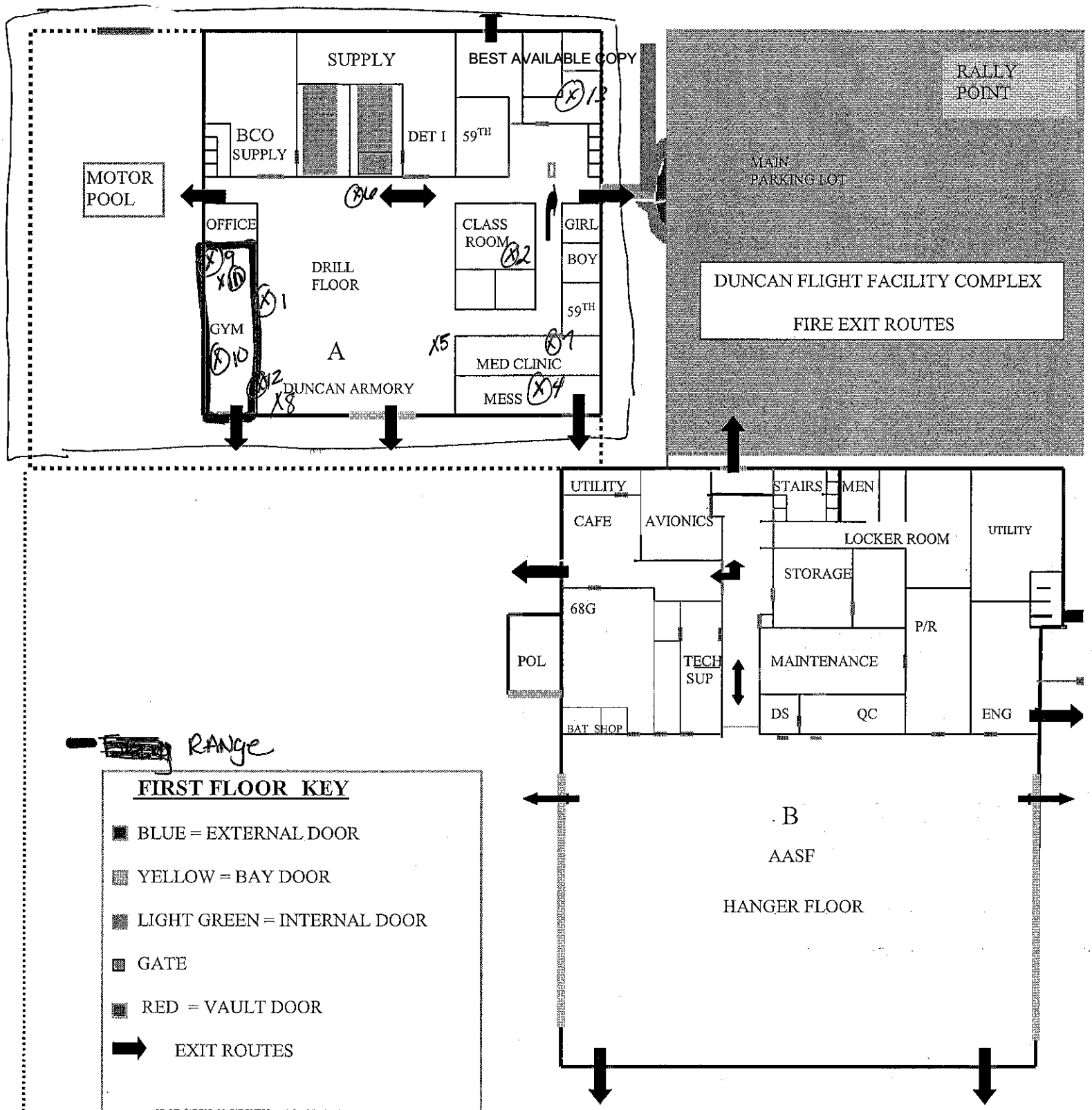
RC Col. SBI Duncan- Converted indoor firing range bullet trap

RC Col. SBI Duncan- Dirty return



RC Col. SBI Duncan- Fungal growth on supply grill in 2nd floor classroom

Appendix C
Floor Plan



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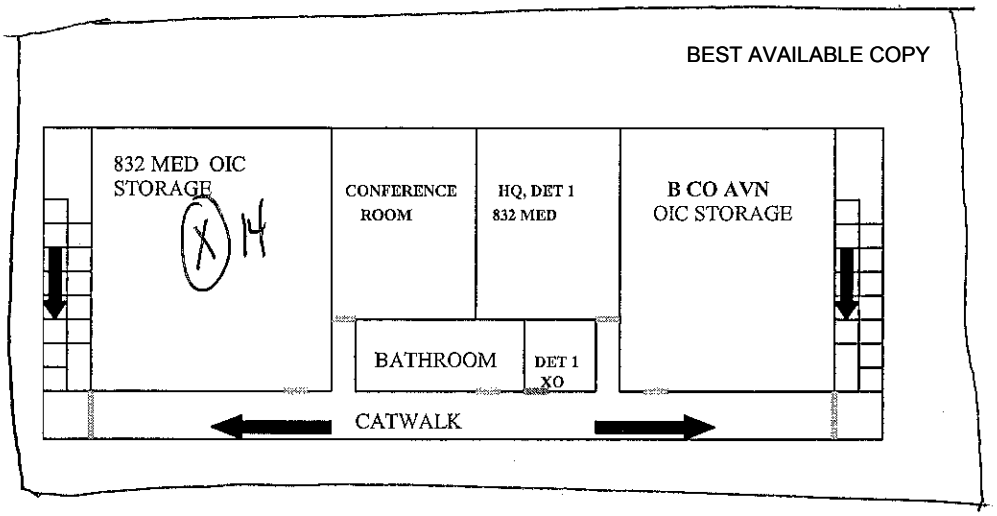
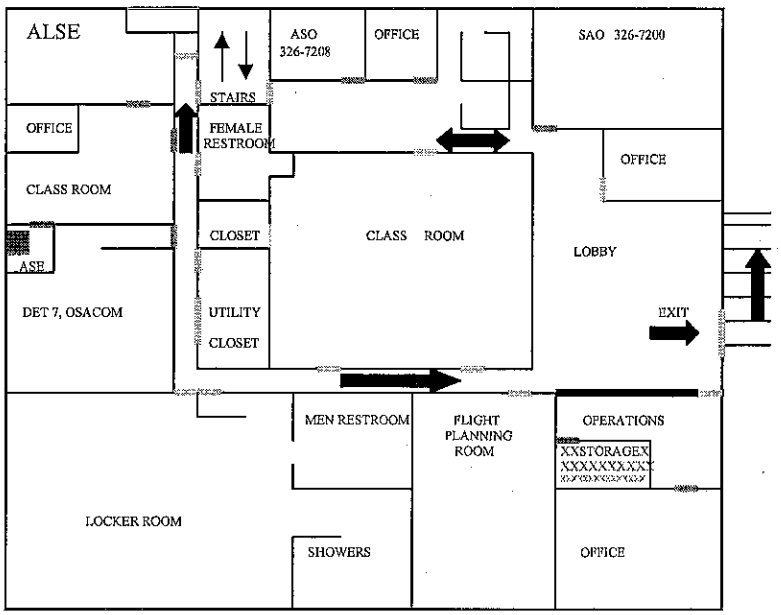


2ND FLOOR DUNCAN FLIGHT FACILITY COMPLEX

FIRE EXIT ROUTE

RESTRICTED AREA

EXIT ROUTE



Appendix D
References

Appendix D. References

1. Title 29 Code of Federal Regulations (CFR), Part 1910.1025, Occupational Safety and Health Administration, Occupational Exposure to Lead

2. American Conference of Governmental Industrial Hygienists (ACGIH) – Threshold Limit Values and Biological Exposure Indices, 2011 Edition

3. Industrial Ventilation: A Manual of Recommended Practice for Design, 27th Edition

4. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Ventilation for Acceptable Indoor Air Quality, 62.1-2010

5. RP-1-2004, Industrial Lighting, Illuminating Engineering Society of North America/ANSI

6. RP-7-2001, Industrial Lighting, Illuminating Engineering Society of North America/ANSI

7. National Emission Standard Hazardous Air Pollutants (NESHAP) – The standards for asbestos are contained in 40 CFR 61.140 through 61.157.

8. Environmental Protection Agency (EPA) standards [40 Code of Federal Regulations (CFR) 745.227(h)(3)]

9. Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM)

10. The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation

11. NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 NOV 06.

12. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Thermal Environmental Conditions for Human Occupancy, 55-2010.

COMPLIANCE MANAGEMENT INTERNATIONAL

1215 Manor Drive, Suite 205
Mechanicsburg, PA 17055
Phone: 717.590.7031
Fax: 717.590.7936
www.complianceplace.com

Industrial Hygiene Survey Report

National Guard Facility
Colonel S.B.I Duncan Readiness Center

Prepared For:	**National Guard Bureau Region North** **301-IH Old Bay Lane** **Havre de Grace, MD 21078**
Survey Location:	**Colonel S.B.I Duncan Readiness Center** **41 Corporate Circle** **New Castle, DE 19720**
Prepared By:	**Compliance Management International, Inc.** **1215 Manor Drive** **Suite 205** **Mechanicsburg, PA 17055**
Survey Date:	**November 14, 2012**
Report Date:	**January 22, 2013**

Non-Responsive

Senior Industrial Hygienist

Table of Contents

Section 1.0 Executive Summary

An industrial hygiene survey was conducted on November 14, 2012, at the Colonel S.B.I Duncan Readiness Center located at 41 Corporate Circle, New Castle, DE 19720. The survey was performed by Mr. Non-Responsive.

1. Lead surface and air samples were collected. Surface levels of lead exceeded the recommended guideline of 200 micrograms per square foot (ug/ft^2) in four locations. Cleaning procedures should be improved and remedial action should be taken to maintain lead levels below 200 ug/ft^2. See Section 3.0 for sampling results.

2. Lighting levels did not meet the American National Standard Institute/Illuminating Engineering Society of North America (ANSI/IESNA) recommended guideline in two areas. See Section 4.0 for detailed sampling results.

3. Indoor air quality (IAQ) parameters of temperature, relative humidity, carbon monoxide and carbon dioxide (ventilation) were evaluated during the assessment. Relative humidity levels were below The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation recommendations. See Section 5.0 for detailed sampling results

Section 2.0 Operation Description & Observations

The Colonel S.B.I Duncan Readiness Center is mainly an administrative facility with a drill hall, offices, classrooms and storage areas. There were approximately 5 full-time employees stationed at this facility at the time of this survey.

The building was initially constructed in 1960's. There have been some renovations since its construction. The building is two stories with a brick exterior. The interior walls are primarily concrete block. The floors are concrete with vinyl floor tile.

There is a central Heating, Ventilation, and Air-Conditioning (HVAC) system present in the facility. HVAC units service the building via a boiler fired heat pump. It was reported that the HVAC unit in the Drill Hall has not worked in decades.

The firing range has been converted into a weight room. The bullet trap and ballasts remain. The area appears very clean and well kept.

There is no child-care facility in the building.

Overall housekeeping practices were good. Areas were clean and well kept.

No ergonomic concerns were reported. Office areas have computer work stations. Work stations appeared properly designed. Personnel had supportive chairs.

Section 3.0 Lead Testing

Due to the age of the building there is the potential for lead based paint to be present. Various surfaces within the facility were screened for lead using surface/wipe samples. Surface/wipe samples were collected in accordance with the American Society for Testing and Materials (ASTM) E 1792 protocols. Air samples were collected using 0.8 um mixed cellulose ester (MCE) filter cassettes attached to low volume air sampling pumps. Blank samples were submitted to the laboratory for quality control purposes. Samples were sent to AMA Analytical Services, Inc., in Lanham, Maryland, for lead analysis using Environmental Protection Agency (EPA) Method 600/R-93/200 (M)-7420. A copy of the laboratory analysis report can be found in Appendix A.

Lead Testing Results Summary

Sample #	Location	Air ug/m^3	Surface ug/ft^2
1	Drill Hall	<8.1	*
2	Converted Firing Range	<8.2	*
3	Drill Hall – Center of Floor	*	<110
4	Drill Hall – Top of Flammable Cabinet	*	<110
5	Drill Hall – Top of Ice Machine	*	<110
6	Kitchen – Top of Refrigerator	*	<110
7	Kitchen – Ceiling Supply Diffuser	*	<110
8	**Converted Firing Range – Bullet Trap**	*	**12,000**
9	Converted Firing Range – Floor, 3 Feet from Bullet Trap	*	160
10	**Converted Firing Range – Top of Ductwork**	*	**220**
11	**Converted Firing Range – Top of Wall Locker**	*	**220**
12	Converted Firing Range – Top of Gym Equipment	*	140
13	Drill Hall – Floor by Converted Firing Range Entrance	*	<110
14	Medical Office – Top of Desk	*	<110
15	126th Readiness Office – Top of Desk	*	<110
16	Motor Pool Office – Top of TV	*	<110
17	**Locker Room – Top of Wall Locker**	*	**230**
18	Safety Office – Top of File Cabinet	*	<110
19	Blank – Wipe	<12	*
20	Blank – Air	*	<3

Table Notes:

1. **Bolded** results exceed listed criteria
2. **ppm =** parts per million
3. **ug/ft^2 =** micrograms per square foot
4. **ug/m^3** = micrograms per cubic meter
5. **ug =** micrograms

Source: NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges

The National Guard Bureau currently utilizes 200 ug/ft^2 as a benchmark for identifying lead-contaminated surfaces. This guideline is referenced in NG PAM 420-15 "Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges" as a satisfactory surface contamination level unless the facility is utilized as a childcare facility. In such cases, U.S. Department of Housing and Urban Development (HUD) limit of 40 ug/ft^2 on floors and 250 ug/ft^2 on windowsills should be observed. There is no child care provided at this facility.

Lead surface and air samples were collected. The following is a summary of the findings and recommendations:

- Surface levels of lead were above the recommended guideline of 200 ug/ft^2 in the following locations:

    - Converted Indoor Firing Range:
        - Bullet Trap
        - Top of Ductwork
        - Top of Wall Locker

    - Locker Room – Top of Wall Locker

    Cleaning procedures should be improved to maintain lead levels on surfaces below the recommended guideline of 200 ug/ft^2.

- Air samples for lead were below the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit of 50 ug/m^3.

- Paint was observed to be in good condition throughout the facility.

Section 4.0 Lighting

A lighting assessment was conducted throughout the facility. Measurements were collected using a Cooke Cal-Light 400L Precision Light Meter (Serial No. K6988364). The light meter was last calibrated in April 2012. Measurements collected were compared to ANSI/IESNA RP-7-01 Lighting Industrial Facilities and RP-1-04 Office Lighting.

Light Survey Assessment Summary

Location	Foot Candles (FC)	Recommended Lighting (FC)	Sufficient Lighting
126th Administration Office	61.3	30-50	Yes
Drill Hall	50.8	10	Yes
Medical Office	101	30-50	Yes
Kitchen	**42.8**	**50**	**No**
Weight Room	57	30	Yes
Motor Pool Office	**24.3**	**30-50**	**No**
Supply Room	60.1	30	Yes
Locker Room	15.3	7	Yes
Safety Office	52.1	30-50	Yes

Note: FC = Foot Candles

Source: ANSI/IESNA RP-7-01 Lighting Industrial Facilities and RP-1-04 Office Lighting.

The following is a summary of the findings and recommendations:

The lighting level measured did not meet the minimum recommended guideline in the Kitchen & Motor Pool Office. Lighting should be improved in these areas.

Section 5.0 Indoor Air Quality

Survey measurements were made for ventilation and comfort parameters (carbon dioxide, temperature, carbon monoxide and relative humidity). The air quality measurements were collected using direct reading instrumentation for comfort parameters using a QTRAK IAQ Meter, Model 7565 (Serial #02041015). The IAQ Meter was last calibrated in August 2012.

The American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) have developed indoor air quality guidelines for mechanically ventilated office buildings and commercial settings (ASHRAE standard 62.1-2010). ASHRAE specifies temperature and relative humidity ranges for human comfort (ASHRAE 55-2010). The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation, recommends maintaining a relative humidity range between 30 to 60%.

The following table summarizes the measurements collected.

IAQ Assessment Summary

Location	Temperature (◦F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)
Drill Hall	66.2	**23.8**	433	0.7
Converted Firing Range/Weight Room	64.9	**28.4**	426	0.3
Kitchen	64.2	**26.5**	419	0.1
Motor Pool Office	65.7	**27.2**	406	0
Medical Office	66.9	**28.3**	490	0
126th Readiness Office	67.8	**28.3**	504	0
Mechanical Room	66.6	**21.3**	1,022	0
Locker Room	67.5	**27.2**	453	0
Safety Office	68.9	**27.1**	531	0
Outdoors	57.6	70.8	377	0.4
Criteria	**68.0-79.0**	**30-60**	**<1,077**	**<9.0**

Table Notes:

1. **Bolded** results exceed listed criteria
2. **ppm =** parts per million
3. **(%) =** percent relative humidity
4. **F =** degrees Fahrenheit

Source: The American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) 55-2010, 62.1-2010 & The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation.

Summary of findings and recommendations:

- Relative humidity was below the recommended criteria of 30-60% in all areas. Low relative humidity can cause the drying of the mucous tissues and an increased susceptibility to respiratory infection. Maintain relative humidity levels between 30-60%.

- Carbon dioxide levels did not exceed the recommended ceiling of 1,077 parts per million (ppm). This indicates that outdoor air ventilation is adequate in all areas.

- Carbon monoxide levels were less than the recommended ceiling of 9 ppm.

- Temperature should be maintained at 68-79 degrees F for comfort in occupied areas. Many areas were not occupied at the time of this survey.

- A visual inspection was conducted throughout visually accessible portions of the facility. The visual inspection was conducted to assess sources or pathways of factors potentially deleterious to IAQ. It was reported that there is an odor present (e.g., “natural gas”) when the HVAC system first starts. This should be further investigated.

Section 6.0 Suspect Asbestos Containing Building Materials

Based on the age of the building (e.g., constructed in 1960) asbestos-containing materials (ACM) could be present in the facility. However, no suspect ACM was observed during this survey. Inaccessible areas such as behind walls or inside crawlspaces were not inspected.

Section 7.0 Equipment

The following equipment was utilized during this survey. All sampling equipment was properly calibrated prior to use and verified for accuracy as applicable. See daily reports and calibrations logs for detailed information.

Equipment	Serial #	Calibration Date	Value
TSI QTrak IAQ Meter	02041015	8/2012	NA
Cal Light 400 Light Meter	K98364	4/2012	NA
TSI 4199 Calibrator	41460827002	8/2012	NA
SKC Air Sampling Pump	647631	11/12/2012	2.44 LPM
SKC Air Sampling Pump	647610	11/12/2012	2.47 LPM

Section 8.0 Limitations

This report summarizes our evaluation of the conditions observed at the above referenced location. Our findings are based upon our observations and sampling results obtained at the facility at the time of our visit. The report, results, and subsequent recommendations reported herein are also limited to the information available at the time it was prepared and investigated. Conditions may have been in effect prior to the sampling events that have changed over time and which cannot be predicted within the scope of this limited investigation. Any conditions discovered which deviate from the data contained in this report should be presented to us for our evaluation.

This report is intended for the exclusive use of the client. This report and the findings herein shall not, in whole or in part, be relied upon by any other parties, disseminated or conveyed to any other party without prior written consent of the National Guard Bureau, and Compliance Management International, Inc. The findings are relative to the dates of our site visits and should not be relied upon for substantially later dates.

Appendix A. Laboratory Analysis Report

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	Delaware National Guard	**Chain Of Custody:**	514519
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	SBI Duncan RC	**Date Submitted:**	11/19/2012
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/27/2012 **Report Date:** 11/27/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Total ug	Final Result		Comments
13016041	1	Flame	Air	369	N/A	8.1	ug/m^3	<3	<8.1	ug/m^3	
13016042	2	Flame	Air	366	N/A	8.2	ug/m^3	<3	<8.2	ug/m^3	
13016043	3	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016044	4	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016045	5	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016046	6	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016047	7	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016048	8	Flame	Wipe	****	0.108	110	ug/ft^2	1300	12000	ug/ft^2	
13016049	9	Flame	Wipe	****	0.108	110	ug/ft^2	17	160	ug/ft^2	
13016050	10	Flame	Wipe	****	0.108	110	ug/ft^2	24	220	ug/ft^2	
13016051	11	Flame	Wipe	****	0.108	110	ug/ft^2	24	220	ug/ft^2	
13016052	12	Flame	Wipe	****	0.108	110	ug/ft^2	15	140	ug/ft^2	
13016053	13	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016054	14	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016055	15	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016056	16	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016057	17	Flame	Wipe	****	0.108	110	ug/ft^2	25	230	ug/ft^2	
13016058	18	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016059	19	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	

4475 Forbes Blvd. · Lanham, MD, 20706 · (301) 459-2640 · Toll Free (800) 346-0961 · Fax (301) 459-2643

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Delaware National Guard	**Chain Of Custody:**	514519
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	SBI Duncan RC	**Date Submitted:**	11/19/2012
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/27/2012 **Report Date:** 11/27/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Total ug	Final Result	Comments
13016060	20	Flame	Air Blank	0	N/A	3	ug/m³		<3 ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)

%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.

Analys Non-Responsive

Technical Manager: Non-Responsive

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AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 514519 (page 1 of 2)

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: Delaware National Guard
2. Job Location: SBI DUNCAN RC
3. Job #: P.O. #: W912K6-09-A-0003
4. Contact Person: [redacted]
5. Submitted by: [redacted]

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)
☐ Immediate Date Due:
☐ 24 Hours Time Due:
Comments:

NORMAL BUSINESS HOURS
☐ Immediate ☐ 3 Day
☐ Next Day ☒ 5 Day + Date Due: 11/28/12
☐ 2 Day
☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
☒ [redacted] with Report
☐ [redacted] @Complianceplace.com
☐ F [redacted] @us.army.mil
☐ V [redacted] @us.army.mil

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 (QTY)
☐ Fiberglass (QTY)
TEM Air – Please Indicate Filter Type:
☐ AHERA (QTY)
☐ NIOSH 7402 (QTY)
☐ Other (specify) (QTY)
PLM Bulk
☐ EPA 600 – Visual Estimate (QTY)
☐ EPA Point Count (QTY)
☐ NY State Friable 198.1 (QTY)
☐ Grav. Reduction ELAP 198.6 (QTY)
☐ Other (specify) (QTY)
MISC
☐ Vermiculite
☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
☐ ELAP 198.4/Chatfield (QTY)
☐ NY State PLM/TEM (QTY)
☐ Residual Ash (QTY)
TEM Dust
☐ Qual. (pres/abs) Vacuum/Dust (QTY)
☐ Quan. (s/area) Vacuum D5755-95 (QTY)
☐ Quan. (s/area)Dust D6480-99 (QTY)
TEM Water
☐ Qual. (pres/abs) (QTY)
☐ ELAP 198.2/EPA 100.2 (QTY)
☐ EPA 100.1 (QTY)

☒ All samples received in good condition unless otherwise noted. (TEM Water samples °C)

Metal Analysis
☐ Pb Paint Chip (QTY)
☒ Pb Dust Wipe (wipe type) (QTY)
☒ Pb Air (QTY)
☐ Pb Soil/Solid (QTY)
☐ Pb TCLP (QTY)
☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Pb Furnace (Media) (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
☐ Spore-Trap (QTY) ☐ Surface Vacuum Dust (QTY)
☐ Surface Swab (QTY) ☐ Culturable ID Genus (Media) (QTY)
☐ Surface Tape (QTY) ☐ Culturable ID Species (Media) (QTY)
☐ Other (Specify) (QTY)

	CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
1	Drill Hall		11-14	369					X								
2	Converted	Firing Range		366					X								
3	Drill Hall floor				100 cm²				X								
4	Drill Hall flammable Cabinet								X								
5	Drill Hall Top of Ice machine								X								
6	Kitchen - Top of Refridgerator								X								
7	Kitchen - supply Diffuser								X								
8	Converted Firing Range Bullet trap								X								
9	Converted Firing Range floor								X								
10	Converted Firing Range Top of Duct								X								
11	Converted Firing Range Top of locker								X								
12	Converted Firing Range Gym equipment								X								

CLIENT CONTACT
(LABORATORY STAFF ONLY)

Date/Time: Contact: By:
Blank sample 19 fell out of tube during shipping - when removed dirt while removing samples
Date/Time: Contact: By:
from bag. Sample 19 fell onto my shirt. [redacted]
Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: 11 / 19 / 12 @ 1000 Via: FedEx By (Print): [redacted] Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: By Date: / / Time:
4. Comments: 7934 3323 3287

[redacted]

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Focused on Results www.amalab.com
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CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 514519 (page 2 of 2)

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: Delaware National Guard
2. Job Location: JFTB Dunean Rd
3. Job #:
4. Contact Person: Non-Responsive
5. Submitted by:

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due:	☐ Immediate ☐ 3 Day	☑ Include COC/Field Data Sheets with Report
☐ 24 Hours Time Due:	☐ Next Day ☑ 5 Day +	☐ Email: Non-Responsive @Compliance place. com
Comments:	☐ 2 Day Date Due:	☐ Fax: @us.army.mil
	☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)	☐ Verb @us.army.mil

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
- ☐ NIOSH 7400 (QTY)
- ☐ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
- ☐ AHERA (QTY)
- ☐ NIOSH 7402 (QTY)
- ☐ Other (specify) (QTY)

PLM Bulk
- ☐ EPA 600 – Visual Estimate (QTY)
- ☐ EPA Point Count (QTY)
- ☐ NY State Friable 198.1 (QTY)
- ☐ Grav. Reduction ELAP 198.6 (QTY)
- ☐ Other (specify) (QTY)

MISC
- ☐ Vermiculite
- ☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
- ☐ ELAP 198.4/Chatfield (QTY)
- ☐ NY State PLM/TEM (QTY)
- ☐ Residual Ash (QTY)

TEM Dust
- ☐ Qual. (pres/abs) Vacuum/Dust (QTY)
- ☐ Quan. (s/area) Vacuum D5755-95 (QTY)
- ☐ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
- ☐ Qual. (pres/abs) (QTY)
- ☐ ELAP 198.2/EPA 100.2 (QTY)
- ☐ EPA 100.1 (QTY)

☐ All samples received in good condition unless otherwise noted. (TEM Water samples °C)

Metals Analysis
- ☐ Pb Paint Chip (QTY)
- ☑ Pb Dust Wipe (wipe type) (QTY)
- ☑ Pb Air (QTY)
- ☐ Pb Soil/Solid (QTY)
- ☐ Pb TCLP (QTY)
- ☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Pb Furnace (Media) (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
- ☐ Spore-Trap (QTY)
- ☐ Surface Swab (QTY)
- ☐ Surface Tape (QTY)
- ☐ Other (Specify) (QTY)
- ☐ Surface Vacuum Dust (QTY)
- ☐ Culturable ID Genus (Media) (QTY)
- ☐ Culturable ID Species (Media) (QTY)

SAMPLE INFORMATION: CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	MATRIX: AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
13	Drill Mat floor by Range	11-14		100 cm2				X								
14	medical office	Desk						X								
15	126 Readyness	office	Book Shelf					X								
16	motorpool office	TV.						X								
17	Locker Room	- Locker						X								
18	Safety office	- File cabinet						X								
19	Blank			0				X								
20	Blank	↓		0				X								

CLIENT CONTACT (LABORATORY STAFF ONLY)

Date/Time:	Contact:	By:
Date/Time:	Contact:	By:
Date/Time:	Contact:	By:

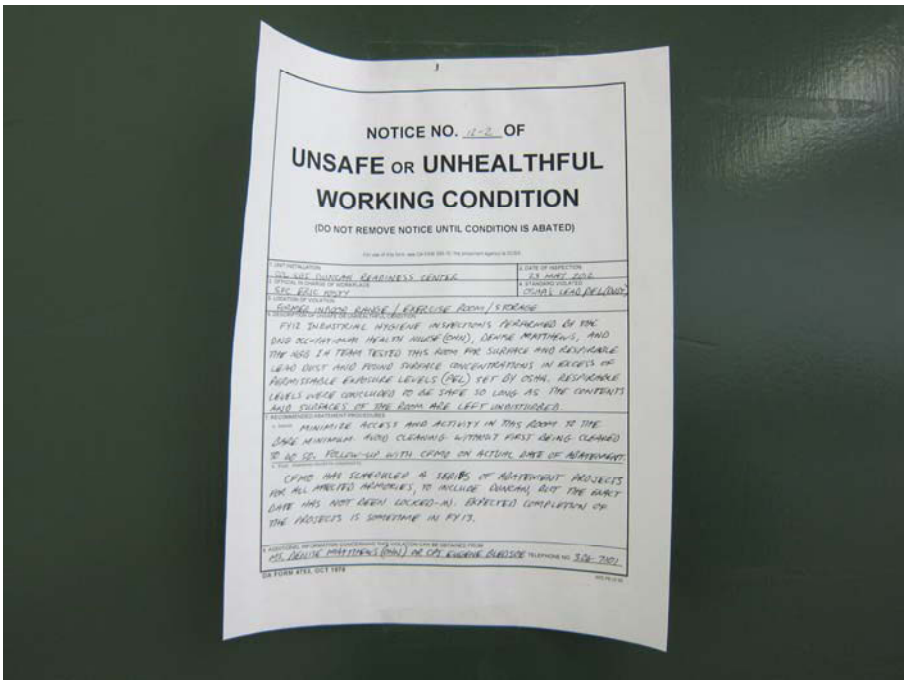
LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: / / @ Via: By (Print): Sign
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / /
4. Comments:

Non-Responsive

Appendix B. Photographs

Exterior of facility

Drill hall

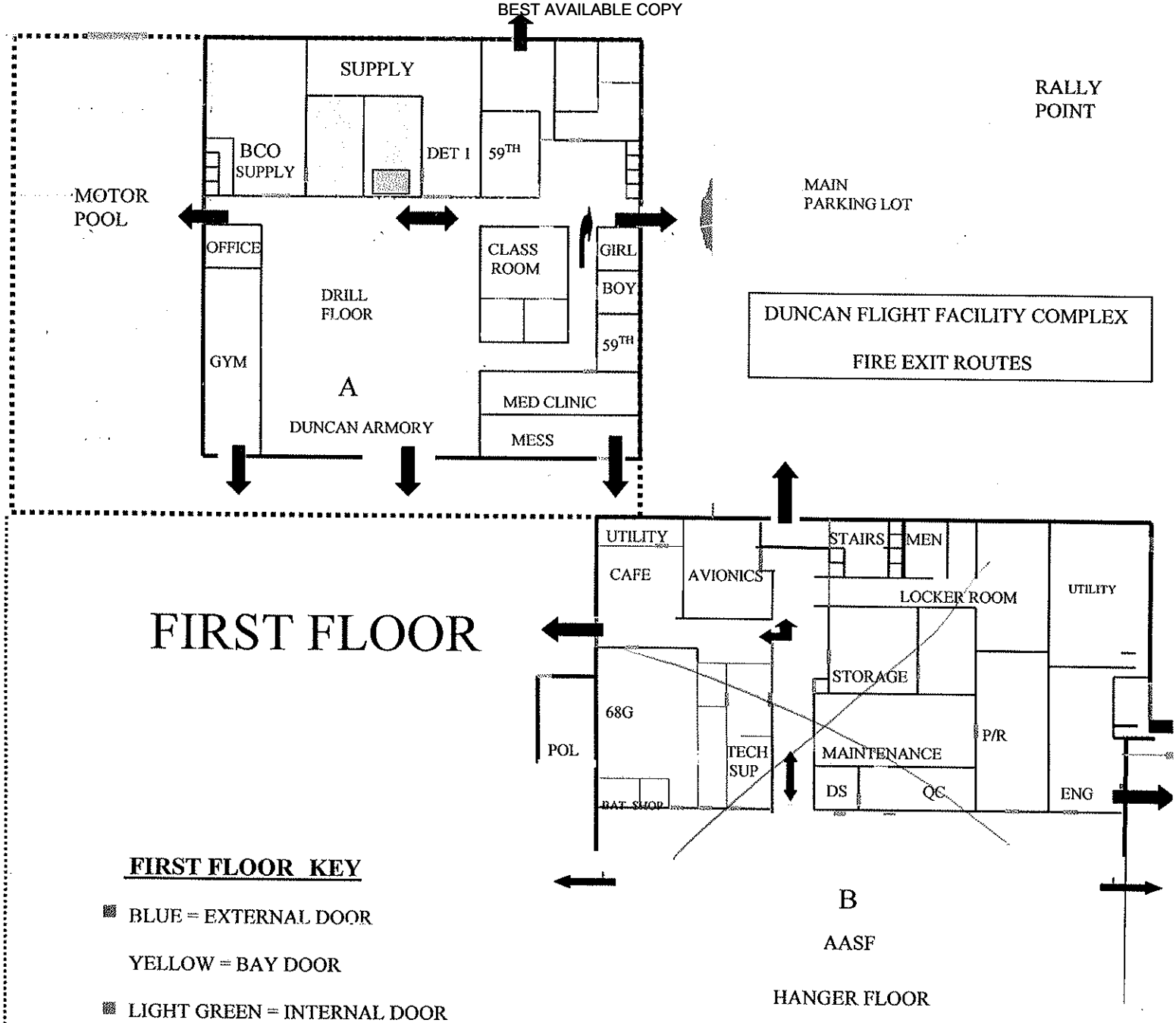


Lead warning sign on door to the converted firing range

Converted firing range

Top of wall locker in converted firing range

Appendix C. Floor Plan



FIRST FLOOR

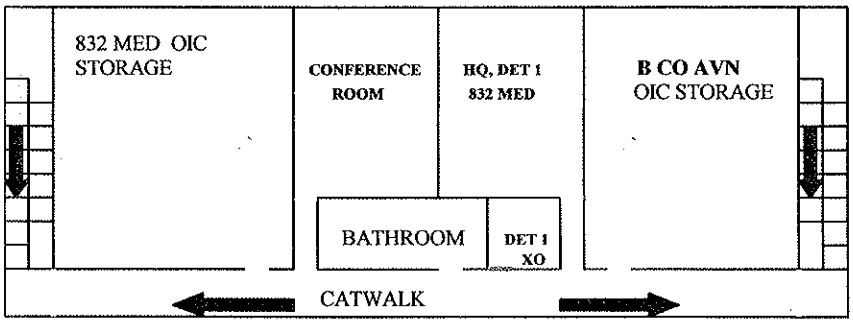
FIRST FLOOR KEY

- BLUE = EXTERNAL DOOR
- YELLOW = BAY DOOR
- LIGHT GREEN = INTERNAL DOOR
- GATE
- RED = VAULT DOOR
- EXJT ROUTES

RESTRICTED AREA !

- PURPLE = WEAPONS VAULT
- CLASSIFIED AREA

FLIGHT LINE

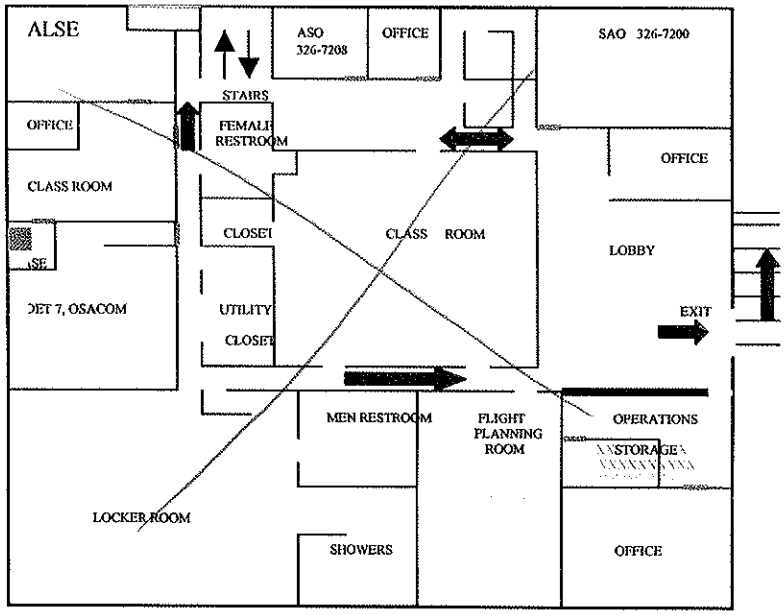


2ND FLOOR DUNCAN FLIGHT FACILITY COMPLEX

FIRE EXIT ROUTE

RESTRICTED AREA

EXIT ROUTE



Appendix D. References

1. Title 29 Code of Federal Regulations (CFR), Part 1910.1025, Occupational Safety and Health Administration, Occupational Exposure to Lead

2. American Conference of Governmental Industrial Hygienists (ACGIH) – Threshold Limit Values and Biological Exposure Indices, 2011 Edition

3. Industrial Ventilation: A Manual of Recommended Practice for Design, 27th Edition

4. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Ventilation for Acceptable Indoor Air Quality, 62.1-2010

5. RP-1-2004, Industrial Lighting, Illuminating Engineering Society of North America/ANSI

6. RP-7-2001, Industrial Lighting, Illuminating Engineering Society of North America/ANSI

7. National Emission Standard Hazardous Air Pollutants (NESHAP) – The standards for asbestos are contained in 40 CFR 61.140 through 61.157.

8. Environmental Protection Agency (EPA) standards [40 Code of Federal Regulations (CFR) 745.227(h)(3)]

9. Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM)

10. The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation

11. NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 NOV 06.

12. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Thermal Environmental Conditions for Human Occupancy, 55-2010.

COMPLIANCE MANAGEMENT INTERNATIONAL

1215 Manor Drive, Suite 205
Mechanicsburg, PA 17055
Phone: 717.590.7031
Fax: 717.590.7936
www.complianceplace.com

Industrial Hygiene Survey Report

National Guard Facility
John H. Pigman Readiness Center

Prepared For:	**National Guard Bureau Region North IH** **301-IH Old Bay Lane** **Havre de Grace, MD 21078**
Survey Location:	**John H. Pigman Readiness Center** **601 Bridgeville Road** **Seaford, DE 19973**
Prepared By:	**Compliance Management International, Inc.** **1215 Manor Drive** **Suite 205** **Mechanicsburg, PA 17055**
Survey Date:	**November 20, 2012**
Report Date:	**January 22, 2013**

Non-Responsive

Senior Industrial Hygienist

Table of Contents

Section 1.0 Executive Summary

An industrial hygiene survey was conducted on November 20, 2012, at the John H. Pigman Readiness Center located at 601 Bridgeville Road, Seaford, DE 19973. The survey was performed by Mr. Non-Responsive.

1. Lead bulk, surface and air samples were collected. Surface levels of lead exceeded 200 micrograms per square foot (ug/ft^2) in two locations associated with the converted indoor firing range. Cleaning procedures should be improved and remedial action should be taken to maintain lead levels below 200 ug/ft^2. See Section 3.0 for sampling results.

2. Lighting levels did not meet the American National Standard Institute/Illuminating Engineering Society of North America (ANSI/IESNA) recommended guideline in the Garage Area. See Section 4.0 for detailed findings.

3. Indoor air quality (IAQ) parameters of temperature, relative humidity, carbon monoxide and carbon dioxide (ventilation) were within recommended guidelines during this survey. See Section 4.0 for detailed findings.

4. Potential sources of indoor air quality concerns were observed or reported. These included:

    a. Water damaged ceilings;
    b. Clogged gutters/spouting.

Section 2.0 Operation Description & Observations

The John H. Pigman Readiness Center is mainly an administrative facility with a drill hall, offices, classrooms and storage areas. There were approximately 5 full-time employees stationed at this facility at the time of this survey.

The building was initially constructed in 1950 with additions in 1960. The building is one story with a brick exterior. The interior walls are primarily concrete block and drywall. The floors are concrete with vinyl floor tile or carpet.

There is a central Heating, Ventilation, and Air-Conditioning (HVAC) system present in the facility. HVAC units service the building via a boiler. Some offices have wall mounted or window mounted air conditioners. Supply and return grills were observed to be dirty.

The area of the building that was once a firing range has been converted into a locker room. No firing range components remain. The area appears very clean and well kept.

There is no child-care facility in the building.

Overall housekeeping practices were good. Areas were clean and well kept.

No ergonomic concerns were reported. Office areas have computer work stations. Work stations appeared properly designed. Personnel had supportive chairs.

Section 3.0 Lead Testing

Due to the age of the building there is the potential for lead based paint to be present. Various surfaces within the facility were screened for lead using surface/wipe samples. Surface/wipe samples were collected in accordance with the American Society for Testing and Materials (ASTM) E 1792 protocols. Air samples were collected using 0.8 um mixed cellulose ester (MCE) filter cassettes attached to low volume air sampling pumps. Blank samples were submitted to the laboratory for quality control purposes. Samples were sent to AMA Analytical Services, Inc., in Lanham, Maryland, for lead analysis using Environmental Protection Agency (EPA) Method 600/R-93/200 (M)-7420. A copy of the laboratory analysis report can be found in Appendix A.

Lead Testing Results Summary

Sample #	Location	Bulk (%)	Air ug/m^3	Surface ug/ft^2
1	Drill Hall	*	<6.7	*
2	Converted Firing Range – Locker Room	*	<6.7	*
3	Boiler Room – Peeling Paint	0.0094	*	*
4	Drill Hall – Center of Floor	*	*	<110
5	Drill Hall – HVAC Supply Diffuser	*	*	<110
6	Drill Hall – Top of Wall Locker	*	*	120
7	Kitchen – Stove Shelf	*	*	<110
8	Kitchen – Top of Metal Table	*	*	<110
9	**Hallway to Converted Firing Range**	*	*	**240**
10	**Converted Firing Range – Floor**	*	*	**1000**
11	Converted Firing Range – Top of Wall Locker	*	*	<110
12	Converted Firing Range – Top of Fan Motor	*	*	<110
13	Room 209 – Top of Desk	*	*	<110
14	Room 204 – Top of Desk	*	*	<110
15	Supply Office – Bookshelf	*	*	<110
16	Weight Room – Window	*	*	<110
17	Dining Hall – Top of Microwave	*	*	<110
18	Blank – Wipe	*	*	<12 ug
19	Blank – Air	*	<3 ug	*
-	Criteria	0.5	50	200

Table Notes:

1. **Bolded** results exceed listed criteria
2. **ppm =** parts per million
3. **ug/ft^2 =** micrograms per square foot
4. **ug/m^3** = micrograms per cubic meter
5. **ug =** micrograms

Source: NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges
The National Guard Bureau currently utilizes 200 ug/ft^2 as a benchmark for identifying lead-contaminated surfaces. This guideline is referenced in NG PAM 420-15 "Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges" as a satisfactory surface contamination level unless the facility is utilized as a childcare facility. In such cases, U.S. Department of Housing and Urban Development (HUD) limit of 40 ug/ft^2 on floors and 250 ug/ft^2 on windowsills should be observed. There is no child care provided at this facility.

Lead bulk, surface and air samples were collected. The following is a summary of the sample results from this survey.

- Surface levels of lead were at or above the recommended guideline of 200 ug/ft^2 in the following locations:

    - Converted Indoor Firing Range- Floor
    - Hallway into the Converted Indoor Firing Range

  Cleaning procedures should be improved to maintain lead levels on surfaces below the recommended guideline of 200 ug/ft^2.

- Air samples for lead were below the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit of 50 micrograms per cubic meter (ug/m^3).

- Paint was observed to be peeling in the boiler room. A bulk sample was collected and determined to contain 0.0094%Pb. This is less than the EPA definition of lead based paint = 0.5%. However, all areas of peeling paint should be repaired.

Section 4.0 Lighting

A lighting assessment was conducted throughout the facility. Measurements were collected using a Cooke Cal-Light 400L Precision Light Meter (Serial No. K98364). The light meter was last calibrated April 2012. Measurements collected were compared to ANSI/IESNA RP-7-01 Lighting Industrial Facilities and RP-1-04 Office Lighting.

Light Survey Assessment Summary

Location	Foot Candles (FC)	Recommended Lighting (FC)	Sufficient Lighting
Drill Hall	88.8	10	Yes
Room 215 (Office)	43.3	30-50	Yes
Rom 204 (Office)	52.7	30-50	Yes
Room 209 (Office)	57.4	30-50	Yes
Supply Office	55.8	30-50	Yes
Conference Room	84.1	30-50	Yes
Weight Room	37.4	30	Yes
Dining Hall	28.9	10	Yes
Garage - Storage	33.1	30	No

Table Notes:

1. FC = Foot Candles
2. **Bolded** results did not meet listed criteria

Source: ANSI/IESNA RP-7-01 Lighting Industrial Facilities and RP-1-04 Office Lighting.

The lighting level did not meet the minimum recommended guideline in the Garage Area. Lighting should be improved in this area.

Section 5.0 Indoor Air Quality

Survey measurements were made for ventilation and comfort parameters (carbon dioxide, temperature, carbon monoxide and relative humidity). The air quality measurements were collected using direct reading instrumentation for comfort parameters using a QTRAK IAQ Meter, Model 7565 (Serial #02041015). The IAQ Meter was last calibrated in August 2012.

The American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) have developed indoor air quality guidelines for mechanically ventilated office buildings and commercial settings (ASHRAE standard 62.1-2010). ASHRAE specifies temperature and relative humidity ranges for human comfort (ASHRAE 55-2010). The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation and Recommends maintaining a relative humidity range between 30 to 60%.

The following table summarizes the measurements collected.

IAQ Assessment Summary

Location	Temperature (◦F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)
Drill Hall	70.5	41.4	623	1.9
Room 215 (Office)	68.2	42.3	594	1.9
Room 204 (Office)	68.5	42.3	611	1.9
Room 209 (Office)	69.4	41.8	612	1.7
Supply Office	69.4	40.9	568	1.5
Conference Room	72	41.8	684	1.9
Weight Room	70.2	39.5	454	1.6
Dining Hall	69.4	36.1	414	1.6
Garage	67.5	36.8	402	1.3
Outdoors	56.3	40.2	373	2.5
Criteria	**68.0-79.0**	**30-60**	**<1,073**	**<9.0**

Table Notes:

1. **Bolded** results exceed listed criteria
2. **ppm =** parts per million
3. **(%) =** percent relative humidity
4. **F =** degrees Fahrenheit

Source: The American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) 55-2010, 62.1-2010 & The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation.

Summary of findings and recommendations:

- Temperature and relative humidity measurements were within the recommended guidelines.

- Carbon dioxide levels measured did not exceed the recommended ceiling of 1,073 parts per million (ppm). This indicates that outdoor air ventilation is adequate in sampled areas.

- Carbon monoxide levels measured were less than the recommended ceiling of 9 ppm.

- A visual inspection was conducted throughout visually accessible portions of the facility to assess sources or pathways of factors potentially deleterious to IAQ. The following observations were noted:

    - Painted areas in the boiler room was damaged due to water infiltration;
    - Efflorescence was noted on the exterior wall in the dining room and drill hall. This is believed to be due to clogged spouting and gutters.

  Identify and repair the source of the water infiltration. Inspect gutters and spouting and clean as needed. Replace any water stained ceiling tiles.

Section 6.0 Ventilation Survey

There is a two bay detached garage at this facility. It is used primarily for storage. There is no regular vehicle maintenance performed in this area. Minor maintenance tasks can be performed on an as needed basis. There is an eye wash station, first aid station, fire extinguisher and material safety data sheets in this area.

There are a total of four above floor exhausts located in the garage of the John H. Pigman Readiness Center. All measurements were conducted at the face of each exhaust using a Velocicalc Plus Model 9555-P. Measurements were compared to the American Conference of Governmental Industrial Hygienists (ACGIH) Industrial Ventilation Manual requirements for above floor exhaust systems. The table below details measurement findings.

ABOVE FLOOR EXHAUST VENTILATION RATE SUMMARY

Location	Type of Hood	Exhaust Diameter	Measured Flow Rate (CFM)
Exhaust 1	Above Floor	6" x 4"	38
Exhaust 2	Above Floor	3.5"	110
Exhaust 3	Above Floor	3.5"	292
Exhaust 4	Above Floor	6"x 4"	83

Notes: **CFM** = cubic feet per minute

Reference: Industrial Ventilation, A Manual of Recommended Practice for Design, 27th Edition, ACGIH.

EXAMPLES OF VEHICLE LEV SYSTEM REQUIREMENTS

Vehicle Nomenclature	Tailpipe Temp. (°F)	Engine Displacement (ft3)	Engine RPMs*	Exhaust Flow † (CFM)
M35A2, 2.5 Ton Cargo Truck	300	0.277	2,500	1,192
M1008 CUCV, SUV	267	0.219	3,800	1,370
M923A2, 5 Ton Cargo Truck	300	0.293	1,700	857
M996 HMMWV, All Terrain Vehicle	297	0.219	3,300	1,294

* Revolutions per Minute † Includes 20% Safety Factor

The actual flow rate that is required in an overhead vehicle exhaust system varies depending on the engine tail pipe temperature, whether or not the vehicle is "under load" or idling, engine displacement, engine size, etc. As an example, a 15 Liter Engine running at 1,000 rpm with an exhaust gas temperature of 1,300 F (heavy load) would require an exhaust flow of 2,110 CFM. If vehicle maintenance is performed at this facility we recommend the vehicle exhaust system be utilized. It should be regularly inspected to determine if it is operating as designed and meets the minimum requirements as recommended by the American Conference of Governmental Industrial Hygienists

(ACGIH) Industrial Ventilation: A Manual of Recommended Practice for Design (27th Edition).

Section 7.0 Suspect Asbestos Containing Building Materials

Based on the age of the building (e.g., constructed in 1950) asbestos-containing materials (ACM) could be present in the facility. However, no suspect ACM was noted at the time of this survey. Inaccessible areas such as behind walls or crawlspaces were not inspected.

Section 8.0 Equipment

The following equipment was utilized during this survey. All sampling equipment was properly calibrated prior to use and verified for accuracy as applicable. See daily reports and calibrations logs for detailed information.

Equipment	Serial #	Calibration Date	Value
TSI QTrak IAQ Meter	02041015	8/2012	NA
Cal Light 400 Light Meter	K98364	4/2012	NA
TSI 4199 Calibrator	41460827002	8/2012	NA
TSI Velometer	0733030	8/2012	NA
SKC Air Sampling Pump	647631	11/15/2012	2.49 LPM
SKC Air Sampling Pump	647610	11/15/2012	2.49 LPM

Section 9.0 Limitations

This report summarizes our evaluation of the conditions observed at the above referenced location. Our findings are based upon our observations and sampling results obtained at the facility at the time of our visit. The report, results, and subsequent recommendations reported herein are also limited to the information available at the time it was prepared and investigated. Conditions may have been in effect prior to the sampling events that have changed over time and which cannot be predicted within the scope of this limited investigation. Any conditions discovered which deviate from the data contained in this report should be presented to us for our evaluation.

This report is intended for the exclusive use of the client. This report and the findings herein shall not, in whole or in part, be relied upon by any other parties, disseminated or conveyed to any other party without prior written consent of the National Guard Bureau, and Compliance Management International, Inc. The findings are relative to the dates of our site visits and should not be relied upon for substantially later dates.

Appendix A. Laboratory Analysis Report

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Delaware National Guard	**Chain Of Custody:**	514552
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Pigman RC	**Date Submitted:**	11/26/2012
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/29/2012 **Report Date:** 11/29/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Total ug	Final Result		Comments
13016605	1	Flame	Air	448	N/A	6.7	ug/m^3	<3	<6.7	ug/m^3	
13016606	2	Flame	Air	448	N/A	6.7	ug/m^3	<3	<6.7	ug/m^3	
13016607	3	Flame	Paint Chip	****	N/A	0.0094	%Pb		<0.0094	%Pb	
13016608	4	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016609	5	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016610	6	Flame	Wipe	****	0.108	110	ug/ft^2	13	120	ug/ft^2	
13016611	7	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016612	8	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016613	9	Flame	Wipe	****	0.108	110	ug/ft^2	26	240	ug/ft^2	
13016614	10	Flame	Wipe	****	0.108	110	ug/ft^2	110	1000	ug/ft^2	
13016615	11	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016616	12	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016617	13	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016618	14	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016619	15	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016620	16	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016621	17	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016622	18	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	
13016623	19	Flame	Air Blank	0	N/A	3	ug/m^3		<3	ug	

AMA Analytical Services, Inc.

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ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Delaware National Guard	**Chain Of Custody:**	514552		
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Pigman RC	**Date Submitted:**	11/26/2012		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/29/2012	**Report Date:**	11/29/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)

%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.

Analy Non-Responsive

Technical Manage Non-Responsive

OWI (410) 247-2024

159202 210 REV. 6.08

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 514552

(page 1 of 2)

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: Delaware National Guard
2. Job Location: Pigman RC
3. Job #:
4. Contact Person: Non-Responsive
5. Submitted by: 942-0273

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)
☐ Immediate Date Due:
☐ 24 Hours Time Due:
Comments:

NORMAL BUSINESS HOURS
☐ Immediate ☐ 3 Day
☐ Next Day ☒ 5 Day + Date Due: 12/3/12
☐ 2 Day
☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

REPORT TO:
☒ Include COC/Field Data Sheets with Report
☒ Email: Non-Responsive @us.army.mil
☐ Fax:
☐ Verbal: @us.army.mil

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 (QTY)
☐ Fiberglass (QTY)
TEM Air – Please Indicate Filter Type:
☐ AHERA (QTY)
☐ NIOSH 7402 (QTY)
☐ Other (specify) (QTY)
PLM Bulk
☐ EPA 600 – Visual Estimate (QTY)
☐ EPA Point Count (QTY)
☐ NY State Friable 198.1 (QTY)
☐ Grav. Reduction ELAP 198.6 (QTY)
☐ Other (specify) (QTY)
MISC
☐ Vermiculite
☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
☐ ELAP 198.4/Chatfield (QTY)
☐ NY State PLM/TEM (QTY)
☐ Residual Ash (QTY)
TEM Dust
☐ Qual. (pres/abs) Vacuum/Dust (QTY)
☐ Quan. (s/area) Vacuum D5755-95 (QTY)
☐ Quan. (s/area)Dust D6480-99 (QTY)
TEM Water
☐ Qual. (pres/abs) (QTY)
☐ ELAP 198.2/EPA 100.2 (QTY)
☐ EPA 100.1 (QTY)

☒ All samples received in good condition unless otherwise noted.
(TEM Water samples °C)

Metals Analysis
☐ Pb Paint Chip 1 (QTY)
☐ Pb Dust Wipe (wipe type Ghost) 15 (QTY)
☐ Pb Air 3 (QTY)
☐ Pb Soil/Solid (QTY)
☐ Pb TCLP (QTY)
☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Pb Furnace (Media) (QTY)

Mycological Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
☐ Spore-Trap (QTY) ☐ Surface Vacuum Dust (QTY)
☐ Surface Swab (QTY) ☐ Culturable ID Genus (Media) (QTY)
☐ Surface Tape (QTY) ☐ Culturable ID Species (Media) (QTY)
☐ Other (Specify) (QTY)

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	MATRIX: WATER AND OTHER	SPORE TRAP	TAPE	SWAB
1 Drill Hall		11-20	448					X								
2 Converted Firing Range			448					X								
3 Boiler Rm Paint Chip				1 foot²				X			X					
4 Drill Hall	floor			100 cm²				X								
5 Drill Hall	supply Diffuser							X								
6 Drill Hall Locker								X								
7 Kitchen - Stove shelf								X								
8 Kitchen - Table								X								
9 Hallway to Range -								X								
10 Converted Range floor								X								
11 Converted Range - Locker								X								
12 Converted Range Fan motor		↓		↓				X								

CLIENT CONTACT
(LABORATORY STAFF ONLY)
Date/Time: Contact: By:
Date/Time: Contact: By:
Date/Time: Contact: By:

Non-Responsive

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: 11/26/12 @0830 Via: FEDEX By (Print):
2. Date/Time Analyzed: / / @ By (Print):
3. Results Reported To: Via: Date: / / Time:
4. Comments: 7935 3323 2470

OWI (410) 247-2024 159202 210 REV. 6.08

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
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4475 Forbes Blvd. • Lanham, MD 20706
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CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 514552 (page 2 of 2)

Mailing/Billing Information:

1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:

1. Job Name: Delaware Nation Guard
2. Job Location: Agman
3. Job #: P.O. #: W912K6-09-A-0003
4. Contact Person: Non-Responsive) 942-0273
5. Submitted By:

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)
❑ Immediate Date Due:
❑ 24 Hours Time Due:
Comments:

NORMAL BUSINESS HOURS
❑ Immediate ❑ 3 Day
❑ Next Day ❑ 5 Day +
❑ 2 Day Date Due:
❑ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
☑ Include COC/Field Data Sheets with Report
☑ Email: Non-Responsive us.army.mil
❑ Fax: us.army.mil
❑ Verb

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
❑ NIOSH 7400 (QTY)
❑ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
❑ AHERA (QTY)
❑ NIOSH 7402 (QTY)
❑ Other (specify) (QTY)

PLM Bulk
❑ EPA 600 – Visual Estimate (QTY)
❑ EPA Point Count (QTY)
❑ NY State Friable 198.1 (QTY)
❑ Grav. Reduction ELAP 198.6 (QTY)
❑ Other (specify) (QTY)

MISC
❑ Vermiculite
❑ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
❑ ELAP 198.4/Chatfield (QTY)
❑ NY State PLM/TEM (QTY)
❑ Residual Ash (QTY)

TEM Dust
❑ Qual. (pres/abs) Vacuum/Dust (QTY)
❑ Quan. (s/area) Vacuum D5755-95 (QTY)
❑ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
❑ Qual. (pres/abs) (QTY)
❑ ELAP 198.2/EPA 100.2 (QTY)
❑ EPA 100.1 (QTY)

❑ All samples received in good condition unless otherwise noted. (TEM Water samples ℃)

Metals Analysis
❑ Pb Paint Chip (QTY)
❑ Pb Dust Wipe (wipe type) (QTY)
❑ Pb Air (QTY)
❑ Pb Soil/Solid (QTY)
❑ Pb TCLP (QTY)
❑ Drinking Water ❑ Pb (QTY) ❑ Cu (QTY) ❑ As (QTY)
❑ Waste Water ❑ Pb (QTY) ❑ Cu (QTY) ❑ As (QTY)
❑ Pb Furnace (Media) (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
❑ Spore-Trap (QTY) ❑ Surface Vacuum Dust (QTY)
❑ Surface Swab (QTY) ❑ Culturable ID Genus (Media) (QTY)
❑ Surface Tape (QTY) ❑ Culturable ID Species (Media) (QTY)
❑ Other (Specify) (QTY)

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	MATRIX: DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
13	Room 209 - Desk	11-20		100 cm²				X								
14	Room 204 Desk							X								
15	Supply office - Book shelf							X								
16	Weight Room - window sill							X								
17	Dining Hall - microwave							X								
18	Blank							X								
19	Blank	↓	0	↓				X								

CLIENT CONTACT (LABORATORY STAFF ONLY)

Date/Time: Contact: By:

Date/Time: Contact: By:

Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: / / @ Via: By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time:
4. Comments:

Appendix B. Photographs

Exterior of facility

Exterior two bay detached garage

Drill hall efflorescence below window

Drill hall dirty supply diffuser

Door to converted firing range lead warning sign

Converted firing range

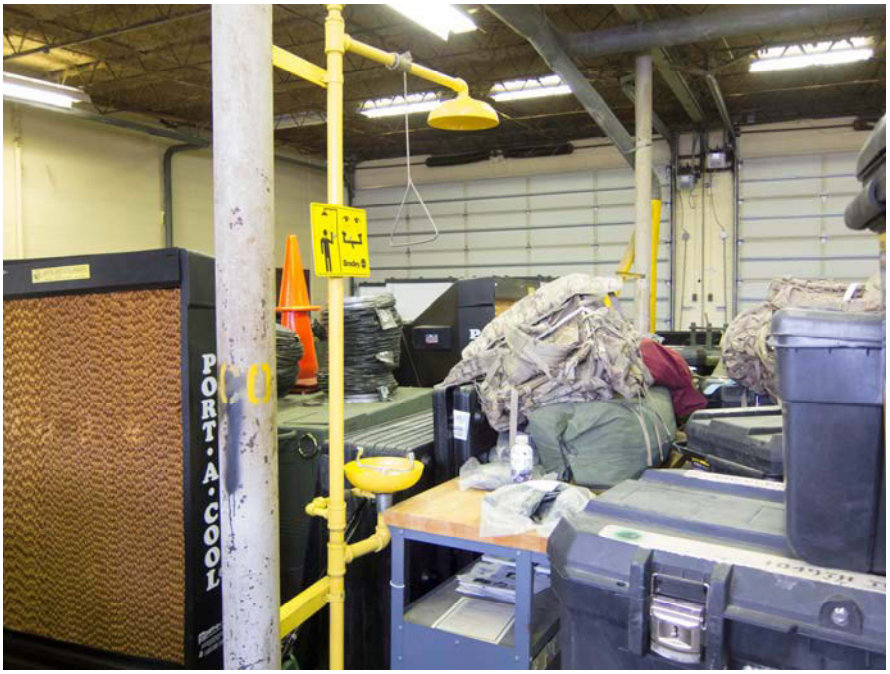
Dining hall efflorescence on exterior concrete block wall

Drill Hall

Boiler room peeling paint and water damage ceiling

Inside the two bay detached garage

Inside the two bay detached garage MSDS station



Inside the two bay detached garage eye wash station

Inside the two bay detached garage fist aid station

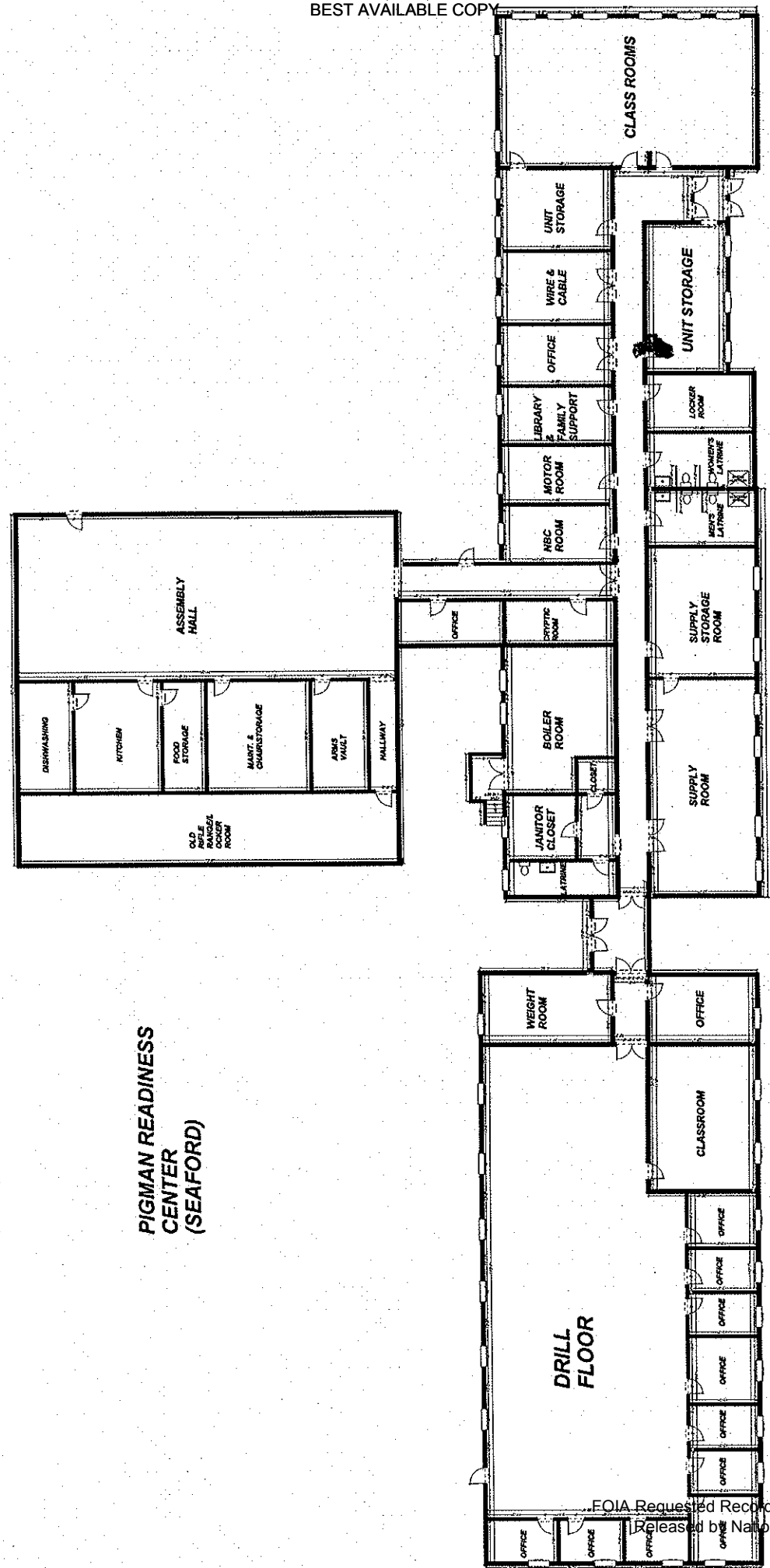
Inside the two bay detached garage overhead vehicle exhaust blower motor

Inside the two bay detached garage overhead vehicle exhaust duct

Inside the two bay detached garage overhead vehicle exhaust duct

Inside the two bay detached garage fire extinguisher

Appendix C. Floor Plan



PIGMAN READINESS CENTER (SEAFORD)

Appendix D. References

1. Title 29 Code of Federal Regulations (CFR), Part 1910.1025, Occupational Safety and Health Administration, Occupational Exposure to Lead

2. American Conference of Governmental Industrial Hygienists (ACGIH) – Threshold Limit Values and Biological Exposure Indices, 2011 Edition

3. Industrial Ventilation: A Manual of Recommended Practice for Design, 27th Edition

4. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Ventilation for Acceptable Indoor Air Quality, 62.1-2010

5. RP-1-2004, Industrial Lighting, Illuminating Engineering Society of North America/ANSI

6. RP-7-2001, Industrial Lighting, Illuminating Engineering Society of North America/ANSI

7. National Emission Standard Hazardous Air Pollutants (NESHAP) – The standards for asbestos are contained in 40 CFR 61.140 through 61.157.

8. Environmental Protection Agency (EPA) standards [40 Code of Federal Regulations (CFR) 745.227(h)(3)]

9. Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM)

10. The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation, Feb 2002.

11. NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 NOV 06.

12. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Thermal Environmental Conditions for Human Occupancy, 55-2010.

Industrial Hygiene Survey Report

National Guard Facility
Scannell Readiness Center

Prepared For:	**National Guard Bureau Region North IH** **301-IH Old Bay Lane** **Havre de Grace, MD 21078**
Survey Location:	**Scannell Readiness Center** **Governor Bacon Health Center** **Delaware City, DE 19706**
Prepared By:	**ALS Environmental** **3544 North Progress Avenue** **Suite 100** **Harrisburg, PA 17110**
Survey Date:	**October 7, 2011**
Report Date:	**November 10, 2011**
ALS Project #:	**1110728**

Non-Responsive

Director, Industrial Hygiene Services

Table of Contents

Section 1.0
Executive Summary

Section 1.0 Executive Summary

An industrial hygiene survey was conducted on October 7, 2011, at the Scannell Readiness Center located at Governor Bacon Health Center, Delaware City, DE 19706. The survey was performed by Ms. Non-Responsive.

1. Lead surface and air samples were collected. Surface levels of lead exceeded 200 micrograms per square foot (ug/ft2) in five locations associated with the converted indoor firing range. Cleaning procedures should be improved and remedial action should taken to maintain lead levels below 200 (ug/ft2). See Section 3.0 for sampling results.

2. Lighting levels did not meet the American National Standard Institute/Illuminating Engineering Society of North America (ANSI/IESNA) recommended guideline in the supply office, supply storage room and the 153rd classroom. Improve lighting in these areas.

3. Indoor air quality (IAQ) parameters of temperature, relative humidity, carbon monoxide and carbon dioxide (ventilation) were evaluated during the assessment. All parameters were within recommended guidelines.

4. Some water damaged ceiling tiles were observed throughout the facility. Identify and repair all sources of water infiltration. Remove and replace all water stained ceiling tiles.

5. The heating, ventilating, and air conditioning system (HVAC) supply and return grills located in some of the offices and classrooms were observed to be dirty. These should be cleaned. Do not permit dirt, debris, microbial growth, etc. to accumulate in any portion of the HVAC system.

Section 2.0
Operation Description & Observation

Section 2.0 Operation Description & Observations

The Scannell Readiness Center is mainly an administrative facility with a drill hall, offices, classrooms and storage areas. There were approximately 5 full-time employees stationed at this facility at the time of this survey.

The building was initially constructed in 1976. The building is two stories with a brick exterior. The interior walls are primarily concrete block. The floors are concrete with vinyl floor tile or carpet.

There is a central HVAC system present in the facility. Two HVAC units service the building via a boiler.

The firing range has been converted into a locker/storage area. However, the bullet trap and overhead components remain. The area appeared to be clean and well kept.

There is no child-care facility in the building.

Overall housekeeping practices were fair and could be improved.

No ergonomic concerns were reported. Office areas have computer work stations. Work stations appeared properly designed. Personnel had supportive chairs.

During the lighting survey some of the lighting fixtures were being replaced in the 153rd orderly room.

Section 3.0
Lead Testing

Section 3.0 Lead Testing

Due to the age of the building there is the potential for lead based paint to be present. Various surfaces within the facility were screened for lead using surface/wipe samples. Surface/wipe samples were collected in accordance with the American Society for Testing and Materials (ASTM) E 1792 protocols. Air samples were collected using 0.8 um mixed cellulose ester (MCE) filter cassettes attached to low volume air sampling pumps. Blank samples were submitted to the laboratory for quality control purposes. Samples were sent to AMA Analytical Services, Inc., in Lanham, Maryland, for lead analysis using Environmental Protection Agency (EPA) Method 600/R-93/200 (M)-7420. A copy of the laboratory analysis report can be found in Appendix A.

Lead Testing Results Summary

Sample #	Location	Air ug/m^3	Surface ug/ft^2
1	Drill Hall	<5.7	*
2	153rd Orderly Room	<5.7	*
3	Blank	<3 (ug)	*
4	Drill Hall – Floor Near Overhead Door	*	160
5	Drill Hall – Kitchen Top of Refrigerator	*	<110
6	Drill Hall – Top of Locker	*	190
7	Drill Hall – Floor By Lobby	*	<110
8	Drill Hall – Top of Display Case	*	<110
9	Shop Operations Office – Shelf	*	<110
10	153rd Orderly Room – Supply Grill	*	<110
11	**Converted Indoor Firing Range – Bullet Trap**	*	**660**
12	Converted Indoor Firing Range – Stored Item- Refrigerator	*	120
13	**Converted Indoor Firing Range – Floor**	*	**720**
14	**Converted Indoor Firing Range – Light Fixture**	*	**360**
15	**Converted Indoor Firing Range – Inside Ventilation Ductwork**	*	**1,600**
16	**Outside Indoor Firing Range – Hall Floor**	*	**440**
17	Blank	*	<12 (ug)

Key: **Bolded** results exceed listed criteria

Source: NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges

The National Guard Bureau currently utilizes 200 ug/ft^2 as a benchmark for identifying lead-contaminated surfaces. This guideline is referenced in NG PAM 420-15 "Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges" as a satisfactory surface contamination level unless the facility is utilized as a childcare facility. In such cases, U.S. Department of Housing and Urban Development (HUD)

limit of 40 ug/ft^2 on floors and 250 ug/ft^2 on windowsills should be observed. There is no child care provided at this facility.

Lead surface and air samples were collected.

- Surface levels of lead were at or above the recommended guideline of 200 ug/ft^2 in the following locations:

    - Converted Indoor Firing Range – Bullet Trap
    - Converted Indoor Firing Range – Floor
    - Converted Indoor Firing Range – Light Fixture
    - Converted Indoor Firing Range – Inside Ventilation Ductwork
    - Outside Indoor Firing Range – Hall Floor

  Cleaning procedures should be improved and remedial action should be taken to maintain lead levels on surfaces below the recommended guideline of 200 ug/ft^2.

- Air samples for lead were below the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit of 50 micrograms per cubic meter (ug/m^3).

- Paint was observed to be in good condition throughout the facility.

Section 4.0
Lighting

Section 4.0 Lighting

A lighting assessment was conducted throughout the facility. Measurements were collected using a Cooke Cal-Light 400L Precision Light Meter (Serial No. K070155). The light meter was last calibrated on September 10, 2011. Measurements collected were compared to ANSI/IESNA RP-7-01 Lighting Industrial Facilities and RP-1-04 Office Lighting.

Light Survey Assessment Summary

Location	Foot Candles (FC)	Recommended Lighting (FC)	Sufficient Lighting
Drill Hall	135.8	10	Yes
Kitchen	60.0	50	Yes
Boiler Room	67.8	30	Yes
Indoor Firing Range/Locker Room	95.5	7	Yes
Supply Office	**11.9**	**30-50**	**No**
Supply Room (Storage)	**25.5**	**30**	**No**
1st Floor Ladies Room	46.0	5	Yes
Shop Operations Office	48.7	30-50	Yes
153rd MP Office	62.4	30-50	Yes
153rd Platoon Office	48.8	30-50	Yes
153rd Orderly Office	30.0	30-50	Yes
153rd Classroom	**23.0**	**30-50**	**No**
Hallway 2nd Floor	60.2	5	Yes

Bolded results did not meet listed criteria

Source: ANSI/IESNA RP-7-01 Lighting Industrial Facilities and RP-1-04 Office Lighting.

Summary of findings and recommendations:

The lighting level did not meet the minimum recommended guideline in the supply office, supply room (storage) and 153rd classroom. Lighting should be improved in these areas.

Section 5.0
Indoor Air Quality

Section 5.0 Indoor Air Quality

Survey measurements were made for ventilation and comfort parameters (carbon dioxide, temperature, carbon monoxide and relative humidity). The air quality measurements were collected using direct reading instrumentation for comfort parameters using a QTRAK IAQ Meter, Model 7565 (Serial #7565X0839017). The IAQ Meter was last calibrated in February 11, 2011.

The American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) have developed indoor air quality guidelines for mechanically ventilated office buildings and commercial settings (ASHRAE standard 62.1-2010). ASHRAE specifies temperature and relative humidity ranges for human comfort (ASHRAE 55-2010). The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation, recommends maintaining a relative humidity range between 30 to 60% in occupied areas.

The following table summarizes the measurements collected.

IAQ Assessment Summary

Location	Temperature (◦F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)
Drill Hall	68.8	48.1	392	1.1
Kitchen	69.2	48.2	381	0.5
Boiler Room	71.1	47.0	376	0.6
Indoor Firing Range/Locker Room	72.0	44.9	679	0.9
Supply Office	70.3	50.8	448	0.8
Supply Room (Storage)	70.6	54.4	423	0.7
Shop Operations Office	70.3	51.6	413	1.0
153rd MP Office	70.2	46.0	425	0.5
153rd Platoon Office	71.2	45.4	419	1.0
153rd Orderly Office	70.9	46.4	539	1.0
153rd Classroom	71.0	46.7	590	0.5
Outdoors	67.0	44.7	361	0.2
Criteria	**68.0-79.0**	**30-60**	**<1,061**	**<9.0**

Key: **Bolded** results exceed listed criteria

Source: The American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) 55-2010 & The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation.

Summary of findings and recommendations:

- Relative humidity and Temperature levels were within the recommended criteria of 30-60% and 68.0-79.0 °F in all areas sampled.

- Carbon dioxide levels did not exceed the recommended ceiling of 1,061 parts per million (ppm). This indicates that outdoor air ventilation is adequate in all areas.

- Carbon monoxide levels were less than the recommended ceiling of 9 ppm.

- A visual inspection was conducted throughout visually accessible portions of the facility. The visual inspection was conducted to assess sources or pathways of factors potentially deleterious to IAQ. It was reported that the roof was leaking, but it is in the process of getting fixed. Some water damaged ceiling tiles were observed throughout the facility. Identify and repair the source of the water infiltration. Replace any water stained ceiling tiles.

- The HVAC supply and return grills located in some of the offices and classrooms were observed to be dirty. These should be cleaned. Do not permit dirt, debris, microbial growth, etc. to accumulate in any portion of the HVAC system.

Section 6.0

Suspect Asbestos Containing Building Materials

Section 6.0 Suspect Asbestos Containing Building Materials

Based on the age of the building (e.g., constructed in 1976) asbestos-containing materials (ACM) could be present in the facility. Suspect asbestos-containing pipe fitting insulation, boiler breeching and pipe insulation in the boiler room was observed. The pipe fittings, boiler breeching and pipe insulation were intact and in good condition. Inaccessible areas such as behind walls or crawlspaces were not inspected. No bulk samples were collected.

Section 7.0
Limitations

Section 7.0 Limitations

This report summarizes our evaluation of the conditions observed at the above referenced location. Our findings are based upon our observations and sampling results obtained at the facility at the time of our visit. The report, results, and subsequent recommendations reported herein are also limited to the information available at the time it was prepared and investigated. Conditions may have been in effect prior to the sampling events that have changed over time and which cannot be predicted within the scope of this limited investigation. Any conditions discovered which deviate from the data contained in this report should be presented to us for our evaluation.

This report is intended for the exclusive use of the client. This report and the findings herein shall not, in whole or in part, be relied upon by any other parties, disseminated or conveyed to any other party without prior written consent of the National Guard Bureau, and ALS Environmental. The findings are relative to the dates of our site visits and should not be relied upon for substantially later dates.

Appendix A
Laboratory Analysis Report

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY

LAP #100470

Client:	National Guard Bureau	**Job Name:**	RC-Scannell	**Chain Of Custody:**	511574
Address:	301-JH Old Bay Lane, Attn: ARNG-CIG-P, State Military Reservation	**Job Location:**	Delaware City, DE	**Date Submitted:**	10/13/2011
	Havre de Grace, Maryland 21078	**Job Number:**	RC-Scannell	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	10/20/2011 **Report Date:** 10/20/2011

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
12004427	110728-1	Flame	Air	528	N/A	5.7	ug/m³	<3	<5.7	ug/m³	
12004428	110728-2	Flame	Air	528	N/A	5.7	ug/m³	<3	<5.7	ug/m³	
12004429	110728-3	Flame	Air Blank	0	N/A	3	ug/m³		<3	ug	
12004430	110728-4	Flame	Wipe	****	0.108	110	ug/ft²	18	160	ug/ft²	
12004431	110728-5	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12004432	110728-6	Flame	Wipe	****	0.108	110	ug/ft²	20	190	ug/ft²	
12004433	110728-7	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12004434	110728-8	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12004435	110728-9	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12004436	110728-10	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12004437	110728-11	Flame	Wipe	****	0.108	110	ug/ft²	71	660	ug/ft²	
12004438	110728-12	Flame	Wipe	****	0.108	110	ug/ft²	13	120	ug/ft²	
12004439	110728-13	Flame	Wipe	****	0.108	110	ug/ft²	78	720	ug/ft²	
12004440	110728-14	Flame	Wipe	****	0.108	110	ug/ft²	39	360	ug/ft²	
12004441	110728-15	Flame	Wipe	****	0.108	110	ug/ft²	170	1600	ug/ft²	
12004442	110728-16	Flame	Wipe	****	0.108	110	ug/ft²	47	440	ug/ft²	
12004443	110728-17	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY

Client:	National Guard Bureau	**Job Name:**	RC-Scannell	**Chain Of Custody:**	511574
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Delaware City, DE	**Date Submitted:**	10/13/2011
	Havre de Grace, Maryland 21078	**Job Number:**	RC-Scannell	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Date Analyzed:**	10/20/2011 **Report Date:** 10/20/2011

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)

%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.

Analyst: [redacted]

Technical Manager: [redacted]

An AIHA (#100470), NVLAP (101143-0), and NY ELAP (#10920) Accredited Laboratory

4475 Forbes Blvd. · Lanham, MD, 20706 · (301) 459-2640 · Toll Free (888) 346-0951 · Fax (301) 459-2643

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4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquiries) **511574**

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0264

Submittal Information:
1. Job Name: RC-Scannell
2. Job Location: Delaware City, DE
3. Job #: RC-Scannell P.O. #: ~~W912K0-09-A-0009~~ NGB-ILHNE
4. Contact Person [redacted]
5. Submitted by: [redacted]

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled): ☐ Immediate ☐ 24 Hours Date Due: Time Due: Comments:

NORMAL BUSINESS HOURS: ☐ Immediate ☐ Next Day ☐ 2 Day ☐ 3 Day ☒ 5 Day + Date Due: 10/20/11 ☐ Results Required By Noon (Every Attempt Will Be Made to Accommodate)

REPORT TO: ☒ Incl[redacted] with Report ☒ Bill[redacted]@absglobal.com ☐ Fax[redacted]@us.army.mil ☐ Ver[redacted]@us.army.mil

Asbestos Analysis
PCM Air -- Please Indicate Filter Type:
☐ NIOSH 7400 ____ (QTY)
☐ Fiberglass ____ (QTY)
TEM Air -- Please Indicate Filter Type:
☐ AHERA ____ (QTY)
☐ NIOSH 7402 ____ (QTY)
☐ Other (specify ____) ____ (QTY)
PLM Bulk:
☐ EPA 600 -- Visual Estimate ____ (QTY)
☐ EPA Point Count ____ (QTY)
☐ NY State Friable 198.1 ____ (QTY)
☐ Grav. Reduction ELAP 198.6 ____ (QTY)
☐ Other (specify ____) ____ (QTY)
MISC:
☐ Vermiculite
☐ Asbestos Soil PLM __ (Qual) PLM __ (Quant) PLM/TEM __ (Qual) PLM/TEM __ (Quant)

TEM Bulk:
☐ ELAP 198.4 (Chatfield) ____ (QTY)
☐ NY State PLM/TEM ____ (QTY)
☐ Residual Ash ____ (QTY)
TEM Dust:
☐ Qual. (presence/abs) Vacuum/Dust ____ (QTY)
☐ Quan. (s/area) Vacuum D5755-95 ____ (QTY)
☐ Quan. (s/area) Dust D6480-99 ____ (QTY)
TEM Water:
☐ Qual. (pres/abs) ____ (QTY)
☐ ELAP 198.2/EPA 100.2 ____ (QTY)
☐ EPA 100.1 ____ (QTY)

☒ All samples received in good condition unless otherwise noted.
TEM Water samples ____ °C

Metals Analysis
☐ Pb Paint Chip ____ (QTY)
☒ Pb Dust Wipe (wipe type Ghost) 14 (QTY)
☒ Pb Air 3 (QTY)
☐ Pb Soil/Solid ____ (QTY)
☐ Pb TCLP ____ (QTY)
☐ Drinking Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
☐ Waste Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
☐ Pb Furnace (Media ____) ____ (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples: ____
Collection Media ____
☐ Spore-Trap ____ (QTY) ☐ Surface Vacuum Dust ____ (QTY)
☐ Surface Swab ____ (QTY) ☐ Culturable ID Genus (Media ____) ____ (QTY)
☐ Surface Tape ____ (QTY) ☐ Culturable ID Species (Media ____) ____ (QTY)
☐ Other (Specify ____) ____ (QTY)

SAMPLE INFORMATION

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WORK SITE	PAINT CHIP	TAPE	SWAB
1110728-1		10/13	528					X		X						
1110728-2		↓	528					X		X						
1110728-3		↓	0					X		X						
1110728-4		↓		100cm²				X				X				
1110728-5		↓		↓				X				X				
1110728-6		↓		↓				X				X				
1110728-7		↓		↓				X				X				
1110728-8		↓		↓				X				X				
1110728-9		↓		↓				X				X	[redacted]			
1110728-10		↓		↓				X				X				
1110728-11		↓		↓				X				X				
1110728-12		↓		↓				X				X				

CLIENT CONTACT (LABORATORY STAFF ONLY)

Date/Time: Contact: By:
Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: 10/13/11 @ ____ Via: UPS By (Print) [redacted]
2. Date/Time Analyzed: ___/___/___ @ ____ By (Print) [redacted]
3. Results Reported To: ____ Via: ____ Date: ___/___/___ Time: ____ Initials: ____
4. Comments: ____

DL

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AMA Analytical Services, Inc.

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(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 5157A pg2

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-H Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: RC - Scannell
2. Job Location:
3. Job #: P.O. #: W912K6-09-A-0003
4. [redacted] @ phone #: (410) 942-0273
5. Submitted by: Signature:

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due: ☐ 24 Hours Time Due: Comments:	☐ Immediate ☐ Next Day ☐ 2 Day ☐ 3 Day ☐ 5 Day+ Date Due: ☐ Results Required By Noon (Every Attempt Will Be Made to Accommodate)	☒ Include COC/Field Data Sheets with Report [redacted]@us.army.mil @us.army.mil

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 (QTY)
☐ Fiberglass (QTY)
TEM Air – Please Indicate Filter Type:
☐ AHERA (QTY)
☐ NIOSH 7402 (QTY)
☐ Other (specify) (QTY)
PLM Bulk
☐ EPA 600 – Visual Estimate (QTY)
☐ EPA Point Count (QTY)
☐ NY State Friable 198.1 (QTY)
☐ Grav. Reduction ELAP 198.6 (QTY)
☐ Other (specify) (QTY)
MISC
☐ Vermiculite
☐ Asbestos Soil PLM (Qual PLM, Quant PLM/TEM, Qual PLM/TEM, Quant)

TEM Bulk
☐ ELAP 198.4/Chatfield (QTY)
☐ NY State PLM/TEM (QTY)
☐ Residual Ash (QTY)
TEM Dust
☐ Qual. (pres/abs) Vacuum/Dust (QTY)
☐ Quant. (s/area) Vacuum D5755-95 (QTY)
☐ Quant. (s/mass) Dust D6480-99 (QTY)
TEM Water
☐ Qual. (pres/abs) (QTY)
☐ ELAP 198.2/EPA 100.2 (QTY)
☐ EPA 100.1 (QTY)

☐ All samples received in good condition unless otherwise noted. (TEM Water samples ___°C)

Metals Analysis
☐ Pb Paint Chip (QTY)
☐ Pb Dust Wipe (wipe type ___) (QTY)
☐ Pb Air (QTY)
☐ Pb Soil/Solid (QTY)
☐ Pb TCLP (QTY)
☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Pb Furnace (Media ___) (QTY)
Fungal Analysis
Collection Apparatus for Spore Trap/Air Samples:
Collection Media:
☐ Spore Trap (QTY) ☐ Surface Vacuum Dust (QTY)
☐ Surface Swab (QTY) ☐ Culturable ID Genus (Media ___) (QTY)
☐ Surface Tape (QTY) ☐ Culturable ID Species (Media ___) (QTY)
☐ Other (Specify) (QTY)

SAMPLE INFORMATION / ANALYSIS / MATRIX

CLIENT ID NUMBER	SAMPLE LOCATION IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEST	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER/SOIL/OTHER	SPORE TRAP	TAPE	SWAB
1110728-13		10/7		100cm²				X				X				
1110728-14		↓		↓				X				X				
1110728-15								X				X				
1110728-16								X				X				
1110728-17		↓		0cm²				X				X				

CLIENT CONTACT (LABORATORY STAFF ONLY)
Date/Time: Contact: By:
Date/Time: Contact: By:
Date/Time: Contact: By:

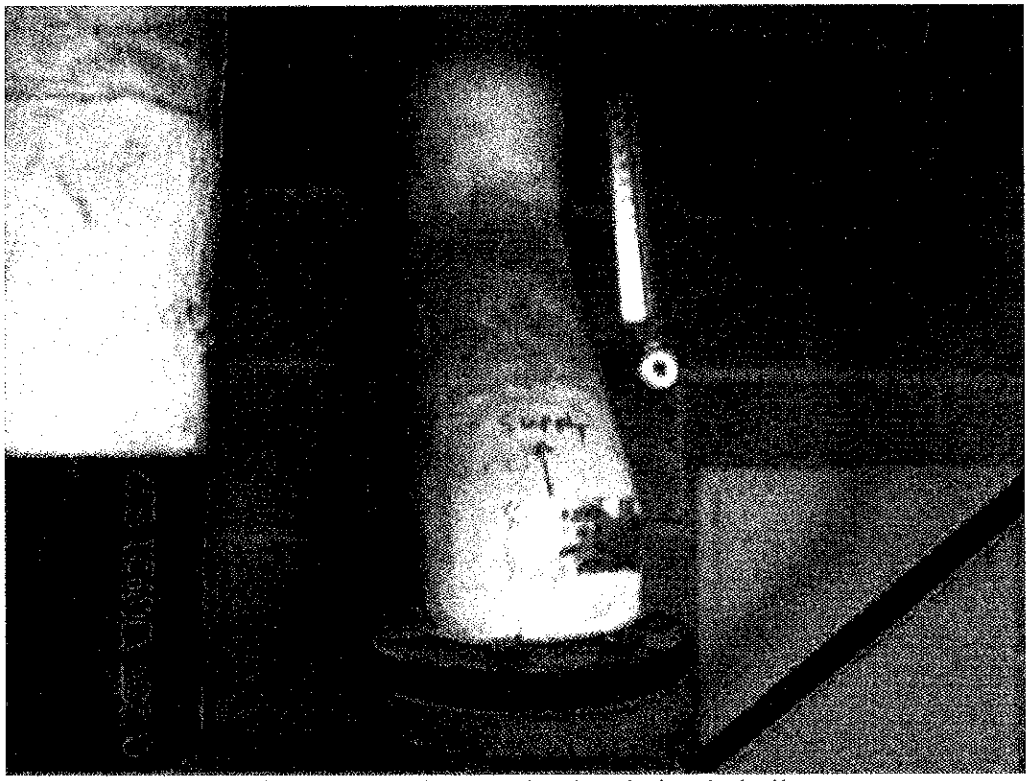
LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: / / @ Via: By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments:

BEST AVAILABLE COPY

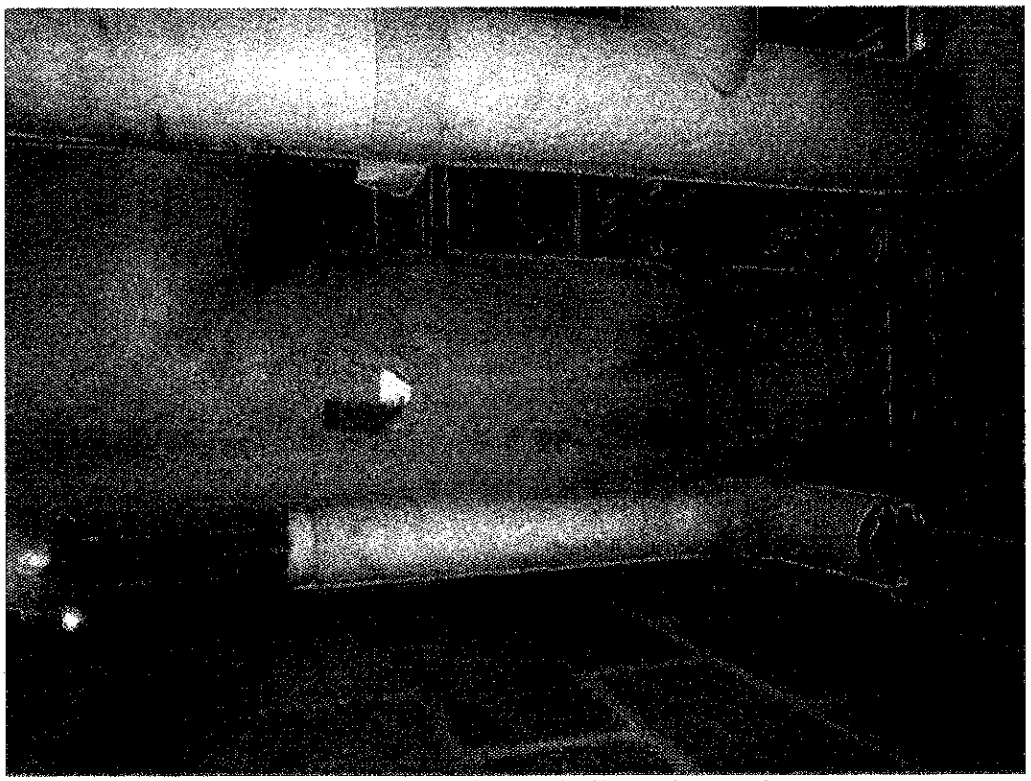
Appendix B
Photographs

RC Scannell- Exterior

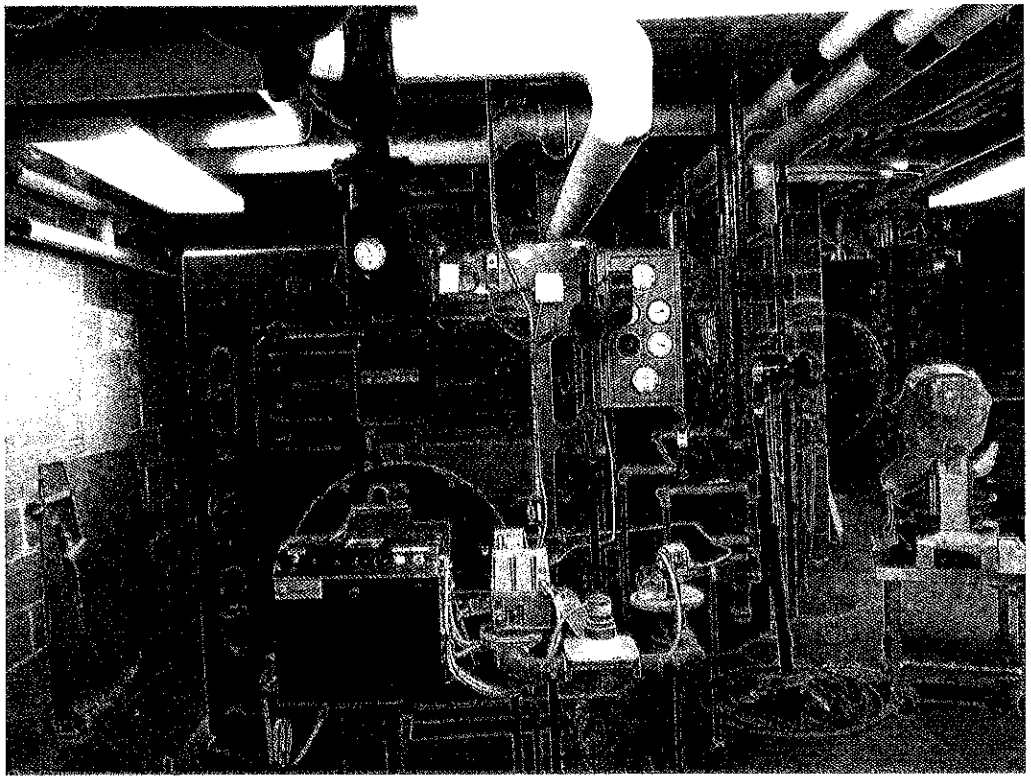
RC Scannell- Drill Hall



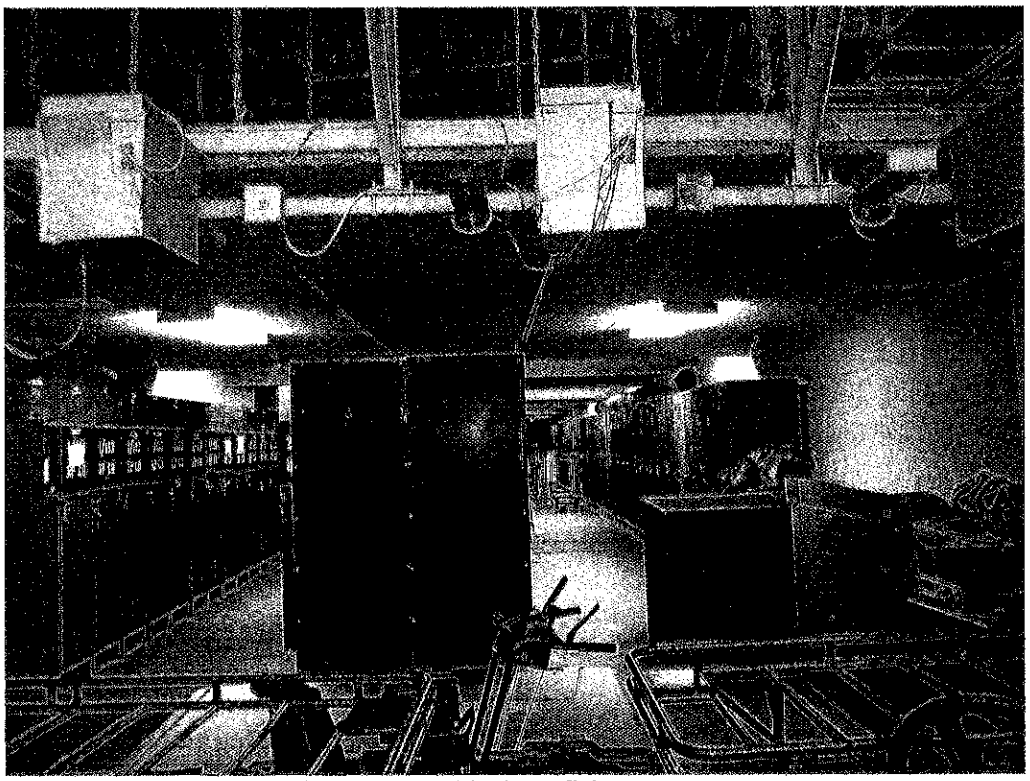
RC Scannell- Suspect asbestos pipe insulation in boiler room



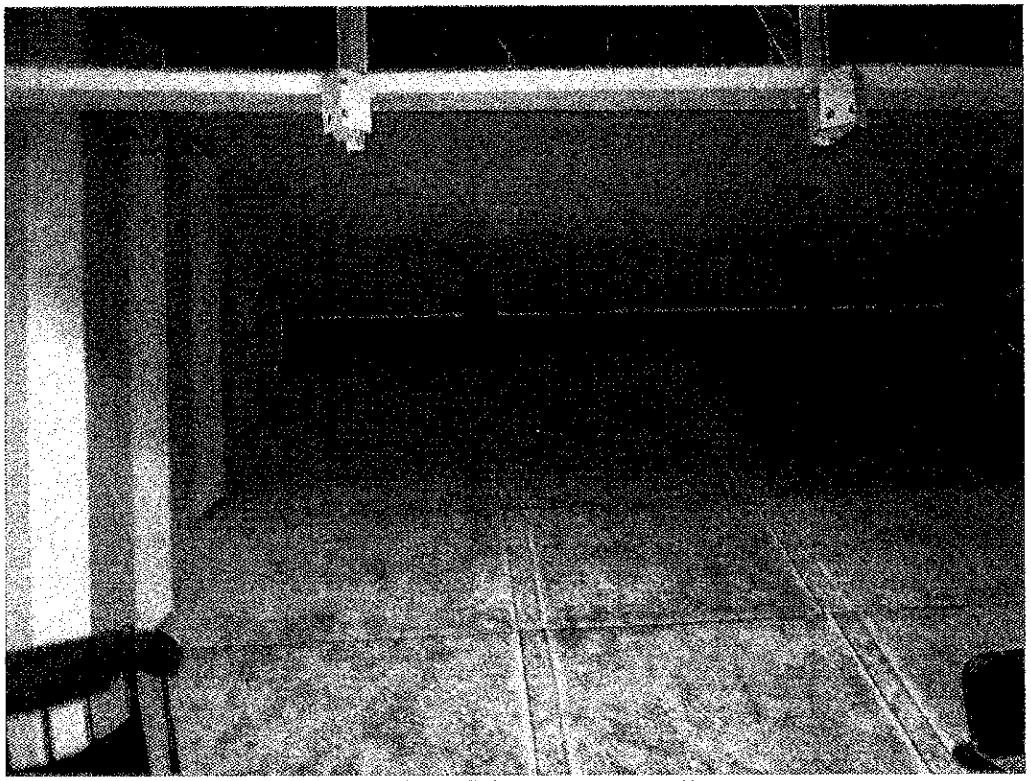
RC Scannell- Suspect asbestos boiler exhaust pipe



RC Scannell- Boiler

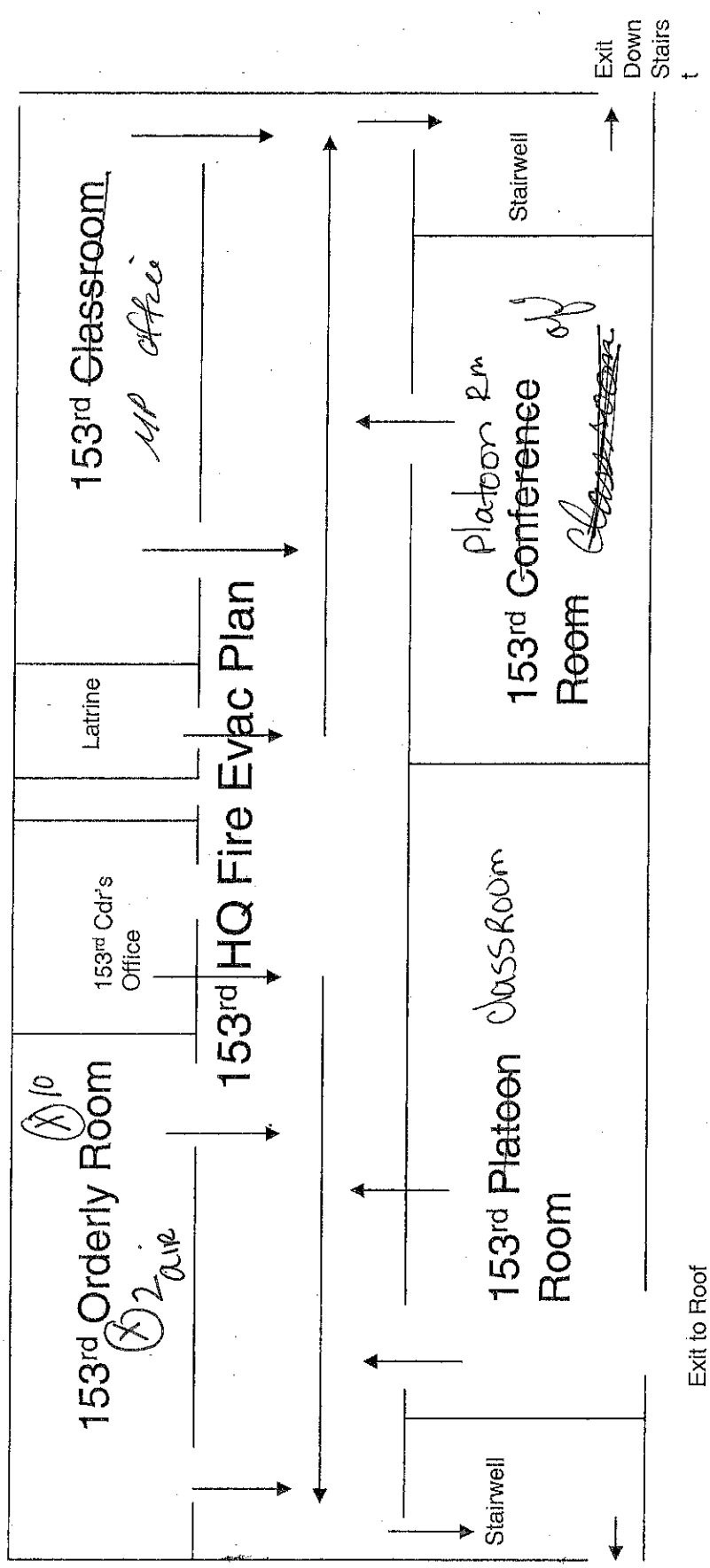


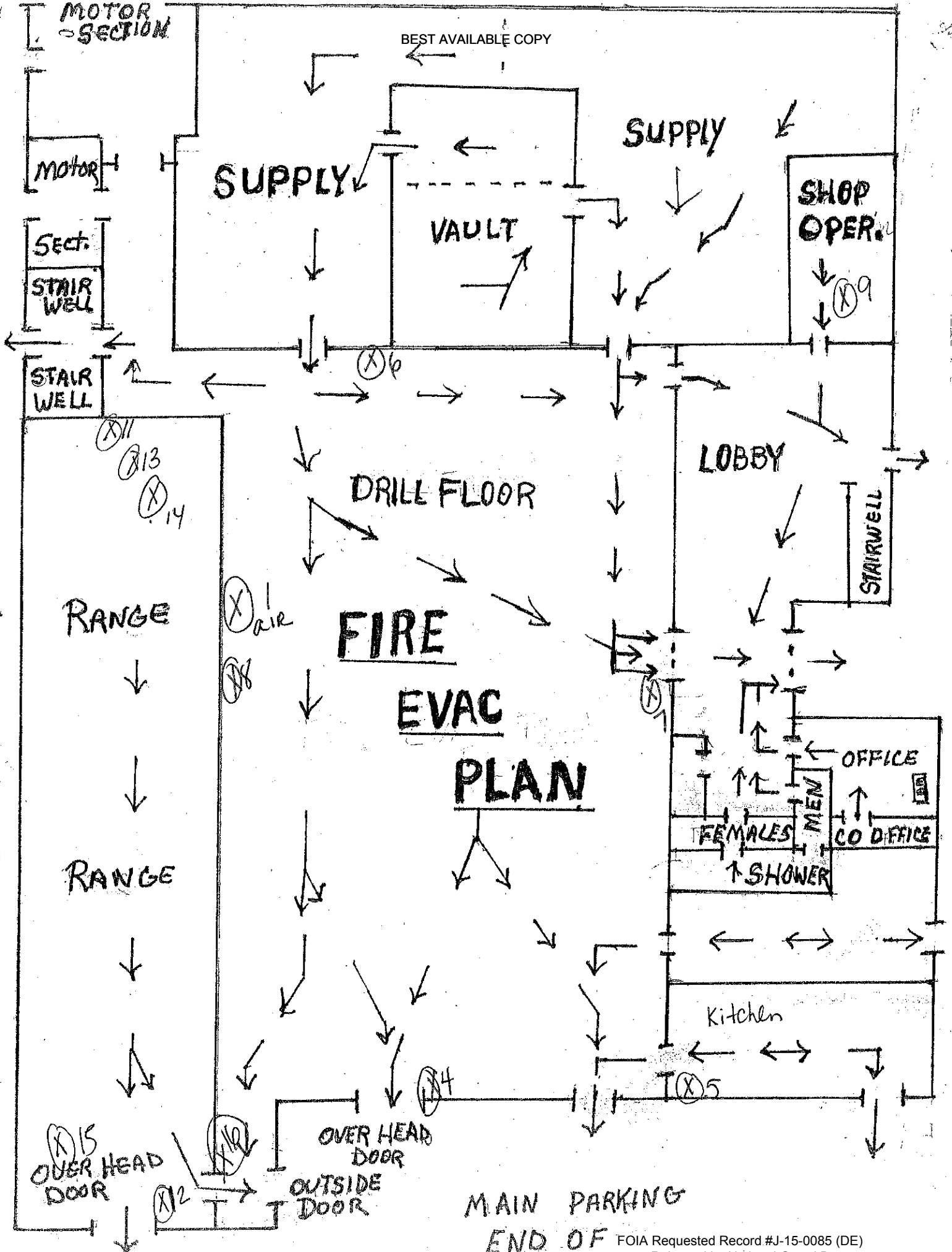
RC Scannell- Converted indoor firing range



RC Scannell- Indoor firing range – Bullet trap

Appendix C
Floor Plan





Appendix D
References

Appendix D. References

1. Title 29 Code of Federal Regulations (CFR), Part 1910.1025, Occupational Safety and Health Administration, Occupational Exposure to Lead

2. American Conference of Governmental Industrial Hygienists (ACGIH) – Threshold Limit Values and Biological Exposure Indices, 2011 Edition

3. Industrial Ventilation: A Manual of Recommended Practice for Design, 27th Edition

4. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Ventilation for Acceptable Indoor Air Quality, 62.1-2010

5. RP-1-2004, Industrial Lighting, Illuminating Engineering Society of North America/ANSI

6. RP-7-2001, Industrial Lighting, Illuminating Engineering Society of North America/ANSI

7. National Emission Standard Hazardous Air Pollutants (NESHAP) – The standards for asbestos are contained in 40 CFR 61.140 through 61.157.

8. Environmental Protection Agency (EPA) standards [40 Code of Federal Regulations (CFR) 745.227(h)(3)]

9. Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM)

10. The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation

11. NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 NOV 06.

12. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Thermal Environmental Conditions for Human Occupancy, 55-2010.

COMPLIANCE MANAGEMENT INTERNATIONAL

1215 Manor Drive, Suite 205
Mechanicsburg, PA 17055
Phone: 717.590.7031
Fax: 717.590.7936
www.complianceplace.com

Industrial Hygiene Survey Report

National Guard Facility
Scannell Readiness Center

Prepared For:	**National Guard Bureau Region North** **301-IH Old Bay Lane** **Havre de Grace, MD 21078**
Survey Location:	**Joseph J. Scannell Readiness Center** **Governor Bacon Health Center** **Delaware City, DE 19706**
Prepared By:	**Compliance Management International (CMI)** **1215 Manor Drive** **Suite 205** **Mechanicsburg, PA 17055**
Survey Date:	**November 5, 2012**
Report Date:	**January 21, 2013**

Non-Responsive

Manager, Industrial Hygiene Services

Table of Contents

Section 1.0 Executive Summary

An industrial hygiene survey was conducted on November 5, 2012 at the Joseph J. Scannell Readiness Center located at the Governor Bacon Health Center, 248 Kent Avenue, Delaware City, DE 19706. The survey was performed by Mr Non-Responsive

1. Lead surface and air samples were collected. Surface levels of lead exceeded 200 micrograms per square foot (ug/ft2) in three locations associated with the converted indoor firing range. Air samples were below the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL). See Section 3.0 for sampling results.

2. Lighting levels did not meet the American National Standard Institute/Illuminating Engineering Society of North America (ANSI/IESNA) recommended guideline in the Storage - Supply Area and the 153rd Classroom. See Section 4.0 for sampling results.

3. Indoor air quality (IAQ) parameters of temperature, relative humidity, carbon monoxide and carbon dioxide (ventilation) were evaluated during the assessment. Temperature and relative humidity measurements were outside the recommended guidelines in all areas sampled. Heating Ventilation and Air-conditioning (HVAC) systems were not believed to be on (e.g., occupied mode) in some areas. Sample results were within regulatory standards and/or recommended guidelines for carbon monoxide and carbon dioxide. See Section 5.0 for sampling results.

4. Presumed asbestos-containing materials (PACM), where visible, were intact and in good condition. See Section 6.0 for detailed findings.

Section 2.0 Operation Description & Observations

The Joseph J. Scannell Readiness Center is mainly an administrative facility with a drill hall, administrative offices, classrooms and storage areas. There were approximately 10 full-time employees stationed at this facility at the time of this survey.

The building was constructed in the mid 1970s and is a two story structure with brick exterior walls, and a flat roof (replaced in 2011). Interior walls are a mix of concrete block and drywall. The floors are concrete, vinyl floor tile, and carpet. The building is set in a rural environment. This facility was acquired the facility in 1992.

The propane-fired, HVAC system present in the drill hall appeared to be in good condition. Multiple air-conditioning units are mounted on the rooftop, but could not be inspected at the time of the survey. The HVAC systems were believed to be in limited use at the time of this survey due to minimal occupancy in the building. However, the staff on site could not confirm this.

The firing range has been converted into a locker/storage area. However, the bullet trap remains. This area appeared to be clean and well kept.

No vehicle or shop area exists at the facility. There is no attached garage at the facility.

There are no child-care services in the building.

Overall housekeeping practices were good.

Ms. Non-Responsive, RN, BSN, COHN-S State Occupational Health Nurse, was present during part of the survey.

Section 3.0 Lead Testing

Due to the age of the building there is the potential for lead based paint to be present. Various surfaces within the facility were screened for lead using surface wipe samples. Surface wipe samples were collected in accordance with the American Society for Testing and Materials (ASTM) E 1792 protocols. Air samples were collected using 0.8 um mixed cellulose ester (MCE) filter cassettes attached to low volume air sampling pumps. Blank samples were submitted to the laboratory for quality control purposes. Samples were sent to AMA Analytical Services, Inc., in Lanham, Maryland, for lead analysis using Environmental Protection Agency (EPA) Method 600/R-93/200 (M)-7420. A copy of the laboratory analysis report can be found in Appendix A.

Lead Testing Results Summary

Sample #	Location	Air ug/m^3	Surface ug/ft^2
1	Converted Firing Range	<3.7	*
2	Drill Hall	<3.7	*
3	Floor - Center of Drill Hall	*	<110
4	Drill Hall – Top of Wall Locker	*	<110
5	Kitchen - Top of Desk	*	<110
6	Kitchen – Top of Wall Locker	*	<110
7	Drill Hall – Top of Soda Machine	*	160
8	Converted Firing Range – Floor	*	**250**
9	Converted Firing Range – Bullet Trap	*	**360**
10	Converted Firing Range – Top of Wall Locker	*	<110
11	Converted Firing Range – HVAC Supply Diffuser Grill	*	**16,000**
12	Readiness Office – Window Sill	*	<110
13	Supply Office – Top of Book Shelf	*	<110
14	Conference Room – Conference Table	*	<110
15	153rd Classroom – Top of Desk	*	<110
16	153rd Classroom – Top of File Cabinet	*	<110
17	Wipe Blank	*	<12 (ug)
18	Short Hall off Converted Firing Range – Floor	*	120
19	Air Blank	*	<3 (ug)

Key: **Bolded** results exceed listed criteria
ug/ft^2 – micrograms per square foot
ug/ft^3 – micrograms per cubic meter

Source: NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges

The National Guard Bureau currently utilizes 200 ug/ft^2 as a benchmark for identifying lead-contaminated surfaces. This guideline is referenced in NG PAM 420-15 "Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges"

as a satisfactory surface contamination level unless the facility is utilized as a childcare facility. In such cases, U.S. Department of Housing and Urban Development (HUD) limit of 40 ug/ft^2 on floors and 250 ug/ft^2 on windowsills should be observed. There is no child care provided at this facility.

Lead surface and air samples were collected.

- Surface levels of lead were at or above the recommended guideline of 200 ug/ft^2 in the following locations:

    - Converted Firing Range – Floor
    - Converted Indoor Firing Range – Bullet Trap
    - Converted Indoor Firing Range – HVAC Supply Diffuser

    Cleaning procedures should be improved and remedial action should be taken to maintain lead levels on surfaces below the recommended guideline of 200 ug/ft^2.

- Air samples for lead were below the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit of 50 micrograms per cubic meter (ug/m^3).

- Paint was observed to be in good condition throughout the facility.

Section 4.0 Lighting

A lighting assessment was conducted throughout the facility. Measurements were collected using a Cooke Cal-Light 400L Precision Light Meter (Serial No. K98364). The light meter was last calibrated in April 2012. Measurements collected were compared to ANSI/IESNA RP-7-01 Lighting Industrial Facilities and RP-1-04 Office Lighting.

Light Survey Assessment Summary

Location	Foot Candles (FC)	Recommended Lighting (FC)	Sufficient Lighting
Drill Hall	18.9	10	Yes
Storage Area - Supply Room	**10.8**	**30**	**No**
Converted Firing Range – Storage	27.2	10	Yes
Kitchen	76.5	50	Yes
Boiler Room	88.5	30	Yes
Readiness Room	31.5	30	Yes
Conference Room	64.2	30	Yes
153rd Classroom	**28.5**	**30-50**	**No**

Bolded results did not meet listed criteria
FC = Foot Candles

Source: ANSI/IESNA RP-7-01 Lighting Industrial Facilities and RP-1-04 Office Lighting.

Summary of findings and recommendations:

The lighting level did not meet the minimum recommended guideline in the supply area and the 153rd classroom. Lighting should be improved in these areas.

Section 5.0 Indoor Air Quality

Survey measurements were made for ventilation and comfort parameters (carbon dioxide, temperature, carbon monoxide and relative humidity). The air quality measurements were collected using direct reading instrumentation for comfort parameters using a QTRAK IAQ Meter, Model 7565 (Serial #02041015). The IAQ Meter was last calibrated in August 2012.

The American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) have developed indoor air quality guidelines for mechanically ventilated office buildings and commercial settings (ASHRAE standard 62.1-2010). ASHRAE specifies temperature and relative humidity ranges for human comfort (ASHRAE 55-2010). The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation, recommends maintaining a relative humidity range between 30 to 60% in occupied areas.

The following table summarizes the measurements collected.

IAQ Assessment Summary

Location	Temperature (◦F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)
Drill Hall	**67.5**	**28.4**	410	1.9
Kitchen	**66.2**	30.3	404	1.6
Boiler Room	69.1	**24.9**	503	1.3
Converted Firing Range	**65.7**	**26.3**	367	1.5
Supply Area	**67.5**	35.6	461	2.3
Readiness Office	**67.1**	**28.3**	466	1.7
Conference Room	**65.7**	**29.0**	507	1.9
153rd Classroom	**66.6**	30.6	424	2.1
Outdoors	55.0	30.3	314	0.0
Criteria	**68.0-79.0**	**30-60**	**<1,014**	**<9.0**

Key: **Bolded** results exceed listed criteria
PPM = Parts per million

Source: The American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) 55-2010, 62.1-2010 & The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation.

Summary of findings and recommendations:

- Temperature and relative humidity measurements were outside the recommended guidelines for comfort (30-60% and 68.0-79.0 °F) in all areas sampled.

- Carbon dioxide levels did not exceed the recommended ceiling of 1,014 parts per million (ppm). This indicates that outdoor air ventilation is adequate in all areas.

- Carbon monoxide levels were less than the recommended ceiling of 9 ppm.
- A visual inspection was conducted throughout accessible portions of the facility. The visual inspection was conducted to assess sources or pathways of factors potentially deleterious to IAQ. The following observations and conditions were noted at the time of this survey.

    - It was reported that a roof-top mounted AC unit had leaked during the recent summer, causing slight water damage to several ceiling tiles (one tile exhibited a small amount of fungal growth) and a water stain on the carpet in the conference room. The unit was repaired.

    - Three water damaged ceiling tiles were observed in the main lobby. Identify and repair the source of the water infiltration. Replace any water stained ceiling tiles.

Section 6.0 Suspect Asbestos Containing Building Materials

Based on the age of the building (e.g., originally constructed in 1976) asbestos-containing materials (ACM) could be present in the facility.

Presumed asbestos-containing materials (PACM) were observed in the following areas:

1. Mudded pipe fittings were observed in the drill hall, mechanical room, supply area, boiler room, and motor-pool area. These were observed to be intact and in good condition. Fittings could be present in other locations including hidden areas such as behind walls and ceilings.

2. Breeching (approx 50 ft^2) was observed in the boiler room. It was observed to be intact and in good condition.

Inaccessible areas such as behind walls or crawlspaces were not inspected and no bulk samples were collected.

Section 7.0 Equipment

The following equipment was utilized during this survey. All sampling equipment was properly calibrated prior to use and verified for accuracy as applicable. See daily reports and calibrations logs for detailed information.

Equipment	Serial #	Calibration Date	Value
TSI QTrak IAQ Meter	02041015	8/2012	NA
Cal Light 400 Light Meter	K98364	4/2012	NA
TSI 4199 Calibrator	41460827002	8/2012	NA
SKC Air Sampling Pump	648349	11/2/2012	2.45 LPM
SKC Air Sampling Pump	647610	11/2/2012	2.45 LPM

Section 8.0 Limitations

This report summarizes our evaluation of the conditions observed at the above referenced location. Our findings are based upon our observations and sampling results obtained at the facility at the time of our visit. The report, results, and subsequent recommendations reported herein are also limited to the information available at the time it was prepared and investigated. Conditions may have been in effect prior to the sampling events that have changed over time and which cannot be predicted within the scope of this limited investigation. Any conditions discovered which deviate from the data contained in this report should be presented to us for our evaluation.

This report is intended for the exclusive use of the client. This report and the findings herein shall not, in whole or in part, be relied upon by any other parties, disseminated or conveyed to any other party without prior written consent of the National Guard Bureau, and Compliance Management International. The findings are relative to the dates of our site visits and should not be relied upon for substantially later dates.

Appendix A. Laboratory Analysis Report

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Not Provided	**Chain Of Custody:**	514484
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Joseph J Scannell Armory	**Date Submitted:**	11/13/2012
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/16/2012 **Report Date:** 11/16/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Total ug	Final Result		Comments
13014224	1	Flame	Air	816	N/A	3.7	ug/m^3	<3	<3.7	ug/m^3	
13014225	2	Flame	Air	816	N/A	3.7	ug/m^3	<3	<3.7	ug/m^3	
13014226	3	Flame	Wipe	****	0.111	110	ug/ft^2	<12	<110	ug/ft^2	
13014227	4	Flame	Wipe	****	0.111	110	ug/ft^2	<12	<110	ug/ft^2	
13014228	5	Flame	Wipe	****	0.111	110	ug/ft^2	<12	<110	ug/ft^2	
13014229	6	Flame	Wipe	****	0.111	110	ug/ft^2	<12	<110	ug/ft^2	
13014230	7	Flame	Wipe	****	0.111	110	ug/ft^2	18	160	ug/ft^2	
13014231	8	Flame	Wipe	****	0.111	110	ug/ft^2	28	250	ug/ft^2	
13014232	9	Flame	Wipe	****	0.111	110	ug/ft^2	40	360	ug/ft^2	
13014233	10	Flame	Wipe	****	0.111	110	ug/ft^2	<12	<110	ug/ft^2	
13014234	11	Flame	Wipe	****	0.111	110	ug/ft^2	1700	16000	ug/ft^2	
13014235	12	Flame	Wipe	****	0.111	110	ug/ft^2	<12	<110	ug/ft^2	
13014236	13	Flame	Wipe	****	0.111	110	ug/ft^2	<12	<110	ug/ft^2	
13014237	14	Flame	Wipe	****	0.111	110	ug/ft^2	<12	<110	ug/ft^2	
13014238	15	Flame	Wipe	****	0.111	110	ug/ft^2	<12	<110	ug/ft^2	
13014239	16	Flame	Wipe	****	0.111	110	ug/ft^2	<12	<110	ug/ft^2	
13014240	17	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	
13014241	18	Flame	Wipe	****	0.111	110	ug/ft^2	14	120	ug/ft^2	
13014242	19	Flame	Air Blank	0	N/A	3	ug/m^3		<3	ug	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

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ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Not Provided	**Chain Of Custody:**	514484
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Joseph J Scannell Armory	**Date Submitted:**	11/13/2012
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/16/2012 **Report Date:** 11/16/2012

Attention: Non-Responsive

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B
N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)
%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)
Note: All samples were received in good condition unless otherwise noted.
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.

Analys Non-Responsive

Technical Manager: Non-Responsive

OWI (410) 247-2024 159202 210 REV. 6.08

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To Th Number For Inquire 514484

page 1 of 2

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name:
2. Job Location: Joseph J Seanell Armory 11/5/12
3. Job #:
4. Contact Person
5. Submitted by:

Non-Responsive

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)
☐ Immediate Date Due:
☐ 24 Hours Time Due:
Comments:

NORMAL BUSINESS HOURS
☐ Immediate ☐ 3 Day
☐ Next Day ☒ 5 Day + Date Due: 11/20/12
☐ 2 Day ☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

REPORT TO:
☒ Include COC/Field Data Sheets with Report
☒ Email: Non-Responsive @us.army.mil
☐ Fax: @us.army.mil
☐ Verb

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 (QTY)
☐ Fiberglass (QTY)
TEM Air – Please Indicate Filter Type:
☐ AHERA (QTY)
☐ NIOSH 7402 (QTY)
☐ Other (specify) (QTY)
PLM Bulk
☐ EPA 600 – Visual Estimate (QTY)
☐ EPA Point Count (QTY)
☐ NY State Friable 198.1 (QTY)
☐ Grav. Reduction ELAP 198.6 (QTY)
☐ Other (specify) (QTY)
MISC
☐ Vermiculite
☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
☐ ELAP 198.4/Chatfield (QTY)
☐ NY State PLM/TEM (QTY)
☐ Residual Ash (QTY)
TEM Dust
☐ Qual. (pres/abs) Vacuum/Dust (QTY)
☐ Quan. (s/area) Vacuum D5755-95 (QTY)
☐ Quan. (s/area)Dust D6480-99 (QTY)
TEM Water
☐ Qual. (pres/abs) (QTY)
☐ ELAP 198.2/EPA 100.2 (QTY)
☐ EPA 100.1 (QTY)

☒ All samples received in good condition unless otherwise noted. (TEM Water samples °C)

Metals Analysis
☐ Pb Paint Chip (QTY)
☐ Pb Dust Wipe (wipe type Ghost wipe) 16 (QTY)
☐ Pb Air 3 (QTY)
☐ Pb Soil/Solid (QTY)
☐ Pb TCLP (QTY)
☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Pb Furnace (Media) (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
☐ Spore-Trap (QTY) ☐ Surface Vacuum Dust (QTY)
☐ Surface Swab (QTY) ☐ Culturable ID Genus (Media) (QTY)
☐ Surface Tape (QTY) ☐ Culturable ID Species (Media) (QTY)
☐ Other (Specify) (QTY)

CLIENT ID NUMBER	SAMPLE INFORMATION: SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	MATRIX: AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
1.	Firing Range	11/5	~~515.55~~	8/6				X								
2.	Drill Hall	↓	~~515.55~~	8/6				X								
3	Drill Hall Floor		~~515.55~~	4"x4"				X								
4.	Drill Hall locker			4"x4"				X								
5	Kitchen Desk			4"x4"				X								
6	Kitchen wall locker			4"x4"				X								
7	Drill Hall Soda machine			4"x4"				X								
8	Firing Range Floor			4"x4"				X								
9	Firing Range Target			4"x4"				X								
10	Firing Range locker			4"x4"				X								
11.	Firing Range AR Stand			4"x4"				X								
12	Readyroom office	(wooden sill		4"x4"				X								

CLIENT CONTACT
(LABORATORY STAFF ONLY)
Date/Time: Contact: By:
Date/Time: Contact: By:
Date/Time: Contact: By:

Non-Responsive

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: 11 / 13 / 12 @ 1000 Via: FedEx By (Print):
2. Date/Time Analyzed: / / @ By (Print):
3. Results Reported To: Via: Date: / /
4. Comments: 459 3323 2037

OWI (410) 247-2024

159202 210 REV. 6.08

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 5144 84

page 2 of 2

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name:
2. Job Location: Joseph J Shannon Armory
3. Job #:
4. Contact Person
5. Submitted By:

Non-Responsive

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)
☐ Immediate Date Due:
☐ 24 Hours Time Due:
Comments:

NORMAL BUSINESS HOURS
☐ Immediate ☐ 3 Day
☐ Next Day ☐ 5 Day +
☐ 2 Day Date Due:
☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
☒ Include COC/Field Data Sheets with Report
☒ Email: Non-Responsive us.army.mil
☐ Fax:
☐ Ver us.army.mil

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 (QTY)
☐ Fiberglass (QTY)
TEM Air – Please Indicate Filter Type:
☐ AHERA (QTY)
☐ NIOSH 7402 (QTY)
☐ Other (specify) (QTY)
PLM Bulk
☐ EPA 600 – Visual Estimate (QTY)
☐ EPA Point Count (QTY)
☐ NY State Friable 198.1 (QTY)
☐ Grav. Reduction ELAP 198.6 (QTY)
☐ Other (specify) (QTY)
MISC
☐ Vermiculite
☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
☐ ELAP 198.4/Chatfield (QTY)
☐ NY State PLM/TEM (QTY)
☐ Residual Ash (QTY)
TEM Dust
☐ Qual. (pres/abs) Vacuum/Dust (QTY)
☐ Quan. (s/area) Vacuum D5755-95 (QTY)
☐ Quan. (s/area)Dust D6480-99 (QTY)
TEM Water
☐ Qual. (pres/abs) (QTY)
☐ ELAP 198.2/EPA 100.2 (QTY)
☐ EPA 100.1 (QTY)

☐ All samples received in good condition unless otherwise noted.
(TEM Water samples °C)

Metals Analysis
☐ Pb Paint Chip (QTY)
☐ Pb Dust Wipe (wipe type) (QTY)
☐ Pb Air (QTY)
☐ Pb Soil/Solid (QTY)
☐ Pb TCLP (QTY)
☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Pb Furnace (Media) (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
☐ Spore-Trap (QTY) ☐ Surface Vacuum Dust (QTY)
☐ Surface Swab (QTY) ☐ Culturable ID Genus (Media) (QTY)
☐ Surface Tape (QTY) ☐ Culturable ID Species (Media) (QTY)
☐ Other (Specify) (QTY)

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	MATRIX: AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
13	Supply office Book shelf	7/15		4"x4"				X								
14	Conference Room table			4"x4"				X								
15	153rd Classroom Desk			4"x4"				X								
16	153rd side office File cabinet			4"x4"				X								
17	Blank			0				X								
18	Hall out side of Firing Range			4"x4"				X								
19	Blank		0					X								

CLIENT CONTACT
(LABORATORY STAFF ONLY)
Date/Time: Contact: By:
Date/Time: Contact: By:
Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: / / @ Via: By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time:
4. Comments:

Appendix B. Photographs

Exterior of facility

Drill hall

Converted firing range

Mechanical room

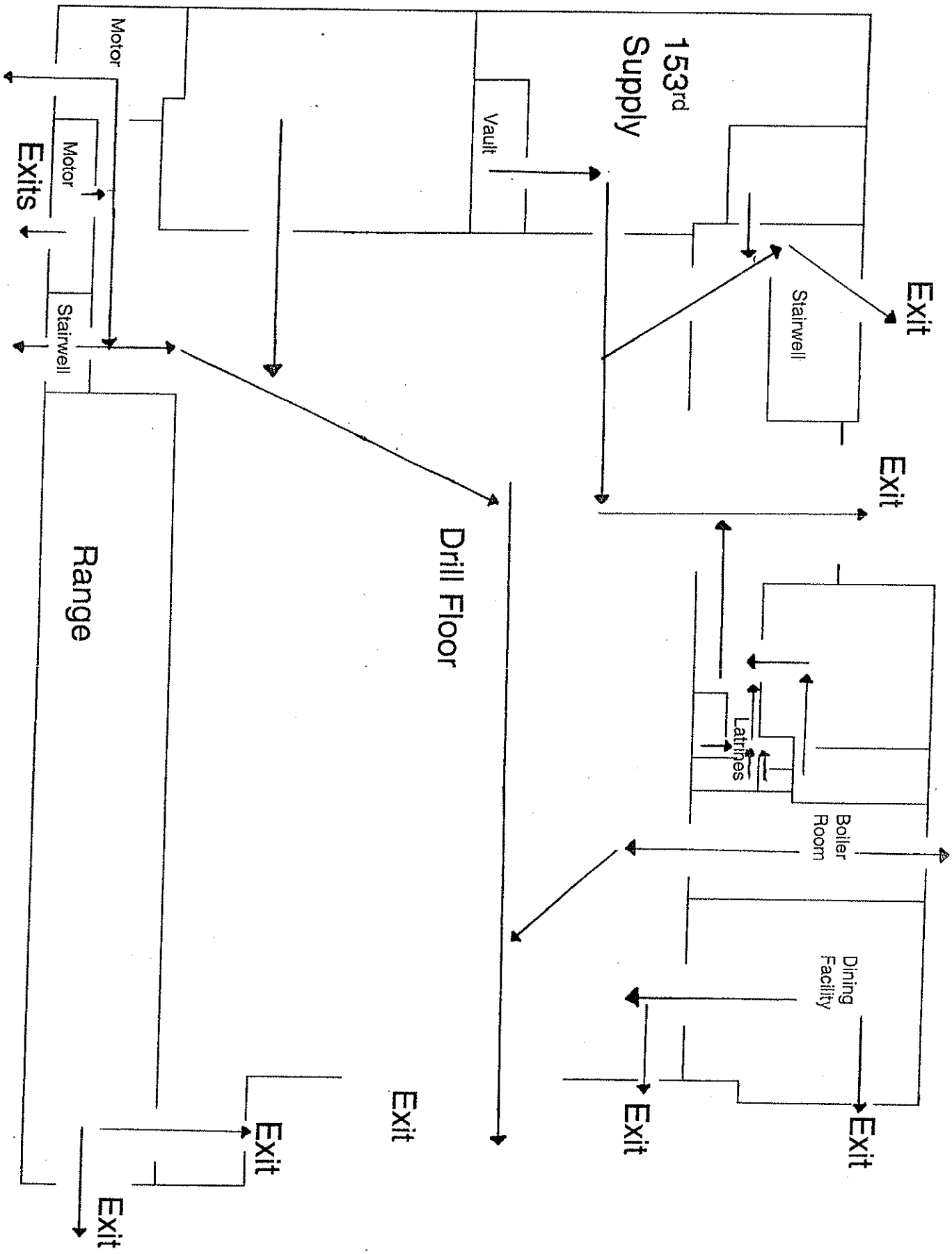
Mechanical room breeching possible ACM in good condition

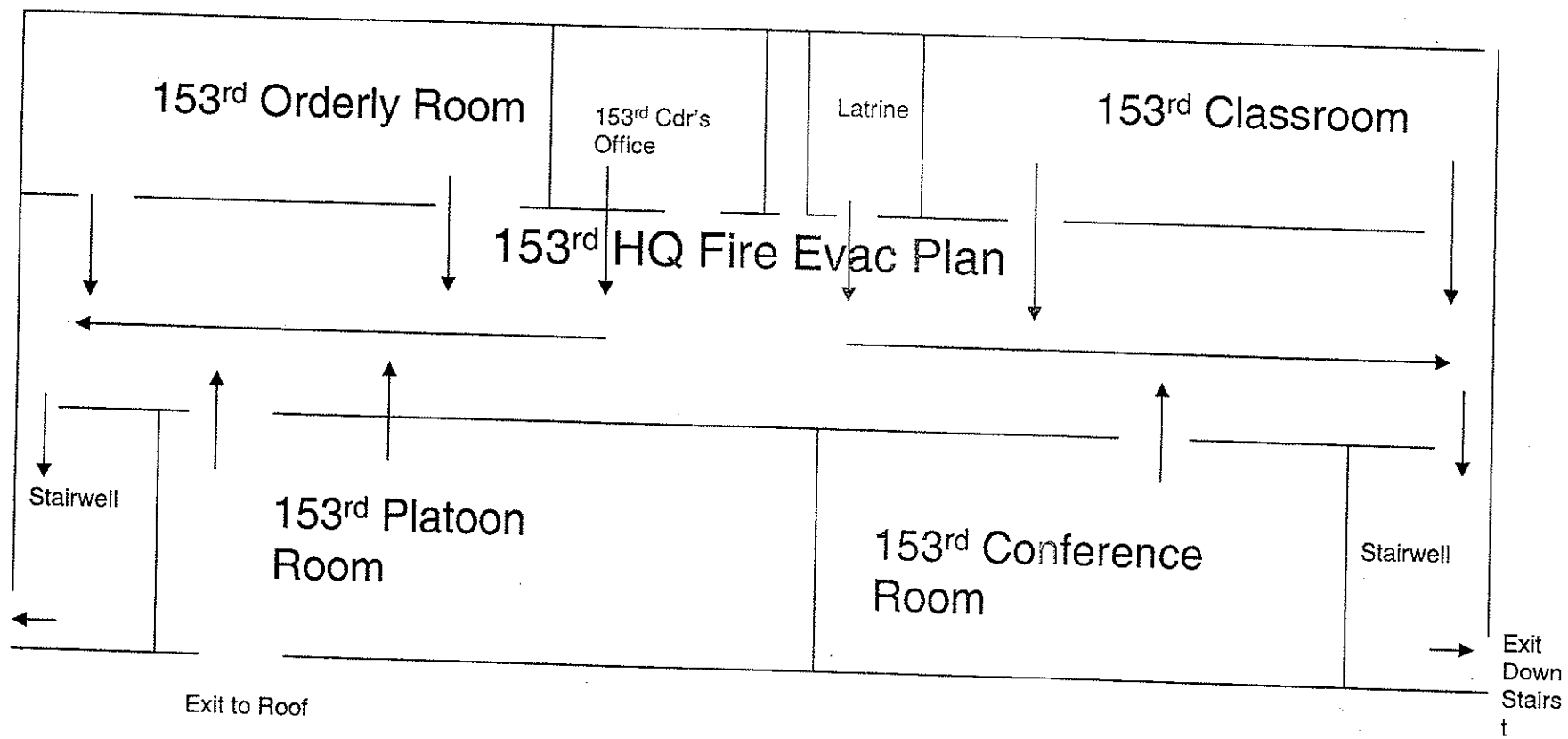
Mechanical room mudded pipe fitting possible ACM in good condition

Conference room water stain on carpet from above ceiling mounted UV that leaked condensate water

Conference room visible fungal growth, missing, and water stained ceiling tiles from above ceiling mounted UV that leaked condensate water

Appendix C. Floor Plan





Appendix D. References

1. Title 29 Code of Federal Regulations (CFR), Part 1910.1025, Occupational Safety and Health Administration, Occupational Exposure to Lead

2. American Conference of Governmental Industrial Hygienists (ACGIH) – Threshold Limit Values and Biological Exposure Indices, 2011 Edition

3. Industrial Ventilation: A Manual of Recommended Practice for Design, 27th Edition

4. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Ventilation for Acceptable Indoor Air Quality, 62.1-2010

5. RP-1-2004, Industrial Lighting, Illuminating Engineering Society of North America/ANSI

6. RP-7-2001, Industrial Lighting, Illuminating Engineering Society of North America/ANSI

7. National Emission Standard Hazardous Air Pollutants (NESHAP) – The standards for asbestos are contained in 40 CFR 61.140 through 61.157.

8. Environmental Protection Agency (EPA) standards [40 Code of Federal Regulations (CFR) 745.227(h)(3)]

9. Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM)

10. The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation

11. NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 NOV 06.

12. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Thermal Environmental Conditions for Human Occupancy, 55-2010.

NATIONAL GUARD BUREAU
ARMY NATIONAL GUARD
NORTH REGION INDUSTRIAL HYGIENE OFFICE
301-IH OLD BAY LANE
HAVRE DE GRACE MD 21078

INDUSTRIAL HYGIENE SURVEY
SURFACE WIPE SAMPLING FOR LEAD
SCANNELL FORMER INDOOR FIRING RANGE
DELAWARE CITY, DE – 26 JUNE 2013

1. REFERENCES. See Appendix A.

2. PURPOSE. The purpose of this Industrial Hygiene (IH) survey was to evaluate the progress of the decontamination and conversion project at the former indoor firing range (IFR) in the Scannell Readiness Center at 248 Kent Ave in Delaware City, Delaware.

3. GENERAL.

a. Background.

(1) The Delaware Army National Guard (DEARNG) Facilities Management office initiated a project to decontaminate and convert former IFRs in multiple facilities throughout the state.

(2) A contractor was hired to manage the project and was responsible for the oversight of the cleaning, decontamination, and conversion of each former IFR. The contractor then subcontracted with an independent firm to verify any remaining lead levels were below the 200 micrograms per square foot ($\mu g/ft^2$) limit as published in National Guard Pamphlet (NG PAM) 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges (reference 1).

(3) Once the contractor reported all facilities were below the 200 $\mu g/ft^2$ limit, the Army National Guard (ARNG) North Region Industrial Hygiene (IH) office's assistance was requested in order to verify the contractor's reports.

b. Survey Personnel. This survey was conducted on 26 June 2013 by:

(1) Non-Responsive, Industrial Hygienist, ARNG North Region IH office

(2) Non-Responsive, IH Technician (Contractor), ARNG North Region IH office

(3) Non-Responsive, Occupational Health Nurse for the DEARNG.

c. Risk Assessment Codes (RACs). RACs are assigned to recommendations to help quantify risks to personnel and to aid in the establishment of funding priorities for corrective actions. Health RACs are determined by using the RAC table from the Department of Defense Instruction (DODI) 6055.1 (reference 2). This table is provided in Appendix B of this report.

4. METHODOLOGY.

a. Assessment Criteria.

(1) The United States Army, through DODI 6055.1, Section E3.4.1.2, directs that facilities provide healthful work environments in accordance with the most stringent standards applicable (reference 2).

(2) The Occupational Safety and Health Administration (OSHA), through the Code of Federal Regulations, have enforceable regulatory standards for workplace safety (reference 3).

(3) Department of the Army Pamphlet (DA PAM) 40-503, Industrial Hygiene Program, section 1-8, states that Army occupational exposure criteria will be based on the more stringent of standards published by OSHA as Permissible Exposure Limits (PELs), guidance from the American Conference of Governmental Industrial Hygienists (ACGIH) as Threshold Limit Values (TLVs), military unique standards or published guidance from other organizations when the primary standards are not applicable (references 4 and 5).

(4) In areas containing former IFRs, NG PAM 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, is used to determine satisfactory levels of any lead present in dust (reference 1).

(5) In areas not part of a former IFR (e.g. the drill hall adjacent to the former IFR), Department of Defense (DoD) Directive-Type Memorandum (DTM) 12-003, Control and Management of Surface Accumulations from Lead, Hexavalent Chromium, an Cadmium Operations, requires that surfaces are maintained as free as practicable of accumulations of lead (reference 6).

(6) When children are present, we refer to Title 24 of the Code of Federal Regulations, Part 35.1320, Lead-based paint inspections, paint testing, risk assessments, lead-hazard screens, and reevaluations (reference 7). This Housing and Urban Development (HUD) regulation lists a clearance level, specific to floors, of 40 $\mu g/ft^2$, in the table in section 35.1320(b)(2) and is used to determine if the dwelling unit, worksite or common area passes or fails the clearance test.

b. Wipe Sampling Protocol.

(1) Procedures. Surface wipe sampling methods were conducted in accordance with NG PAM 420-15 and OSHA's Technical Manual, 5th edition (references 1 and 8).

(2) Media. Ghost Wipes were used for sample collection and were placed in 68mL HotBlock digestion vessels. Templates (10 cm x 10 cm) were used to ensure uniform wipe area.

(3) Lab Analysis. All samples were sent to Aerosol Monitoring & Analysis (AMA) Analytical Services, Inc., an American Industrial Hygiene Association (AIHA) accredited

laboratory in Lanham, Maryland. The samples were analyzed using the Environmental Protection Agency (EPA) method 600/R-93/200(M)-7000B for Lead (reference 9) (see Appendix E).

5. FINDINGS AND DISCUSSION.

a. General Information. Prior to this visit, the contractor reported the former IFR was cleaned and all samples were below the 200 $\mu g/ft^2$ limit. The bullet trap, plenum components, soundproofing, and firing points were removed. Parts of the soundproofing material and some of the adhesive mastic was still on the walls at the time of this survey. Lockers were also present in the former IFR.

b. Wipe Sampling. Surface wipe samples were collected in accordance with the guidance provided in NG Pam 420-15. Sample information is presented in Appendices C and D of this report.

c. Results. Out of 18 samples collected, 10 tested positive for lead. Nine of these 10 were reported above 200 $\mu g/ft^2$, with 3 of those 9 above 1,000 $\mu g/ft^2$. Complete surface wipe sample results are provided in Appendix C of this report.

6. CONCLUSION. The floor in the former range area, trap wall, right and left walls near the former trap (including vertical beam along left wall), and the roll door in the Scannell Readiness Center's former IFR are still contaminated with lead and need to be cleaned again. Also, the soundproofing and mastic should be completely removed from the walls prior to encapsulation.

7. RECOMMENDATIONS.

a. Decontamination Requirements. Re-clean the floor areas, walls and roll door in accordance with guidance in NG Pam 420-15. (**RAC 3**) (NG Pam 420-15, reference 1)

b. Soundproofing/Mastic Removal. Remove all soundproofing and mastic from the walls prior to any encapsulation efforts. (**RAC 4**) (NG Pam 420-15, reference 1)

c. Additional Sampling. Collect more wipe samples once the re-cleaning is completed. (**RAC 4**) (NG Pam 420-15, reference 1)

d. Limited Access. Continue to limit access to the former IFR area to personnel involved in the decontamination/conversion operation. (**RAC 4**) (NG PAM 420-15, reference 1)

e. Encapsulation. When re-sampling verifies that lead levels are below 200 µg/ft2, coat the walls will a sealant to encapsulate any remaining lead dust. Seal the concrete floors with deck enamel and then tile or cover with linoleum. (**RAC 4**) (NG PAM 420-15, reference 1)

ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Scannell Readiness Center, Delaware City, DE, 26 June 2013

8. ADDITIONAL ASSISTANCE. I am point of contact for this information and can be reached by phone at Non-Responsive or email at Non-Responsive

[redacted] Non-Responsive [redacted]
[redacted]
Regional Industrial Hygienist

APPENDIX – A
REFERENCES

1. National Guard Pamphlet (NG PAM) 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 November 2006.

2. Department of Defense Instruction (DODI) 6055.1, Department of Defense (DOD) Safety and Occupational Health (SOH) Program, 19 August 1998.

3. Title 29 Code of Federal Regulations, Part 1910.1025, Lead, Occupational Safety and Health Administration (OSHA), 2013 Edition.

4. Department of the Army Pamphlet (DA PAM) 40-503, The Army Industrial Hygiene Program, 2 April 2013.

5. Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, 2013, American Conference of Governmental Industrial Hygienists, Cincinnati, OH.

6. Department of Defense (DoD) Directive-Type Memorandum (DTM) 12-003, Control and Management of Surface Accumulations from Lead, Hexavalent Chromium, and Cadmium Operations, 18 April 2012.

7. Title 24 Code of Federal Regulations, Part 35.1320, Lead-based paint inspections, paint testing, risk assessments, lead-hazard screens, and reevaluations, Housing and Urban Development (HUD), 2013 Edition.

8. Occupational Safety and Health Administration Technical Manual, TED 01-00-015 [TED 1-0.15A], 5th Edition.

9. Environmental Protection Agency (EPA) Method 600/R-93/200(M), Field Analysis of Lead in Paint, Bulk Dust, and Soil by Ultrasonic, Acid Digestion and Colorimetric Measurement, September 1993.

APPENDIX – B
DERIVING RISK ASSESSMENT CODES (RACs) FOR HEALTH HAZARDS

(Taken from Table 2 of DODI 6055.1 (reference 2))

1. HEALTH HAZARD SEVERITY CODE (HHSC). Using the following procedures to assess points, 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

AER Possible?	Exposure Conditions			
	<AL	Occasionally>AL Always<OEL	>AL <=OEL	>OEL
NO	0	3	5	7
YES	1-2	4	6	8

AER = Alternate exposure route, such as skin absorption, ingestion.
AL = Action level, DoD component threshold that triggers surveillance actions, such as microWatts/cm^2, dB, parts per million.
OEL = Occupational Exposure Limit, DoD exposure limit, such as Threshold Limit Value and Permissible Exposure Limit.

b. Medical Effects Points Assessed.

Condition	Points
No medical effect, 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, non-severe illness or loss of capacity, such as permanent hearing loss	5-6
Permanent, severe, disabling irreversible illness or death, such as asbestosis and lung cancer	7-8

APPENDIX – B – CONTINUED
DERIVING RISK ASSESSMENT CODES (RACs) FOR HEALTH HAZARDS

c. Determine the HHSC by totaling the points assessed and using the following guide:

Total Points (sum of A and B, above)	HHSC
13-16	I
9-12	II
5-8	III
0-4	IV

2. ILLNESS PROBABILITY CODE (IPC). Using the following guides to assess points, determine the IPC for health hazards. The IPC is a function of the duration of exposure and the number of exposed personnel.

a. Duration of Exposure Points Assessed

Type of Exposure	Exposure Duration		
	1-8 hr/wk	>8hr/wk, not continuous	Continuous
Irregular, intermittent	1-2	4-6	-
Regular, periodic	2-3	5-7	8

b. Number of Exposed Personnel Points Assessed

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

APPENDIX – B – CONTINUED
DERIVING RISK ASSESSMENT CODES (RACs) FOR HEALTH HAZARDS

c. Determine the IPC for health hazards by totaling the points assessed and using the following guide:

Total Points (sum of A and B, above)	IPC
14-16	A
10-13	B
5-9	C
<5	D

3. Determine the RAC for health hazards by using the following matrix to measure health hazard severity and mishap probability factors.

HEALTH HAZARD SEVERITY CODE	ILLNESS PROBABILITY CODE			
	A	B	C	D
I	1	1	2	3
II	1	2	3	4
III	2	3	4	5
IV	3	4	5	5

4. RAC DESCRIPTOR

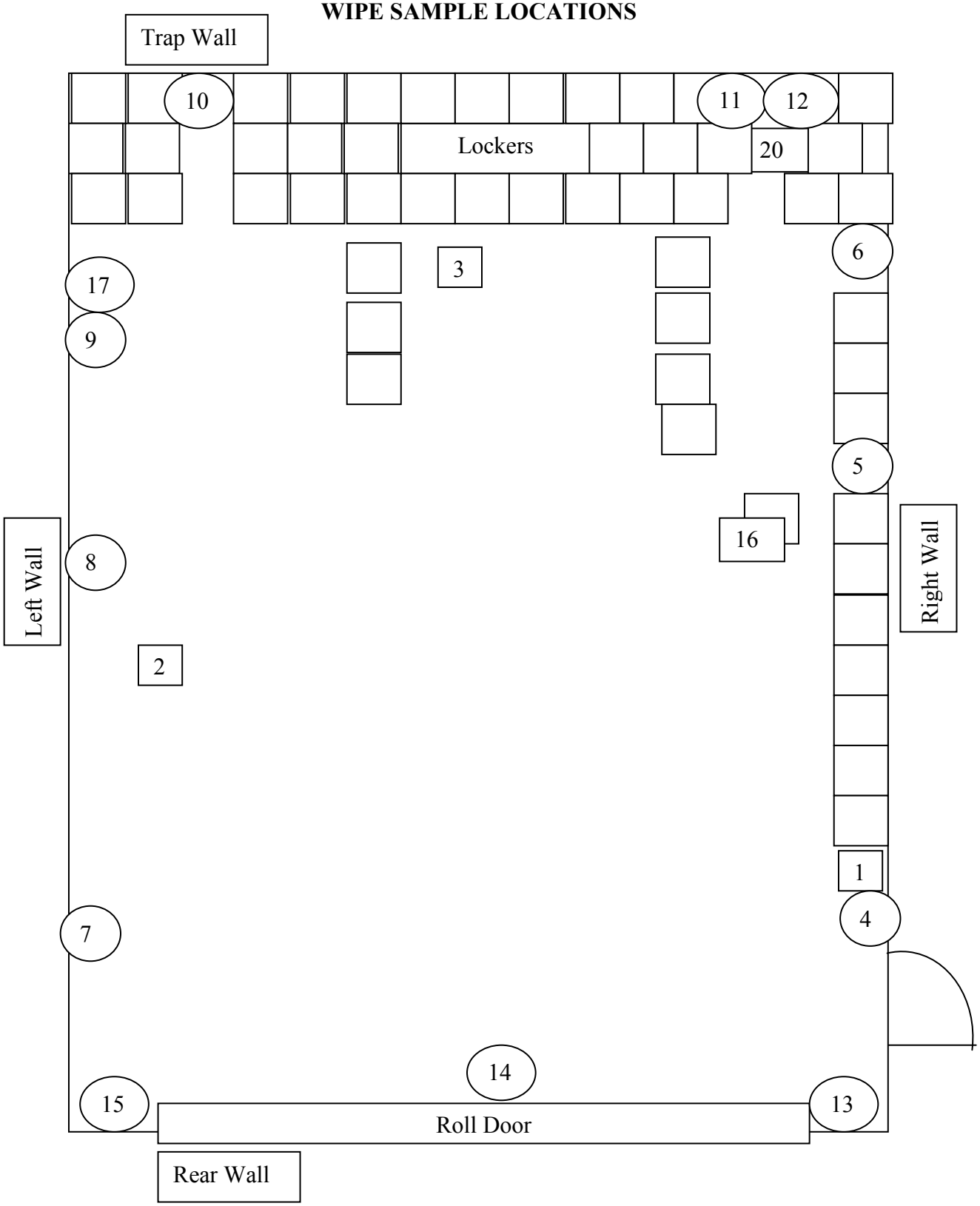
RAC	DESCRIPTOR
1	CRITICAL
2	SERIOUS
3	MODERATE
4	MINOR
5	NEGLIGIBLE

ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Scannell Readiness Center, Delaware City, DE, 26 June 2013

APPENDIX – C
WIPE SAMPLE INFORMATION

				Distance From Wall:				
Sample Number	Result		Location	Trap	Rear	Left	Right	Vertical Position:
20130626 Scannell DE 01	< 110	µg/ft^2	Floor		10 ft		6 in	
20130626 Scannell DE 02	350	µg/ft^2	Floor		32 ft	2 ft		
20130626 Scannell DE 03	280	µg/ft^2	Floor	9 ft			10 ft	
20130626 Scannell DE 04	< 110	µg/ft^2	Wall, Right		6 ft			6 ft from floor
20130626 Scannell DE 05	< 110	µg/ft^2	Wall, Right		50 ft			3 ft from floor
20130626 Scannell DE 06	1,000	µg/ft^2	Wall, Right	9 ft				1 ft from floor
20130626 Scannell DE 07	< 110	µg/ft^2	Wall, Left		8 ft			6 ft from floor
20130626 Scannell DE 08	< 110	µg/ft^2	Wall, Left		25 ft			3 ft from floor
20130626 Scannell DE 09	240	µg/ft^2	Wall, Left	21 ft				1 ft from floor
20130626 Scannell DE 10	140	µg/ft^2	Wall, Trap			4 ft		3 ft from floor
20130626 Scannell DE 11	31,000	µg/ft^2	Wall, Trap				3 ft	6 ft from floor
20130626 Scannell DE 12	230	µg/ft^2	Wall, Trap				3 ft	1 ft from floor
20130626 Scannell DE 13	< 110	µg/ft^2	Wall, Rear				6 in	6 ft from floor
20130626 Scannell DE 14	300	µg/ft^2	Wall, Rear				10 ft	4 ft from floor
20130626 Scannell DE 15	< 110	µg/ft^2	Wall, Rear			1 ft		1 ft from floor
20130626 Scannell DE 16	< 110	µg/ft^2	Locker Top	Locker tag: SPC Sandoval, B				
20130626 Scannell DE 17	1,000	µg/ft^2	Vertical Beam	Beam on Left Wall, 24 feet from Trap Wall / 4 feet from floor on the Rear Wall side of Beam				
20130626 Scannell DE 20	800	µg/ft^2	Floor	3 feet from Right Wall / 1 foot from Trap Wall, on floor under lockers				
20130626 Scannell DE 18	< 12	µg	BLANK					
20130626 Scannell DE 19	< 12	µg	BLANK					

APPENDIX – D
WIPE SAMPLE LOCATIONS



ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Scannell Readiness Center, Delaware City, DE, 26 June 2013

APPENDIX – E
LABORATORY RESULTS

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

AIHA LAP, LLC ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	Delaware IFR Lead Clearance	**Chain Of Custody:**	516215
Address:	301-JH Old Bay Lane, Attn: ARNG-CSG-P, State Military Reservation	**Job Location:**	Scannell Armory, DE	**Date Submitted:**	6/28/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	7/3/2013
Attention:	[redacted]				**Report Date:** 7/3/2013

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
13074379	20130626 Scannell DE 01	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13074380	20130626 Scannell DE 02	Flame	Wipe	****	0.111	110	ug/ft²	39	350	ug/ft²	
13074381	20130626 Scannell DE 03	Flame	Wipe	****	0.111	110	ug/ft²	31	280	ug/ft²	
13074382	20130626 Scannell DE 04	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13074383	20130626 Scannell DE 05	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13074384	20130626 Scannell DE 06	Flame	Wipe	****	0.111	110	ug/ft²	110	1000	ug/ft²	
13074385	20130626 Scannell DE 07	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13074386	20130626 Scannell DE 08	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13074387	20130626 Scannell DE 09	Flame	Wipe	****	0.111	110	ug/ft²	26	240	ug/ft²	
13074388	20130626 Scannell DE 10	Flame	Wipe	****	0.111	110	ug/ft²	16	140	ug/ft²	
13074389	20130626 Scannell DE 11	Flame	Wipe	****	0.111	110	ug/ft²	350	3100	ug/ft²	

An AIHA (#100470) and NY ELAP (#10920) Accredited Laboratory
4475 Forbes Blvd. · Lanham, MD, 20706 · (301) 459-2640 · Toll Free (800) 346-0961 · Fax (301) 459-2643

APPENDIX – E – CONTINUED
LABORATORY RESULTS

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

AIHA LAP, LLC ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAP, LLC #100470

CERTIFICATE OF ANALYSIS

Client: National Guard Bureau
Address: 301-JFI Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation
Havre de Grace, Maryland 21078
Attention: [redacted]

Job Name: Delaware IFR Lead Clearance
Job Location: Scannell Armory, DE
Job Number: Not Provided
P.O. Number: W912K6-09-A-0003

Chain Of Custody: 516215
Date Submitted: 6/28/2013
Person Submitting: [redacted]
Date Analyzed: 7/3/2013
Report Date: 7/3/2013

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
13074390	20130626 Scannell DE 12	Flame	Wipe	****	0.111	110	ug/ft²	25	230	ug/ft²	
13074391	20130626 Scannell DE 13	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13074392	20130626 Scannell DE 14	Flame	Wipe	****	0.111	110	ug/ft²	33	300	ug/ft²	
13074393	20130626 Scannell DE 15	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13074394	20130626 Scannell DE 16	Flame	Wipe	****	0.111	110	ug/ft²	<12	<110	ug/ft²	
13074395	20130626 Scannell DE 17	Flame	Wipe	****	0.111	110	ug/ft²	110	1000	ug/ft²	
13074396	20130626 Scannell DE 18	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	
13074397	20130626 Scannell DE 19	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	
13074398	20130626 Scannell DE 20	Flame	Wipe	****	0.111	110	ug/ft²	89	800	ug/ft²	

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4475 Forbes Blvd. · Lanham, MD. 20706 · (301) 459-2640 · Toll Free (800) 346-0961 · Fax (301) 459-2643

ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Scannell Readiness Center, Delaware City, DE, 26 June 2013

APPENDIX – E – CONTINUED
LABORATORY RESULTS

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

AIHA LAP, LLC ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAP #100470

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	Delaware IFR Lead Cleanee	**Chain Of Custody:**	516215
Address:	301-IH Old Bay Lane, Attn: ARNG-CIG-P, State Military Reservation	**Job Location:**	Scannell Armory, DE	**Date Submitted:**	6/28/2013
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	7/3/2013
Attention:	[redacted]				**Report Date:** 7/3/2013

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit	Total ug	Final Result	Comments
Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B							See QC Summary for analytical results of quality control samples associated with these samples.		
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B									
N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)									
%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)									
Note: All samples were received in good condition unless otherwise noted.									
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.									
Air and Wipe results are not corrected for any blank results									
Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.									
All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.									

Analyst: [redacted] Technical Manager: [redacted]

An AIHA (#100470) and NY ELAP (#10920) Accredited Laboratory
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APPENDIX – F
PHOTOGRAPHS

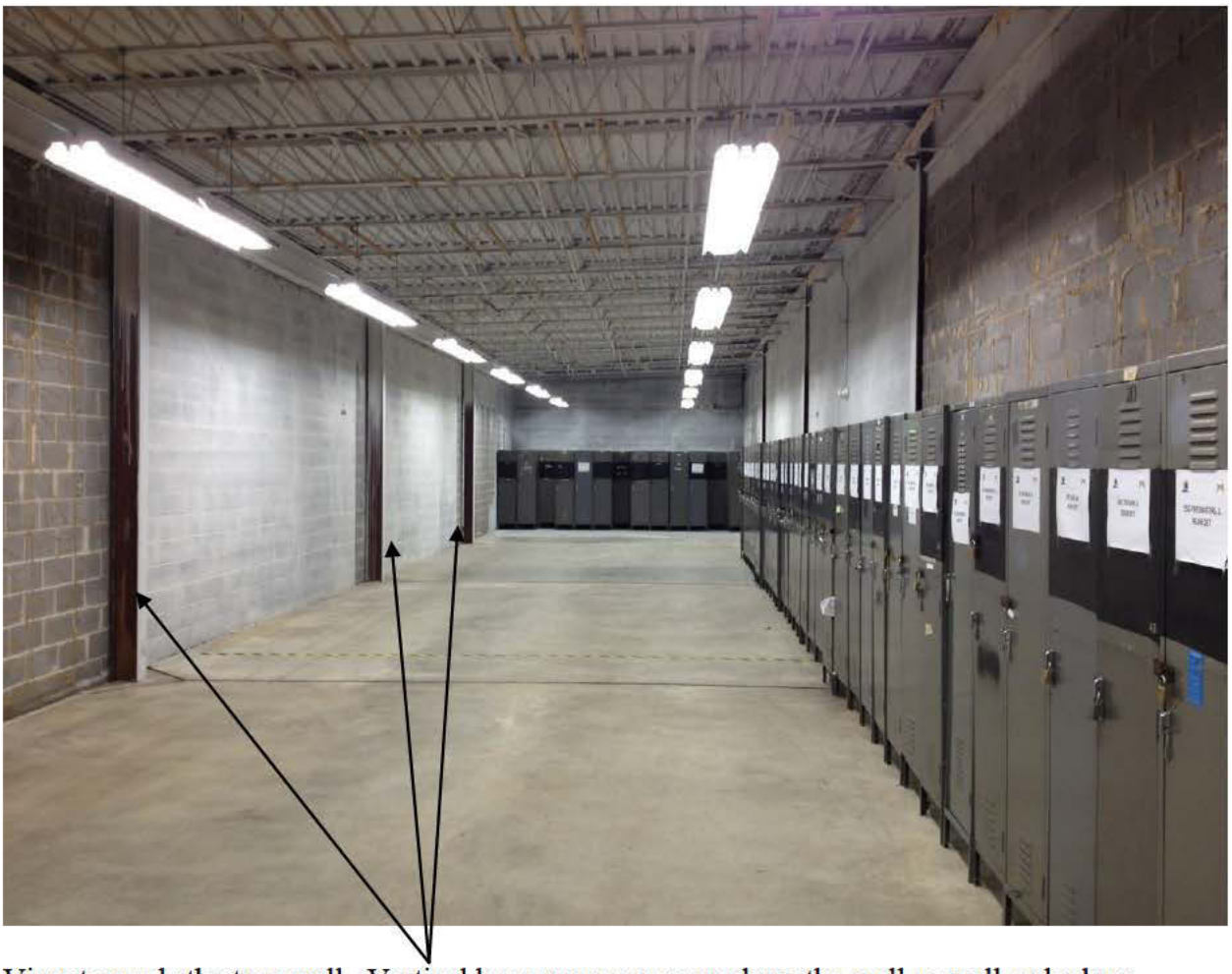
Picture 1:

View of the entry door and roll door at the rear of the former IFR.

ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Scannell Readiness Center, Delaware City, DE, 26 June 2013

APPENDIX – F – CONTINUED
PHOTOGRAPHS

Picture 2:

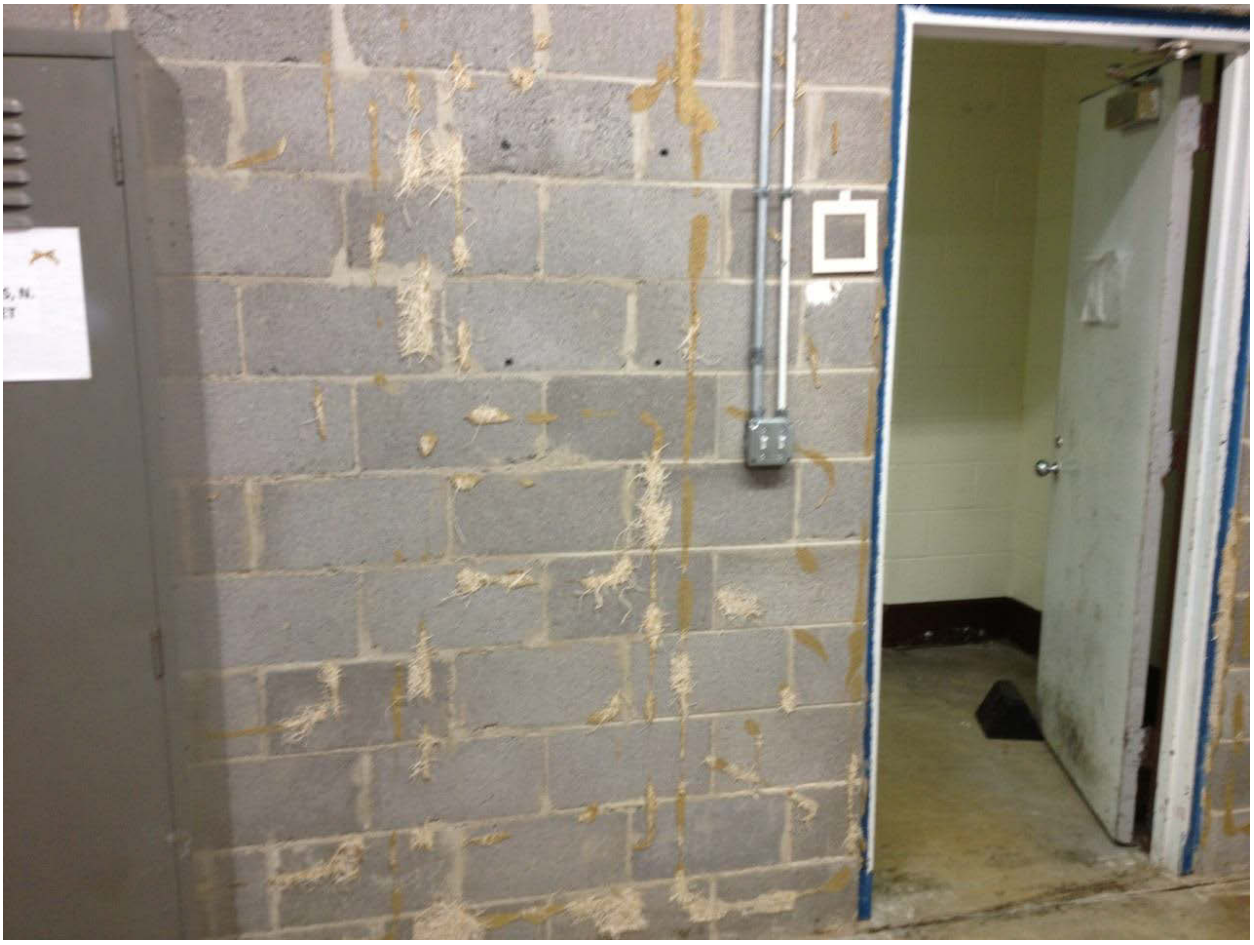


View towards the trap wall. Vertical beams can see seen along the wall as well as lockers.

ARNG-CSG-P
SUBJECT: Industrial Hygiene Former IFR Wipe Sampling Survey, Scannell Readiness Center, Delaware City, DE, 26 June 2013

APPENDIX – F – CONTINUED
PHOTOGRAPHS

Picture 3:



View of remaining soundproofing on wall.

Shaw Environmental, Inc.

312 Directors Drive
Knoxville, TN 37923
865.690.3211
Fax 865.690.3626

Shaw® Shaw Environmental, Inc.

National Guard Armory
Scannell Readiness Center - Delaware City, Delaware

Industrial Hygiene Evaluation

Prepared for:

National Guard Region North Industrial Hygiene Office
Havre De Grace, Maryland 21078

Prepared by:

Shaw Environmental. Inc.
312 Directors Drive
Knoxville, Tennessee 37923

October 24, 2003

National Guard Armory
Scannell Readiness Center - Delaware City, Delaware

Industrial Hygiene Evaluation

Prepared for:

National Guard Region North Industrial Hygiene Office
Havre De Grace, Maryland 21078

Prepared by:
Shaw Environmental, Inc.
312 Directors Drive
Knoxville, Tennessee 37923

October 24, 2003

Prepared by: Non-Responsive _____
Industrial Hygienist

Reviewed by: Non-Responsive _____
Business Line Manager

Table of Contents

List of Tables

List of Appendices

Executive Summary

Shaw Environmental, Inc. was contracted to perform an industrial hygiene evaluation for the Scannell Readiness Center in Delaware City, Delaware. Non-Responsive and Non-Responsive Non-Responsive performed the evaluation on May 30, 2003. The point of contact at the readiness center was SPC Non-Responsive

The following industrial hygiene concerns were evaluated.

- Wipe Sampling for Lead
- Air Sampling for Lead
- Peeling Paint – Lead
- Suspected Asbestos Containing Material
- Water Damage
- Presence of Mold
- Housekeeping
- Ergonomic Concerns
- Indoor Air Quality
- Safety and Industrial Hygiene Programs
- Ventilation System Evaluation
- Contamination of Clean Air Sources
- Noise
- Lighting
- Converted Indoor Firing Ranges
- HVAC Systems

The following items were either not applicable to the armory or the evaluation resulted in a conclusion that there were no industrial hygiene concerns.

- Air Sampling for Lead
- Peeling Paint – Lead
- Presence of Mold
- Housekeeping
- Indoor Air Quality
- Safety and Industrial Hygiene Programs

- Ventilation System Evaluation
- Contamination of Clean Air Sources
- Noise
- Converted Indoor Firing Ranges
- HVAC Systems

Areas where there were industrial hygiene concerns are as follows:

- Wipe sampling for lead revealed a concentration at the recommended level on the fan in the assembly hall. It is recommended that the fan, and the immediate area around the fan, be thoroughly cleaned to reduce the lead level. In addition, any other dusty/dirty areas in the assembly area/drill floor should be thoroughly cleaned.
- If a special function is held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function since there were concentrations of lead in the assembly hall/drill floor that that exceeded the recommended level.
- Materials suspected of containing asbestos were observed. An operations and maintenance plan should be followed when performing any activities that may disturb the suspected asbestos-containing materials.
- Water damage was observed at several locations at the armory. The source of the water damage should be identified and actions taken to eliminate the source in order to prevent the possibility of mold growth that may lead to indoor air quality problems.
- Interviews with office employees revealed that there are ergonomic concerns at the armory. The office workstations should be further evaluated to determine if they could be modified in order to improve working conditions.
- Lighting measurements were conducted at the armory. The lighting did not meet the minimum requirements in many of the areas evaluated, therefore, consideration should be given to providing more lighting to these areas.

1.0 Introduction

Shaw Environmental, Inc. was contracted to perform an industrial hygiene evaluation for the Scannell Readiness Center in Delaware City, Delaware. Non-Responsive and Non-Responsive performed the evaluation on 30 May 2003. The point of contact at the readiness center was SPC Non-Responsive.

The findings, discussion, and interpretation of results are provided in Section 2.0. The conclusions are provided in Section 3.0. The HHIM data forms for the facility are provided in Appendix A. The building layout is provided in Appendix B. Sampling sheets and laboratory analyses are provided in Appendix C. References are provided in Appendix D. The *Recommendations for Surface Lead Dust in Armories* document is provided in Appendix E.

The statements, opinions, and conclusions contained in this report are based solely upon the services performed by Shaw as described in the report. In performing these services and preparing the report, Shaw Environmental, Inc. relied upon the work and information provided by others, including public agencies, whose information is not guaranteed by Shaw Environmental, Inc.

2.0 Findings, Discussion, and Interpretation of Results

The results, discussion, and interpretation of results are provided in the following sections.

2.1. Sampling for Lead

2.1.1 Wipe Sampling

Wipe samples were collected for lead from the drill floor. Also, wipe samples were collected for lead in rooms, hallways, foyers, etc. The sampling in rooms, hallways, foyers, etc represented approximately 25% of the building. Approximately half of the samples were collected from surfaces in common areas, such as surfaces of a desk. The remaining samples were collected from uncommon surface areas, such as a supply vent or the top of a file cabinet. The samples were collected and analyzed in accordance with the Instructions for *Completing the Sampling of ARMY National Guard Armories* procedure.

Results of the wipe sampling are provided in Table 1. The results revealed lead at all locations sampled at concentrations below the recommended level of 200 micrograms lead per square foot ($\mu g/ft^2$) (see Appendix E) except in one location. The lead concentration on the fan in the assembly hall had a lead concentration of 200 $\mu g/ft^2$. Since the lead concentration on the fan was at the permissible level, it is recommended that the fan, and the immediate area around the fan, be thoroughly cleaned to reduce the lead level. In addition, any other dusty/dirty areas in the assembly area/drill floor should be thoroughly cleaned.

Please note that the *Recommendations for Surface Lead Dust in Armories* (Appendix E) states that all areas should be cleaned that will be accessible to children if lead concentrations exceed 40 $\mu g/ft^2$. If a special function is held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function since there were concentrations of lead in the assembly hall/drill floor that exceeded 40 $\mu g/ft^2$.

2.1.2 Air Sampling

Breathing zone air sampling was conducted on two (2) full-time building occupants. (Please note that no State employees were monitored.). The samples were collected and analyzed in accordance with Method 7300 of the National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods.

The results of the sampling are provided in Table 2. The results revealed non-detectable concentrations of lead in the breathing zone of the employees therefore, no actions are necessary.

2.2 Physical Condition of Facility

2.2.1 Peeling Paint - Lead

Peeling paint was not observed at the armory, therefore, bulk samples for lead in paint were not taken.

2.2.2 Visual Inspection - Asbestos

A visual inspection was made to determine if there was any suspected asbestos-containing material at the armory. Materials suspected of containing asbestos were observed. The suspected asbestos-containing materials, with condition and estimated quantity, were at the following locations:

- Pipe in 2nd Floor Classroom; poor condition because it is deteriorated at joint; approximately 2-3 linear feet
- Pipes in Boiler Room; good condition; less than 100 linear feet

An operations and maintenance plan should be followed when performing any activities that may disturb the suspected asbestos-containing materials.

2.2.3 Visual Inspection – Water Damage and Mold

A visual inspection was made to determine if there was any water damage or visible mold at the armory. Visible mold was not observed, however, water damage was observed at the following locations:

- Main Floor - SGT [redacted] Non-Responsive 's Office
- Main Floor Lobby (Multiple Locations)

- Drill Floor
- 2nd Floor Commander's Office
- 2nd Floor – SPC [redacted] s Office Area
- 2nd Floor Corridor by the Copier

The source of the water damage was likely from roof leaks. However, the source of the water damage should be identified and actions taken to eliminate the source in order to prevent the possibility of mold growth that may lead to indoor air quality problems.

2.2.4 Visual Inspection - Housekeeping

The housekeeping was determined to be good.

2.3. Building Concerns

2.3.1 Ergonomic Concerns

Interviews with employees revealed that there are ergonomic concerns at the armory. Two (2) office employees performing word processing functions stated that they suffered from pain in the wrists. These workstations should be further evaluated to determine if they could be modified in order to improve working conditions.

2.3.2 Indoor Air Quality

Interviews with employees and measurements for carbon dioxide, humidity, and temperature revealed no indoor air quality concerns at the armory.

The results of the measurements for carbon dioxide, humidity, and temperature are provided in Table 4.

2.4. Safety and Industrial Hygiene Programs

An evaluation was performed to determine the applicability of the following programs.

- Confined Spaces
- Hearing Conservation
- Respiratory Protection
- Hazard Communication (HAZCOM)

BEST AVAILABLE COPY

- Personal Protective Equipment (PPE)

It was determined that none of the programs were applicable at the armory.

2.5. Ventilation

2.5.1 Ventilation System Evaluation

There were no local exhaust ventilation systems at this armory; therefore, no ventilation studies were performed.

2.5.2 Contamination of Clean Air Sources

Since there were no local exhaust ventilation systems at the armory, there was no possibility that clean air sources could be contaminated by exhaust air.

2.6. Noise Dosimetry

An evaluation was performed to determine if there were any hazardous noise areas at the armory. It was determined that there were no areas at the armory that would exceed the permissible exposure limit for noise.

2. 7 Lighting

Lighting measurements were conducted at the armory. Results of the lighting evaluation are provided in Table 5. As can be seen from the results, the lighting did not meet the minimum requirements in many of the areas evaluated. Examples include the bathrooms, stairwells, locker room, and classrooms.

Consideration should be given to providing more lighting to these areas of the armory. This may be accomplished by replacing burnt out luminaries, cleaning fixtures, cleaning windows, painting walls with a lighter color, repositioning detailed work to higher illuminated areas, and using supplemental lighting.

2. 8. Converted Indoor Firing Ranges

There was a converted indoor firing range at the facility, therefore, wipe samples were taken for lead at various locations in or near the range. The samples were taken and analyzed in accordance with the Instructions for *Completing the Sampling of ARMY National Guard Armories* procedure.

Results of the wipe sampling are provided in Table 5. The results revealed lead at two locations on the floor, with levels of 45 and 50 $\mu g/ft^2$. Since the lead levels are below the recommended level of 200 $\mu g/ft^2$, a level recommended in the *Guidelines for Converting Indoor Firing Ranges to Other Uses* document (Department of Army), no actions are necessary.

2.9. HVAC System

There was not a HVAC system at the armory.

2.10. HHIM

A Health Hazard Information Module (HHIM) form was completed for the armory. The completed form is provided in Appendix A.

3.0 Conclusions

It is concluded that there were no industrial hygiene concerns at the armory with regards to atmospheric exposure to lead, peeling paint that contained lead, visible mold, housekeeping, indoor air quality, safety and industrial hygiene programs, ventilation systems or contamination of clean air sources, noise exposure, surface lead contamination in the converted firing range, and the maintenance and cleanliness of the HVAC system.

There were industrial hygiene concerns at the armory with regards to suspected lead surface contamination, asbestos-containing material, water damage, ergonomic conditions, and lighting. These concerns are discussed in detail in Section 2.0 of this report.

TABLES

Table 1

Wipe Sampling for Lead

National Guard Armory

Delaware City, Delaware

Date of Sampling: 30 May 2003 and 3 October 2003

Sample Number	Location	Results, $\mu g/ft^2$ [a]
DEDEL150-1	Assembly Hall – On Floor	< 23
DEDEL150-2	Assembly Hall – On Floor	<23
DEDEL150-3	Assembly Hall – On Floor	97
DEDEL150-4	Assembly Hall – On Floor	27
DEDEL150-5	Assembly Hall – On Floor	41
DEDEL276-1	Kitchen Near Assembly Hall – Top of Refrigerator	9
DEDEL276-2	Assembly Hall – Top of Locker	17
DEDEL276-3	Assembly Hall – On Fan	200
DEDEL276-4	Assembly Hall – On Vending Machine	33
DEDEL276-5	SGT Office – Heating Air Grill	11
DEDEL150-12	2nd Floor – SPC Non-Responsive Office – Air-Conditioning Unit	< 23
DEDEL150-13	2nd Floor – On Top of Locker 13 in Locker Room	< 23
DEDEL150-14	2nd Floor – Table Top in Classroom	< 23
DEDEL150-15	Main Floor –Boiler Room	142
DEDEL150-18	Main Floor – Desk in SGT Non-Responsive Office	< 23
DEDEL150-16	Field Blank	< 23
DEDEL150-17	Field Blank	< 23
DEDEL276-6	Field Blank	0.76 µg

[a] Micrograms lead per square foot

The samples were taken and analyzed in accordance with the Instructions for *Completing the Sampling of ARMY National Guard Armories* procedure.

Table 2

Breathing Zone Air Samples for Lead

National Guard Armory

Delaware City, Delaware

Date of Sampling: 30 May 2003

Sample Number	Employee	Sampling Information			Results (mg/m^3) [a]
		Time Sampled / Minutes	Flow Rate (lpm) [b]	Volume (liters)	
DEDEL150-A1	Non-Responsive	1050-1432 / 222	2.419	536.91	< 0.002
DEDDE150-A2		1245-1430 / 90	2.431	218.75	< 0.005
DEDEL150-A3	Field Blank	-	-	-	None Detected

[a] Milligrams lead per cubic centimeter of air.
[b] Liters of air per minute.

Method 7082 of the National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods was followed for sampling for lead.

Table 3
Indoor Air Quality Measurements for Carbon Dioxide, Humidity, and Temperature
National Guard Armory
Delaware City, Delaware
Date of Sampling: 30 May 2003

Location	Occupants in Area	Carbon Dioxide, parts per million parts of air (ppm)	Percent (%) Humidity	Temperature (°F)
Main Floor –Main Entrance	2	360	55.5	73.9
2nd Floor – Administrative Office Area	4	395	57.9	75.0
Outdoors	-	345	56.2	75.9

Carbon dioxide, humidity, and temperature measurements were taken with a TSI Q Trak Plus, Model 8554, Indoor Air Quality Meter, calibrated in April 2003.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommends that indoor carbon dioxide levels be less than 700 ppm above outdoor levels.

ASHRAE recommends that the relative humidity levels be maintained between 30 to 60 percent.

ASHRAE recommends that the acceptable temperature range be 68 degrees Fahrenheit to 74 degrees Fahrenheit in the winter and 73 degrees Fahrenheit to 79 degrees Fahrenheit in the summer.

Table 4
Illumination Readings
National Guard Armory
Delaware City, Delaware
Date of Sampling: 30 May 2003

Location	Luminance (fc)[a]	Standard (fc)[a]	Standard Met
Drill Floor	88-190	70	Yes
Main Floor - Storage Area/Firing Range	1-5	30	No
Main Floor - Workout Area/Firing Range	15-51	70	No
Main Floor – Women's Bathroom	24-32	40	No
Main Floor – Men's Bathroom	28-32	40	No
Main Floor - Corridor	20	7.5	Yes
North Stairwell	1.5-4	7.5	No
2nd Floor – Administrative Office Area	82-92	70	Yes
2nd Floor - Locker Room	12-42	70	No
2nd Floor – Classroom	7-27	70	No
2nd Floor – Corridor	5-36	7.5	Some Areas
2nd Floor – Commander's Office	111	70	Yes
2nd Floor – Men's Bathroom	20	40	No
2nd Floor - Classroom	47-61	70	No
South Stairwell	2-5	7.5	No

[a] fc - Footcandles

The readings were taken with a Cooke Corporation cal-LIGHT 400 Calibrated Precision Lightmeter, calibrated on 19 Aug 2002.

The standards listed above are from Design Guide DG-415-2, Logistics Facilities, published by the National Guard Bureau Installation Division.

Table 5

Wipe Sampling for Lead – Converted Firing Range

National Guard Armory

Delaware City, Delaware

Date of Sampling: 30 May 2003

Sample Number	Location	Results, $\mu g/ft^2$ [a]
DEDEL150-6	Floor	45
DEDEL150-7	Light Fixture	BDL [b]
DEDEL150-8	Top of Ductwork on HVAC System	BDL
DEDEL150-9	Stored Item in Range	50
DEDEL150-10	Floor	BDL
DEDEL150-11	Floor Outside the Range	BDL
DEDEL150-16	Field Blank	BDL
DEDEL150-17	Field Blank	BDL

[a] Micrograms lead per square foot
[b] Below Detectable Limits, at a detection level of 23 $\mu g/ft^2$

The samples were taken and analyzed in accordance with the Instructions for *Completing the Sampling of ARMY National Guard Armories* procedure.

Appendix A
HHIM Data Form

HEALTH HAZARD INFORMATION MODULE: INDUSTRIAL HYGIENE SURVEY

(For use of this form, see HHIM User's Guide)

SECTION 1. DEMOGRAPHIC DATA

ARLOC	INSTALLATION	BLDG/RM NO.
42394	RC, Scannell	Delaware City

LOCATION/CODE	OPERATION/CODE
Administrative Areas/AA	Administrative Operations/ADO

SURVEY DATE	EVALUATOR (Initials)
30 May 03	AG

MACOM/CODE	SUBMACOM/CODE	SUPERVISOR
7A	XX	SFC Non-Responsive

TELEPHONE/DSN NO.	UNIT/ORGANIZATION	RAC	FREQUENCY (hrs/day)
(302) 326-7390	National Guard	5	8

NO. CIV(S)	NO. MIL	NO. CONTRACTOR(S)	NO. LOC(S)	NO. OTHER
	4			

SECTION 2. FACILITY DATA

LAB HOODS	VAPOR DEGREASERS	SPRAY BOOTHS
0	0	0

MAINTENANCE BAYS	OPEN SURFACE TANKS	VENTILATION UNITS
0	0	0

SECTION 3. SURVEY DATA

CONTROLS PRESENT	EVALUATION	UNIT CODE	CONTROLS REQUIRED	STATUS

PERSONAL PROTECTIVE EQUIPMENT (R = Required; U = Utilized)

GLOVES	R/U	RESPIRATOR	NIOSH TC NO.	MANUFACTURER	R/U
ACID	/	AIRLINE			/
COLD SURFACES	/	ABRASIVE BLASTING HOOD			/
HOT SURFACES	/	DISPOSABLE			/
NBC AGENTS	/	FULL FACE AIR PURIFYING			/
OIL	/	1/2 FACE AIR PURIFYING			/
SOLVENTS	/	POWERED AIR PURIFYING			/
SURGICAL GLOVES	/	1/4 FACE AIR PURIFYING			/
		SELF CONTAINED			/

EYES/FACE	R/U	HEARING	R/U	BODY	R/U	HEAD/FIT	R/U
CHEMICAL SPLASH	/	CANAL CAPS	/	APRONS	/	COLD WEATHER BOOTS/HATS	/
FULL FACE SHIELD	/	EARPLUGS	/	COLD WEATHER CLOTHING	/	HARD HATS	/
CHEMICAL/SAFETY	/	HELMETS	/	COVERALLS	/	IMPERMEABLE BOOTS	/
SAFETY/IMPACT	/	MUFFS	/	FULL BODY SUIT	/	SAFETY/CONDUCTIVE SHOES	/
WELDING HELMET	/	MUFF/EARPLUG COMBO	/	HEAT REFLECTIVE VEST/SUIT	/	SAFETY/NON-CONDUCTIVE SHOES	/
		MUFF/EARPLUG W/TIME LIMIT	/	SAFETY BELT/HARNESS	/		/

Attach 4

SECTION 4. HAZARD INVENTORY DATA

CAS CODE	HAZARD DESCRIPTION	PAC	EPC
POVDTxxxx	Video Display Terminal	3	D
1332-21-4	Asbestos (Other)	2	C

SECTION 5. PERSONNEL DATA

LAST NAME	FIRST NAME	MI	SEX	SSN	CATEGORY
Non-Responsive		A	F	Non-Responsive	MIL
		P	M		MIL
		M	M		MIL
			M		MIL

SECTION 6. COMMENTS

☐ No comments ☐ See attached sheet

Survey conducted by Ms. Non-Responsive There are four full-time employees. Employees perform mainly administrative functions.

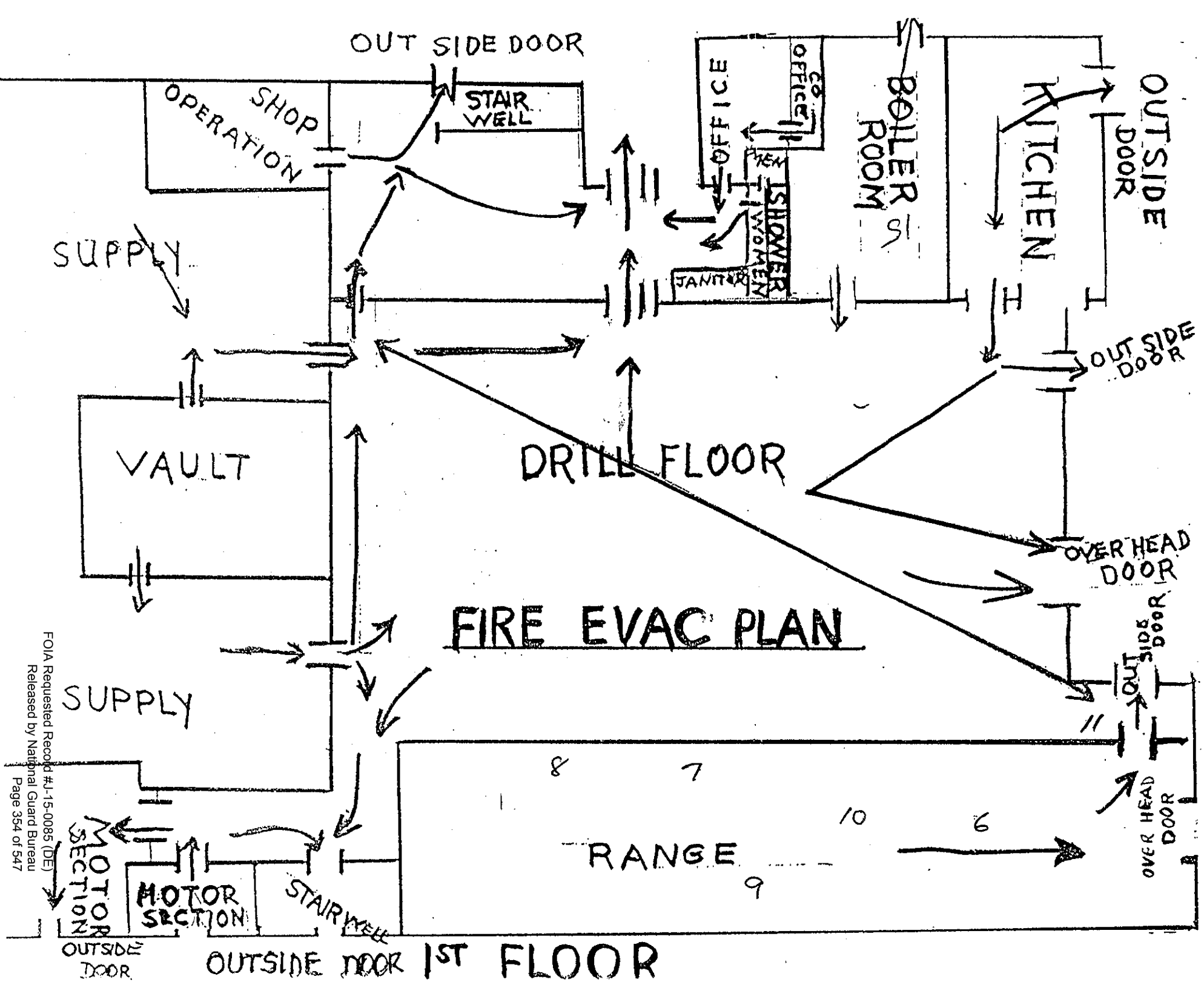
PRIVACY ACT STATEMENT

Title 5 US Code, Section 301; Executive Order 9397 authorizes the use of your Social Security Number as an identification number. The purpose of this information is to identify and monitor data relating each DA civilian and military employee exposed to a hazardous workplace or operation. The use of this information is to provide histories of exposures for any given worker.

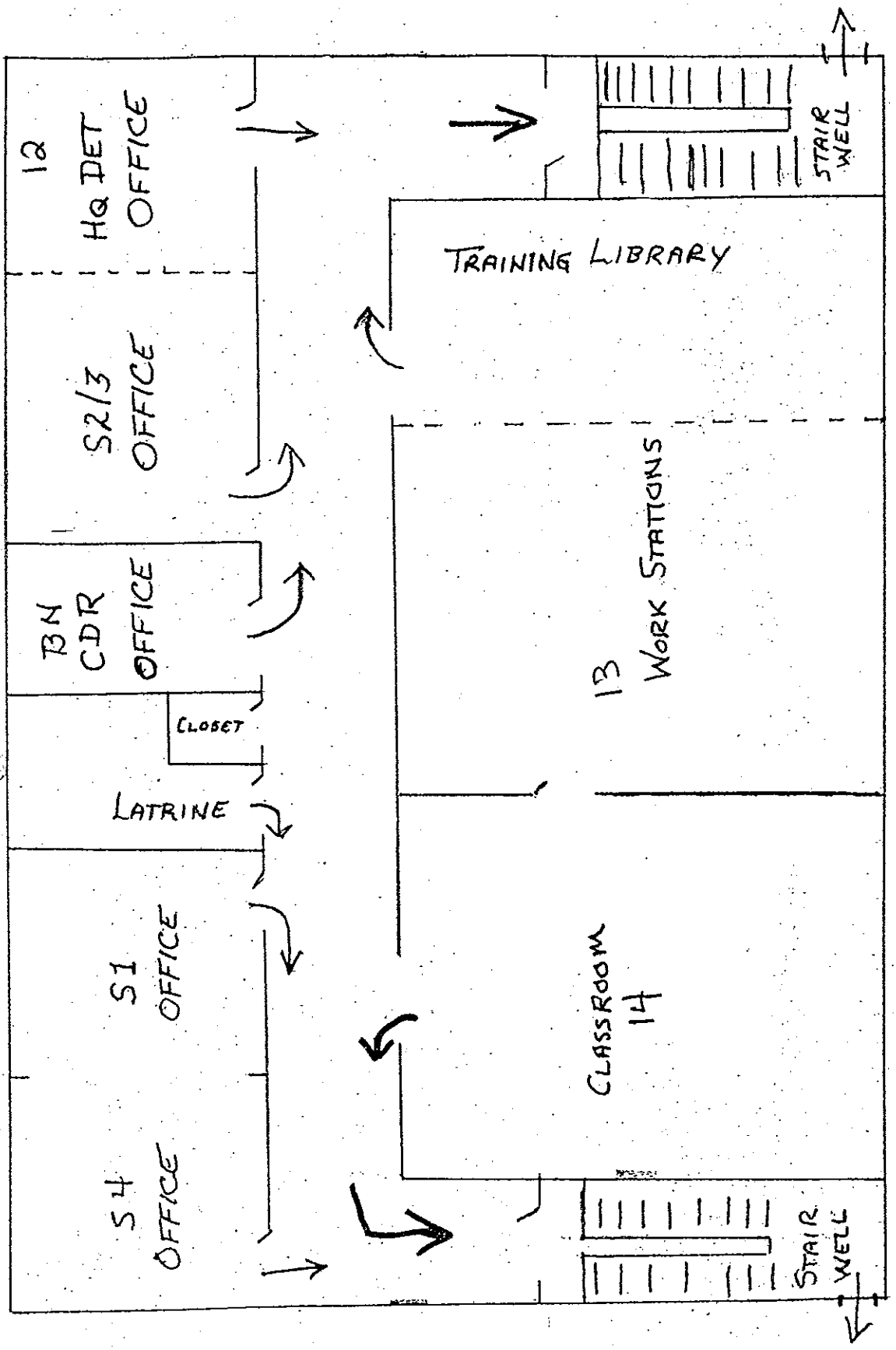
Disclosure of your Social Security Number is not mandatory; however, nondisclosures may result in untimely provision of proper medical monitoring.

Attach 4

Appendix B
Building Layout



2ND FLOOR
FIRE EVACUATION PLAN



Appendix C
Sampling Sheets and Laboratory Analyses

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Delaware National Guard Survey	**Chain Of Custody:**	118600
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Delaware City	**Date Analyzed:**	10/15/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	1002	**Report Date:**	15-Oct-03

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0401629	DEDEL276-1	Furnace	Wipe	****	0.111	2.70	ug/ft²	9	ug/ft²	
0401630	DEDEL276-2	Furnace	Wipe	****	0.111	2.70	ug/ft²	17	ug/ft²	
0401631	DEDEL276-3	Furnace	Wipe	****	0.111	67.51	ug/ft²	200	ug/ft²	←
0401632	DEDEL276-4	Furnace	Wipe	****	0.111	5.40	ug/ft²	33	ug/ft²	
0401633	DEDEL276-5	Furnace	Wipe	****	0.111	2.70	ug/ft²	11	ug/ft²	
0401634	DEDEL276-6	Furnace	Wipe Blank	****	N/A	0.30	ug	0.76	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B
N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)
%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Analyst: [redacted] **Technical Manager:** [redacted]

An AIHA (#8863), NVLAP (# 101143), & New York ELAP (#10920) Accredited Laboratory
4475 Forbes Blvd. • Lanham, MD 20706 • (301) 459-2640 • Toll Free (800) 346-0961 • Fax (301) 459-2643

Reservoirs Environmental, Inc.

2059 Bryant St. Denver, CO 80211
(303) 964-1986 Fax (303) 477-4275 Toll Free (866) RESI-ENV

June 11, 2003

Project Description:
RES 93513-1
05-03
Delaware-Smrna,Dover,Middletown,Delaware City

Non-Responsive
Shaw Environmental, Inc.
312 Directors Drive
Knoxville TN 37923

Dear Customer,

Reservoirs Environmental, Inc. is an environmental analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the American Industrial Hygiene Association, Lab ID 101533 - Accreditation Certificate #480. The laboratory is currently proficient in both PAT & ELPAT programs respectively.

Reservoirs has analyzed the following sample(s) using Atomic Absorption (AA) / Atomic Emission Spectroscopy - Inductively Coupled Plasma (AES-ICP) per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in Table I. Results have been faxed to your office.

RES 93513-1 is the job number assigned to this study. This report is considered highly confidential and property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those authorized by the client. Samples will be disposed of after sixty days unless longer storage is requested. If you should have any questions about this report, please feel free to call me at 303-964-1986.

Sincerely,

Non-Responsive

President

RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Accredited Laboratory #101896
AIHA Certificate of Accredidation #480 LAB ID 101533

TABLE I. ANALYSIS: LEAD BY WIPE SAMPLING

RES Job Number:	**RES 93513-1**
Client:	**Shaw Environmental, Inc.**
Client Project Number / P.O.:	**05-03**
Client Project Description:	**Delaware-Smrna,Dover,Middletown,Delaware City**
Date Samples Received:	**June 2, 2003**
Analysis Type:	**USEPA SW846 3050B / AA(7420)**
Turnaround:	**3-5 Day**
Date Samples Analyzed:	**June 11, 2003**

Client ID Number	Lab ID Number	Sample Area (sq.ft.)	LEAD (µg)	Detection Limit (µg/sq.ft.)	LEAD CONCENTRATION (µg/sq.ft.)
DEDEL150-1	EM 775817	0.11	BDL	23	BDL
DEDEL150-2	EM 775818	0.11	BDL	23	BDL
DEDEL150-3	EM 775819	0.11	10.7	23	97
DEDEL150-4	EM 775820	0.11	3.0	23	27
DEDEL150-5	EM 775821	0.11	4.5	23	41
DEDEL150-6	EM 775822	0.11	5.0	23	45
DEDEL150-7	EM 775823	0.11	BDL	23	BDL
DEDEL150-8	EM 775824	0.11	BDL	23	BDL
DEDEL150-9	EM 775825	0.11	5.5	23	50
DEDEL150-10	EM 775826	0.11	BDL	23	BDL
DEDEL150-11	EM 775827	0.11	BDL	23	BDL
DEDEL150-12	EM 775828	0.11	BDL	23	BDL
DEDEL150-13	EM 775829	0.11	BDL	23	BDL
DEDEL150-14	EM 775830	0.11	BDL	23	BDL
DEDEL150-15	EM 775831	0.11	15.6	23	142
DEDEL150-16	EM 775832	0.11	BDL	23	BDL
DEDEL150-17	EM 775833	0.11	BDL	23	BDL
DEDEL150-18	EM 775834	0.11	BDL	23	BDL

***Calculations Based On A 1 sq.ft. Sample Area Unless Otherwise Noted**

BDL = Below Detection Limit

Data Qa RK

REServoir ENVIRONMENTAL SERVICES, INC.

596

2059 Bryant St., Denver CO 80211

Phone: (303) 964-1986 Fax: (303) 477-4275 WATS: 1-866-RESI ENV (737-4368)

PAGER: ONCALL Pager number available at Lab, Alternate Pagers: PLM/TEM 303-2167 PCM/Metals 303-2098 (AFTER HOURS USE ONLY)

RESI Job #: RES 93513

Due Date: 6-5-03

Due Time: 7:45

SAMPLES SUBMITTED BY:

Company: Shaw Environmental, Inc.

Address: 312 Directors Drive

Knoxville TN 37923

INVOICE TO: (IF DIFFERENT) [redacted]

Army National Guard IH-W

301-H Old Bay La, Havre de Grace, MD 21078

Contact: ~~Ken Forsythe~~ Phone: ~~410-942-0273 x10~~ Fax: ~~410-942-0254~~ Pager

Contact: [redacted] Phone (865) 694-7332 Fax (865) 690-3211 Pager

Project Number and/or P.O. #: 05-03

Project Description/Location: Delaware - Smyrna, Dover, Middletown, Delaware City

After Hours/Weekend CHARGE: Amount $ ________ Authorized by: ________

Additional fees apply for after hours and holidays for all analysis types. Samples will be analyzed during normal laboratory hours unless otherwise arranged and specified on the chain of custody. Turnaround is subject to laboratory volume. You will be notified if delays are expected.

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm

PCM/PLM ___ 2 Hour RUSH ___ 24 hour ___ 3-5 weekdays

TEM ___ 6 Hour RUSH ___ 24 hour ___ 3-5 weekdays

Prior Notice REQUIRED for TEM 6 Hour RUSH

METALS LABORATORY HOURS: Weekdays: 8am - 5pm

AA ___ SPECIAL RUSH ___ 24 Hour X 3-5 Day

RCRA 8 ___ SPECIAL RUSH ___ 5 Day ___ 10 Day

TCLP ___ SPECIAL RUSH ___ 5 Day ___ 10 Day

Prior Notice REQUIRED for SPECIAL RUSH AA, RCRA or TCLP

RCRA and TCLP SPECIAL RUSH is 3 Day Turnaround

ANALYTICAL METHOD

AIR [ ] PCM 7400A, 7400B, OSHA
[ ] TEM AHERA, Level II, 7402, ISO, Pres/Abs, ISO-Indirect Preps, Chatfield
[ ] AA / ICP ______ Metal ____ RCRA 8
Dust Total, Respirable

BULK: [ ] PLM Short report, Long report, Point Count
[ ] TEM +/-, Quant, Semi-quant
[X] AA / ICP ____ PB
Paint, Soil, Dust, (Wipe) TCLP
(ASTM E 1792 approved wipes only.)

WATER [ ] TEM Drinking, Waste Water
[ ] AA Water ______ Metal ____ RCRA 8
Drinking, Waste Water

OTHER [ ] Specify ______

Special Instructions: Contract # 78-287. Email results to kenneth.forsythe@md.ngb.army.mil

	Client Sample Number	Volume	EM #
1	DEDMLI50-1	4x4" wipes	775817
2	-2		18
3	-3		19
4	-4		20
5	-5		21
6	-6		22
7	-7		23
8	-8		24
9	-9		25
10	-10		26
11	-11		27
12	-12		28
13	-13		29
14	-14		30
15	-15		31

Number of samples received: 15 (Use as many additional sheets as needed.)

NOTE: If the package has sustained substantial damage or the custody seal is broken, stop and contact project manager and shipper. RESI will analyze incoming samples based upon information received with those samples. RESI is not responsible for errors or omissions in calculations resulting from the inaccuracy of original data. Turnaround times are based upon times of receipt by Laboratory. Call Laboratory for number of samples guaranteed in short turnaround.

Relinquished By: [redacted] Date/Time: 5/30/03 1600

Laboratory Use [redacted] Date/Time: 6/2/03 1145

Received By: [redacted]

Carrier: [redacted] ...e/custody seal upon receipt:

RESULTS: [redacted] ...age Phone Fax Date Time Initials

SPLITS: Authorization By/Time: Lab Bench/Count Sheets Received By:

Analytical Method/Turnaround: Time: Date:

rev 5/2/01 Results Due: Results Out:

BEST AVAILABLE COPY

RESERVOIRS ENVIRONMENTAL SERVICES, INC.

2059 Bryant St., Denver CO 80211

RESI Job #: 98513

Due Date: 6-5-09
Due Time: 1:45

Phone: (303) 964-1986 Fax: (303) 477-4275 WATS: 1-866-RESI ENV (737-4368)
PAGER: ONCALL Pager number available at Lab. Alternate Pagers: PLM/TEM 509-2187 PCM/Metals 509-2038 (AFTER HOURS USE ONLY)

SAMPLES SUBMITTED BY:

Company: Shaw Environmental Inc.
Address: 312 Directors Drive
Knoxville TN 37923
Contact: [redacted]
Contact: [redacted]
Phone: ~~410-942-0273 x10~~ Fax: ~~410-942-0254~~ Pager
Phone: (865) 694-7332 Fax: (865) 690-3211 Pager
Project Number and/or P.O. #: 05-02
Project Description/Location: Delaware - Smyrna, Dover, Middletown, (Delaware City)

INVOICE TO: (IF DIFFERENT) [redacted]
Army National Guard IH-W
301-H Old Bay Ln, Havre de Grace, MD 21078

After Hours/Weekend CHARGE: Amount $________ Authorized by: ________

Additional fees apply for after hours and holidays for all analysis types. Samples will be analyzed during normal laboratory hours unless otherwise arranged and specified on the chain of custody. Turnaround is subject to laboratory volume. You will be notified if delays are expected.

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm

PCM/PLM ___ 2 Hour RUSH ___ 24 hour ___ 3-5 weekdays

TEM ___ 6 Hour RUSH ___ 24 hour ___ 3-5 weekdays

Prior Notice REQUIRED for TEM 6 Hour RUSH

METALS LABORATORY HOURS: Weekdays: 8am - 5pm

AA ___ SPECIAL RUSH ___ 24 Hour X 3-5 Day

RCRA 8 ___ SPECIAL RUSH ___ 5 Day ___ 10 Day

TCLP ___ SPECIAL RUSH ___ 5 Day ___ 10 Day

Notice REQUIRED for SPECIAL RUSH AA, RCRA or TCLP
RCRA and TCLP SPECIAL RUSH is 3 Day Turnaround

ANALYTICAL METHOD

AIR: PCM 7400A, 7400B, OSHA; TEM AHERA, Level II, 7402, ISO, Prep/Abs, ISO-Indirect Preps, Chatfield; AA / ICP ____ Metal ____ RCRA 8; Dust Total Respirable

BULK: PLM Short report, Long report, Point Count; TEM +/-, Quant, Semi-quant; [X] AA / ICP ____ PB; Paint, Soil, Dust, (Wipe), TCLP (ASTM E 1792 approved wipes only)

WATER: TEM Drinking, Waste Water; AA Water ____ Metal ____ RCRA 8; Drinking, Waste Water

OTHER: Specify ________

Special Instructions: Contract # 78-287. Email results to kenneth.forsythe@md.ngb.army.mil

	Client Sample Number	Volume	EM #
1	DEDEL-150-16	4x4" wipes	228832
2	" -17	"	33
3	" -18	"	34
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

Number of samples received: 18 (Use as many additional sheets as needed.)

NOTE: If the package has sustained substantial damage or the custody seal is broken, stop and contact project manager and shipper. RESI will analyze incoming samples based upon information received with those samples. RESI is not responsible for errors or omissions in calculations resulting from the inaccuracy of original data. Turnaround times are based upon times of rece[redacted]ber of samples guaranteed in short turnaround.

Relinquished By: [redacted] Date/Time: 5/30/09 1800

Laboratory [redacted] Date/Time: 6-2-09 1:45
Received By
Carrier ... of package/custody seal upon receipt: good
RESULTS: Page Phone Fax Date Time Initials

SPLITS: Authorization By/Time:
Analytical Method/Turnaround:
Results Due: Results Out:

Lab Bench/Count Sheets Received By:
Time: Date:

rev 3/2/01

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DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
312 Directors Drive
Knoxville, TN 37923

Reference Data:	**Lead**
Client Sample No.:	DESMY149-A1 through DEDEL150-A3
P.O. No.:	05-04
Sample Location:	DE
Sample Type:	Filter
Method Reference:	NIOSH 7300
DCL Set ID No.:	03-S-2667
DCL Sample ID No.:	03-16843 through 03-16854
Sample Receipt Date:	6/2/2003
Preparation Date:	06/02/03
Analysis Date:	06/03/03

The samples were prepared and analyzed in accordance with NIOSH method 7300 using a Perkin Elmer 3000XL ICP.

The sample condition upon receipt was acceptable except where noted.

The results are in the enclosed data table. Results relate only to the items tested and are not blank corrected unless indicated in the data table.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Non-Responsive
Analyst

Non-Responsive
Reviewer

CINCINNATI OFFICE
4388 GLENDALE-MILFORD ROAD
CINCINNATI, OHIO 45242-3706
513 733-5336, FAX 513 733-5347

WEST COAST OFFICE
11 SANTA YORMA COURT
NOVATO, CALIFORNIA 94945
800 280-8071, FAX 415 893-9469

Results
Lead

Client #	DCL #	Sample Volume (L)	µg/sample	mg/m³
DESMY149-A1	03-16843	312.98	ND	<0.003
DESMY149-A2	03-16844	307.27	ND	<0.003
DESMY149-A3	03-16845	0	ND	-
DEDOV149-A1	03-16846	395.42	ND	<0.003
DEDOV149-A2	03-16847	369.9	ND	<0.003
DEDOV149-A3	03-16848	0	ND	-
DEMID150-A1	03-16849	291.48	ND	<0.003
DEMID150-A2	03-16850	293.58	ND	<0.003
DEMID150-A3	03-16851	0	ND	-
DEDEL150-A1	03-16852	536.91	ND	<0.002
DEDEL150-A2	03-16853	218.75	ND	<0.005
DEDEL150-A3	03-16854	0	ND	-
	Prep Blank		ND	
% Recovery	LCS		107.	
% Recovery	LCS DUP		101.	
RPL			1.	

ND = not detected at or above the reporting limit (RPL).
LCS = laboratory control sample.

Non-Responsive

Analyst

Non-Responsive

Reviewer

ANALYTICAL REQUEST FORM

Page 2 of 2

DATA CHEM LABORATORIES

1. ☒ REGULAR Status

☐ RUSH Status Requested - ADDITIONAL CHARGE
RESULTS REQUIRED BY _____ DATE
CONTACT DATACHEM LABS PRIOR TO SENDING SAMPLES

2. Date 5/30/03 Purchase Order No. 05-04

3. Company Name Shaw Environmental, Inc
Address 312 Directors Dr.
Knoxville, TN 37923
Person to Contact [redacted]
Telephone (865) 694-3332
Fax Telephone (865) 690-3626
Billing Address (if different from above) [redacted] - Army National Guard IH
301-IH, Old Bay Lane, Havre de Grace, Maryland 21078

4. Quote No. _____
DOL Project Manager _____

5. Sample Collection
Sampling Site DE
Industrial Process _____
Date of Collection 5/29-30/03
Time Collected various
Date of Shipment 30 May 03
Chain of Custody No. _____

[redacted]

6. REQUEST FOR ANALYSES

Laboratory 03 Use Only	Client Sample Number	Media Type*	Sample Volume (Liters)	ANALY
16843	DESMYH9-A1	MCEF	312.98	Lead
16844	" -A2	"	307.07	↓
16845	-A3	"	blank	↓
16846	DEDOVI49-A1	MCEF	395.42	Lead
16847	" -A2	"	369.9	↓
16848	" -A3	"	blank	↓
16849	DEMIDISD-A1	"	291.48	Lead
16850	" -A2	"	293.58	"
16851	" -A3	"	blank	"
16852	DEDELISE-A1	"	586.91	"
16853	" -A2	"	218.75	"
16854	" -A3	"	blank	"

*Specify: Solid sorbent tube, e.g. Charcoal; Filter type; Impinger solution; Bulk Sample; Blood; Urine; Tissue; Soil; Water; Other

6. Q C REQUIREMENTS
MUST BE COMPLETED FOR ENVIRONMENTAL SAMPLES - See General Services Terms and Conditions: QC samples billed at regular sample rate

☐ METHOD QC SAMPLES
(Lab QC according to published methods)
☐ PROJECT PLAN QC SAMPLES
(Lab QC according to provided QA/QC Plan)
☐ NO QC SAMPLES REQUESTED
(May not conform to Agency requirements)

☐ O[redacted]

Comments _____

Possible Contaminati[redacted]

7. Requested by [redacted]

960 West LeVoy Drive / Salt Lake City, UT 84123 800-356-9135 or 801-265-7700 / FAX: 801-268-9992
4388 Glendale-Milford Road / Cincinnati, OH 45242 800-458-1493 or 513-733-5000 / FAX: 513-733-5047

Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory **Location:** Delaware City
Date: 30 May 03

Sample 1

Sample Number: DEDELI50A1
Pump: 647615

	Pre Flow Rate	Post Flow Rate
	2.416	2.420
	2.418	2.424
	2.415	2.420
Average	2.416	2.421

Average Pre and Post 2.4185

Time 1 10:50
Time 2 2:32
Total Time Sampled
Minutes Sampled 222

Volume 536.913 **Liters**

Sample 2

Sample Number: DEDELI50A2
Pump: 648339

	Pre Flow Rate	Post Flow Rate
	2.414	2.449
	2.421	2.443
	2.416	2.441
Average	2.417	2.444

Average Pre and Post 2.4305

Time 1 ~~1245~~ 1300
Time 2 230
Total Time Sampled 9
Minutes Sampled 90

Volume ~~218.75~~ **Liters**
218.750

Appendix D
References

References

Title 29, Code of Federal Regulations CFR), Part 1910, Occupational Safety and Health Administration (current edition)

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc (ASHRAE) 62-2002, Ventilation for Acceptable Indoor Air Quality

Instructions for Completing the Sampling of ARMY National Guard Armories, Lead Wipe Sampling Procedure included with the Request for Proposal

Air Sampling for Lead - Method 7082 of the National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods

Design Guide DG-415-2, Logistics Facilities, National Guard Bureau Installation Division, 14 December 1999

Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998

Army Regulation (AR) 40-5, Medical Service, Preventative Medicine, 15 October 1990

AR 385-10, The Army Safety Program, 29 February 2000

Department of the Army Pamphlet (DA PAM) 40-501, Medical Services, Hearing Conservation Program, 10 December 1998

DA PAM 40-503, Medical Services, Industrial Hygiene Program, 30 October 2000

Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH) (current edition)

Guidelines for Converting Indoor Firing Ranges to Other Uses, Headquarters, Department of the Army and the Air Force, NG PAM (AR) 385-16/ANGPAM 91-101, 31 January 1994

24 CFR, Part 35, Subpart B, Section 35-110, Definition of Lead-Based Paint, Housing and Urban Development, U. S. Department of Housing

Appendix E
Recommendations for
Surface Lead Dust in Armories

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

Shaw Environmental, Inc.

312 Directors Drive
Knoxville, TN 37923
865.690.3211
Fax 865.690.3626

Shaw® Shaw Environmental, Inc.

National Guard Armory
Georgetown Readiness Center, Georgetown, Delaware

Industrial Hygiene Evaluation

Prepared for:

National Guard Region North Industrial Hygiene Office
Havre De Grace, Maryland 21078

Prepared by:

Shaw Environmental. Inc.
312 Directors Drive
Knoxville, Tennessee 37923

13 November 2003

National Guard Armory
Georgetown Readiness Center, Georgetown, Delaware

Industrial Hygiene Evaluation

Prepared for:

National Guard Region North Industrial Hygiene Office
Havre De Grace, Maryland 21078

Prepared by:
Shaw Environmental, Inc.
312 Directors Drive
Knoxville, Tennessee 37923

13 November 2003

Prepared by: Non-Responsive _____
Industrial Hygienist

Reviewed by: Non-Responsive _____
Business Line Manager

Table of Contents

List of Tables

List of Appendices

Executive Summary

Shaw Environmental, Inc. (Shaw) was contracted to perform an industrial hygiene evaluation for the Georgetown Readiness Center in Georgetown, Delaware. Non-Responsive performed the evaluation on 27 June 2003 and 2 October 2003. The point of contact at the readiness center was MAJ Non-Responsive

The following industrial hygiene concerns were evaluated.

- Wipe Sampling for Lead
- Air Sampling for Lead
- Peeling Paint – Lead
- Suspected Asbestos Containing Material
- Water Damage
- Presence of Mold
- Housekeeping
- Ergonomic Concerns
- Indoor Air Quality
- Safety and Industrial Hygiene Programs
- Ventilation System Evaluation
- Contamination of Clean Air Sources
- Noise
- Lighting
- Converted Indoor Firing Ranges
- HVAC Systems

The following items were either not applicable to the armory or the evaluation resulted in a conclusion that there were no industrial hygiene concerns.

- Air Sampling for Lead
- Peeling Paint – Lead
- Presence of Mold
- Housekeeping
- Ergonomic Concerns
- Indoor Air Quality

- Safety and Industrial Hygiene Programs
- Ventilation System Evaluation
- Contamination of Clean Air Sources
- Noise
- Converted Indoor Firing Ranges
- HVAC Systems

Areas where there were industrial hygiene concerns are as follows:

- Wipe sampling for lead revealed concentration above the recommended level of 200 micrograms per square foot ($\mu g/ft^2$) at several locations at the facility. These locations include the assembly room/drill floor (top of a filing cabinet), Room 118 (HVAC supply and exhaust air grill), kitchen (top of storage area), motor pool (flammable storage cabinet), and the vent in the chaplain's office. It is recommended that all these areas be thoroughly cleaned to reduce the lead level. In addition, any other dusty/dirty areas in the entire facility should be thoroughly cleaned since there is evidence that the lead contamination problem is widespread. Also, since lead concentrations exceeded a level of 40 $\mu g/ft^2$, thorough cleaning should be considered if a special function is held in which children will be present in this facility in the areas that will be accessible to children prior to the function.
- Floor tiles in SGT Non-Responsive office potentially contain asbestos. An operations and maintenance plan should be followed when performing any activities that may disturb the suspected asbestos-containing materials.
- Water damage was observed on the 1st floor cafeteria ceiling, the BNCDR CSM office ceiling, the S-4 Log Section ceiling, the kitchen ceiling, hallway, SGT Non-Responsive office ceiling, the Chaplain's office ceiling, and on the dining area ceiling. The source was probably from roof leaks, however, the source should be identified and actions taken to eliminate the source in order to prevent the possibility of mold growth that may lead to indoor air quality problems.
- Lighting measurements were conducted at the armory. The lighting did not meet the minimum requirements in some areas evaluated, therefore, consideration should be given to providing more lighting to the areas evaluated.

1.0 Introduction

Shaw Environmental, Inc. was contracted to perform an industrial hygiene evaluation for the Georgetown Readiness Center in Georgetown, Delaware. Non-Responsive performed the evaluation on 27 June 2003 and 2 October 2003. The point of contact at the readiness center was MAJ Non-Responsive

The findings, discussion, and interpretation of results are provided in Section 2.0. The conclusions are provided in Section 3.0. The HHIM data forms for the facility are provided in Appendix A. The building layout is provided in Appendix B. Sampling sheets and laboratory analyses are provided in Appendix C. References are provided in Appendix D. The *Recommendations for Surface Lead Dust in Armories* document is provided in Appendix E.

The statements, opinions, and conclusions contained in this report are based solely upon the services performed by Shaw as described in the report. In performing these services and preparing the report, Shaw relied upon the work and information provided by others, including public agencies, whose information is not guaranteed by Shaw Environmental, Inc.

2.0 Findings, Discussion, and Interpretation of Results

The results, discussion, and interpretation of results are provided in the following sections.

2.1. Sampling for Lead

2.1.1 Wipe Sampling

Wipe samples were collected for lead from the drill floor/assembly area. Also, wipe samples were collected for lead in rooms, hallways, foyers, etc. The sampling in rooms, hallways, foyers, etc represented approximately 25% of the building. Approximately half of the samples were collected from surfaces in common areas, such as surfaces of a desk. The remaining samples were collected from uncommon surface areas, such as a supply vent or the top of a file cabinet. The samples were collected and analyzed in accordance with the Instructions for *Completing the Sampling of ARMY National Guard Armories* procedure.

The only samples initially submitted for analysis were those from the drill floor/ assembly area. If there were positive results from the drill floor/assembly area, the other samples would be submitted for analysis.

Results of the wipe sampling are provided in Table 1. The results revealed lead in several locations were above the recommended level of 200 micrograms lead per square foot ($\mu g/ft^2$) (see Appendix E). The high lead concentrations were found at the following locations:

- assembly hall (top of locker), at 490 micrograms lead per square foot ($\mu g/ft^2$);
- Room 18 (HVAC exhaust air grill), at 2300 $\mu g/ft^2$;
- Room 18 (HVAC supply air grill), at 1000 $\mu g/ft^2$;
- kitchen (top of storage locker), at 450 $\mu g/ft^2$;
- motor pool (flammable storage cabinet), at 990 $\mu g/ft^2$; and
- Chaplain's Office (vent), at 1700 $\mu g/ft^2$.

It is recommended that all these areas be thoroughly cleaned to reduce the lead level. In addition, any other dusty/dirty areas in the entire facility should be thoroughly cleaned since there is evidence that the lead contamination problem is widespread.

Wipe sampling for lead revealed concentrations above a level of 40 $\mu g/ft^2$ in several areas of the facility. Please note that the *Recommendations for Surface Lead Dust in Armories* (Appendix E) states that all areas should be cleaned that will be accessible to children. If a special function is held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function.

2.1.2 Air Sampling

Breathing zone air sampling was conducted on two (2) full-time building occupants. (Please note that no State employees were monitored.) The samples were collected and analyzed in accordance with Method 7082 of the National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods.

The results of the sampling are provided in Table 2. The results revealed non-detectable concentrations of lead in the breathing zone of the employee; therefore, no action is necessary.

2.2 Physical Condition of Facility

2.2.1 Peeling Paint - Lead

Peeling paint was observed in the armory. Bulk sampling results revealed lead concentrations at levels below 0.5 percent by weight. The Department of Housing and Urban Development (HUD) defines a lead-based paint as paint or other surface coatings that contain lead equal to or exceeding 0.5 percent by weight. Since this paint does not meet the HUD criteria of a lead-based paint, no actions are necessary. The results of the sampling are provided in Table 3.

2.2.2 Visual Inspection - Asbestos

A visual inspection was made to determine if there was any suspected asbestos-containing material at the armory. Materials suspected of containing asbestos were observed. The suspected asbestos-containing materials, with condition and estimated quantity, were at the following locations:

- SGT [redacted] Office Floor Tiles – Good Condition, Approximately 360 Square Feet

An operations and maintenance plan should be followed when performing any activities that may disturb the suspected asbestos-containing materials.

2.2.3 Visual Inspection – Water Damage and Mold

A visual inspection was made to determine if there was any water damage or visible mold at the armory. Visible mold was not observed, however, water damage was observed at the armory. Water damage was observed on the 1st floor classroom ceiling, the BNCDR CSM office ceiling, the S-4 Log Section ceiling, the kitchen ceiling, hallway, SGT [redacted] office ceiling, the Chaplain's office ceiling, and on the dining area ceiling

The source of the water damage was likely from roof leaks. The source of the water damage should be identified and actions taken to eliminate the source in order to prevent the possibility of mold growth that may lead to indoor air quality problems.

2.2.4 Visual Inspection - Housekeeping

The housekeeping was determined to be good. No trash was visible on the floors.

2.3. Building Concerns

2.3.1 Ergonomic Concerns

Interviews with employees and observation of work activities revealed no ergonomic concerns at the armory.

2.3.2 Indoor Air Quality

Interviews with employees and measurements for carbon dioxide, humidity, and temperature revealed that the temperature in the drill floor area was slightly higher than the guidelines established by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE). However, due to the high outdoor temperature on the date of the evaluation and that measures were not taken to cool the unused drill floor area, it is deemed that the indoor air quality is acceptable at the armory.

The results of the measurements for carbon dioxide, humidity, and temperature are

provided in Table 4.

2.4. Safety and Industrial Hygiene Programs

An evaluation was performed to determine the applicability of the following programs.

- Confined Spaces
- Hearing Conservation
- Respiratory Protection
- Hazard Communication (HAZCOM)
- Personal Protective Equipment (PPE)

It was determined that none of the programs were applicable at the armory.

2.5. Ventilation

2.5.1 Ventilation System Evaluation

There were no local exhaust ventilation systems at this armory, therefore, no ventilation studies were performed.

2.5.2 Contamination of Clean Air Sources

Since there were no local exhaust ventilation systems at the armory, there was no possibility that clean air sources could be contaminated by exhaust air.

2.6. Noise Exposure

An evaluation was performed to determine if there were any hazardous noise areas at the armory. It was determined that there were no areas at the armory that would exceed the permissible exposure limit for noise.

2. 7 Lighting

Lighting measurements were conducted at the armory. The lighting did not meet the minimum requirements in the following areas:

- Dining Area
- Drill Floor
- Women's Latrine

- Classroom
- SFC [redacted] Office

Results of the lighting evaluation are provided in Table 5. Consideration should be given to providing more lighting to the areas listed above. This may be accomplished by replacing burnt out luminaries, cleaning fixtures, cleaning windows, painting walls with a lighter color, repositioning detailed work to higher illuminated areas, and using supplemental lighting.

2. 8. Converted Indoor Firing Ranges

There was a firing range in the process of conversion. No wipe samples were taken because the firing range was in the process of being converted and lighting had been removed from the room.

2.9. HVAC System

The maintenance schedule for the HVAC system was evaluated to verify that maintenance occurs on a regular basis. Also, the condition of the HVAC system was evaluated to determine if the maintenance performed is effective. It was deemed that maintenance occurs on a regular basis, and the maintenance performed is effective. Note that the vent in the BNXO/AO office shows some discoloration, but no actions are deemed necessary.

Maintenance should occur on a regular basis to ensure that the HVAC system is maintained in a good condition.

2.10. HHIM

A Health Hazard Information Module (HHIM) form was completed for the armory. The completed form is provided in Appendix A.

3.0 Conclusions

It is concluded that there were no industrial hygiene concerns at the armory with regards to atmospheric exposure to lead, peeling lead-based paint, visible mold, housekeeping, ergonomic conditions, indoor air quality, safety and industrial hygiene programs, ventilation systems or contamination of clean air sources, noise exposure, surface lead contamination in the converted firing range, and HVAC systems.

There were industrial hygiene concerns at the armory with regards to lead surface contamination, water damage, suspected asbestos-containing material, and lighting. These concerns are discussed in detail in Section 2.0 of this report.

TABLES

Table 1

Wipe Sampling for Lead

National Guard Armory

Georgetown, Delaware

Date of Sampling: 27 June 2003 and 2 October 2003

Sample Number	Location	Results,µ g/ft^2 [a]
DEGEO275-1	Room 18 - - HVAC Exhaust Air Grill	2300
DEGEO275-2	Room 18 - - HVAC Supply Air Grill	1000
DEGEO275-3	Room 19 - - Heating Air Grill	63
DEGEO275-4	Kitchen – Top of Storage Locker	450
DEGEO275-5	Assembly Hall – Top of Filing Cabinet	490
DEGEO275-6	Field Blank	0.91 µg
DEGEO178-1	Assembly Hall - On Floor	<23
DEGEO178-2	Assembly Hall - On Floor	< 23
DEGEO178-3	Assembly Hall - On Floor	< 23
DEGEO178-4	Assembly Hall - On Floor	< 23
DEGEO178-5	Assembly Hall - On Floor	< 23
DEGEO178-6	Field Blank	< 23 µg
DEGEO178-7	MAJ [redacted] Non-Responsive Office – Desk Top	5.4
DEGEO178-8	Classroom Filing Cabinet	14
DEGEO178-9	Basement Kitchen Counter (Below Vent)	90
DEGEO178-10	Maintenance – Motor Pool Flammable Storage Cabinet	990
DEGEO178-11	Chaplain's Office – Vent	1700
DEGEO178-12	Field Blank	< 0.3 µg
DEGEO178-13	156 / Training Office Windowsill	7.8
DEGEO178-14	S-3 BNTNG Basement Desk	7.2
DEGEO178-18	Field Blank	< 0.3 µg

[a] Micrograms lead per square foot

The samples were taken and analyzed in accordance with the Instructions for *Completing the Sampling of ARMY National Guard Armories* procedure.

Table 2
Breathing Zone Air Samples for Lead
National Guard Armory
Georgetown, Delaware
Date of Sampling: 27 June 2003

Sample Number	Employee	Sampling Information			Results (mg/m^3) [a]
		Time Sampled / Minutes	Flow Rate (lpm) [b]	Volume (liters)	
DEGEO178-A1	Non-Responsive	0842-0935 / 53	2.516	133.35	<0.007
DEGEO178-A2		0853-0943 / 50	2.505	125.25	<0.008
DEGEO178-A3	Field Blank	-	-	-	None Detected

[a] Milligrams lead per cubic meter of air.
[b] Liters of air per minute.

Method 7082 of the National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods was followed for sampling for lead.

Table 3
Peeling Paint Sampling for Lead
National Guard Armory
Georgetown, Delaware
Date of Sampling: 27 June 2003

Sample Number	Location	Results, % By Weight
DEGEO178-PC1	Stairwell ceiling	Not Detected
DEGEO178-PC2	Kitchen pipes	0.0068
DEGEO178-PC3	Kitchen (behind oven)	0.027
DEGEO178-PC4	Men's latrine	0.068

The Department of Housing and Urban Development (HUD) defines lead-based as paint or other surface coatings that contain lead equal to or exceeding 0.5 percent by weight.

Table 4
Indoor Air Quality Measurements for Carbon Dioxide, Humidity, and Temperature
National Guard Armory
Georgetown, Delaware
Date of Sampling: 27 June 2003

Location	Occupants in Area	Carbon Dioxide, parts per million parts of air (ppm)	Percent (%) Humidity	Temperature (°F)
1st Floor–Drill Floor	2	463	60.2	82.8
Basement—SGT Non-Responsive Office	3	709	55.6	79.0
Outdoors	-	320	61.5	90

Carbon dioxide, humidity, and temperature measurements were taken with a TSI Q Trak Plus, Model 8554, Indoor Air Quality Meter, calibrated in April 2003.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommends that indoor carbon dioxide levels be less than 700 ppm above outdoor levels.

ASHRAE recommends that the relative humidity levels be maintained between 30 to 60 percent.

ASHRAE recommends that the acceptable temperature range be 68 degrees Fahrenheit to 74 degrees Fahrenheit in the winter and 73 degrees Fahrenheit to 79 degrees Fahrenheit in the summer.

1

Appendix A
HHIM Data Form

HEALTH HAZARD INFORMATION MODULE: INDUSTRIAL HYGIENE SURVEY

(For use of this form, see HHIM User's Guide)

SECTION 1. DEMOGRAPHIC DATA

ARLOC	INSTALLATION	BLDG/RM NO.
42394	RC, Georgetown	Georgetown

LOCATION/CODE	OPERATION/CODE
Administrative Areas/AA	Administrative Operations/ADO

SURVEY DATE	EVALUATOR (Initials)
27 June 03	AG

MACOM/CODE	SUBMACOM/CODE	SUPERVISOR
7A	XX	1SG [redacted] Non-Responsive

TELEPHONE/DSN NO.	UNIT/ORGANIZATION	RAC	FREQUENCY (hrs/day)
(302) 326-7600	National Guard	5	8

NO. CIV(S)	NO. MIL	NO. CONTRACTOR(S)	NO. LOC(S)	NO. OTHER
	10			

SECTION 2. FACILITY DATA

LAB HOODS	VAPOR DEGREASERS	SPRAY BOOTHS
0	0	0

MAINTENANCE BAYS	OPEN SURFACE TANKS	VENTILATION UNITS
0	0	0

SECTION 3. SURVEY DATA

CONTROLS PRESENT	EVALUATION	UNIT CODE	CONTROLS REQUIRED	STATUS

PERSONAL PROTECTIVE EQUIPMENT (R = Required; U = Utilized)

GLOVES	R/U	RESPIRATOR	NIOSH TC NO.	MANUFACTURER	R/U
ACID	/	AIRLINE			/
COLD SURFACES	/	ABRASIVE BLASTING HOOD			/
HOT SURFACES	/	DISPOSABLE			/
NBC AGENTS	/	FULL FACE AIR PURIFYING			/
OIL	/	1/2 FACE AIR PURIFYING			/
SOLVENTS	/	POWERED AIR PURIFYING			/
SURGICAL GLOVES	/	1/4 FACE AIR PURIFYING			/
		SELF CONTAINED			/

EYES/FACE	R/U	HEARING	R/U	BODY	R/U	HEAD/FIT	R/U
CHEMICAL SPLASH	/	CANAL CAPS	/	APRONS	/	COLD WEATHER BOOTS/HATS	/
FULL FACE SHIELD	/	EARPLUGS	/	COLD WEATHER CLOTHING	/	HARD HATS	/
CHEMICAL/SAFETY	/	HELMETS	/	COVERALLS	/	IMPERMEABLE BOOTS	/
SAFETY/IMPACT	/	MUFFS	/	FULL BODY SUIT	/	SAFETY/CONDUCTIVE SHOES	/
WELDING HELMET	/	MUFF/EARPLUG COMBO	/	HEAT REFLECTIVE VEST/SUIT	/	SAFETY/NON-CONDUCTIVE SHOES	/
		MUFF/EARPLUG W/TIME LIMIT	/	SAFETY BELT/HARNESS	/		/

Attach 4

SECTION 4. HAZARD INVENTORY DATA

CAS CODE	HAZARD DESCRIPTION	PAC	EPC
POVDTXXXX	Video Display Terminal	3 - Low	D - Uncontrolled Physical
1332-21-4	Asbestos, Other	3 - Low	C - Uncontrolled Respiratory

SECTION 5. PERSONNEL DATA

LAST NAME	FIRST NAME	MI	SEX	SSN	CATEGORY
NAG	[redacted]				MIL
CPT		C	M		MIL
2W4					MIL
NSG					MIL
FC					MIL
3SG					MIL
SG					MIL
5SG					MIL
1GT			F		MIL
PFC					MIL

TS

See attached sheet

MIL

Survey conducted by MS. [redacted]. There are 10 full-time employees present at this facility. Employees perform mainly administrative functions.

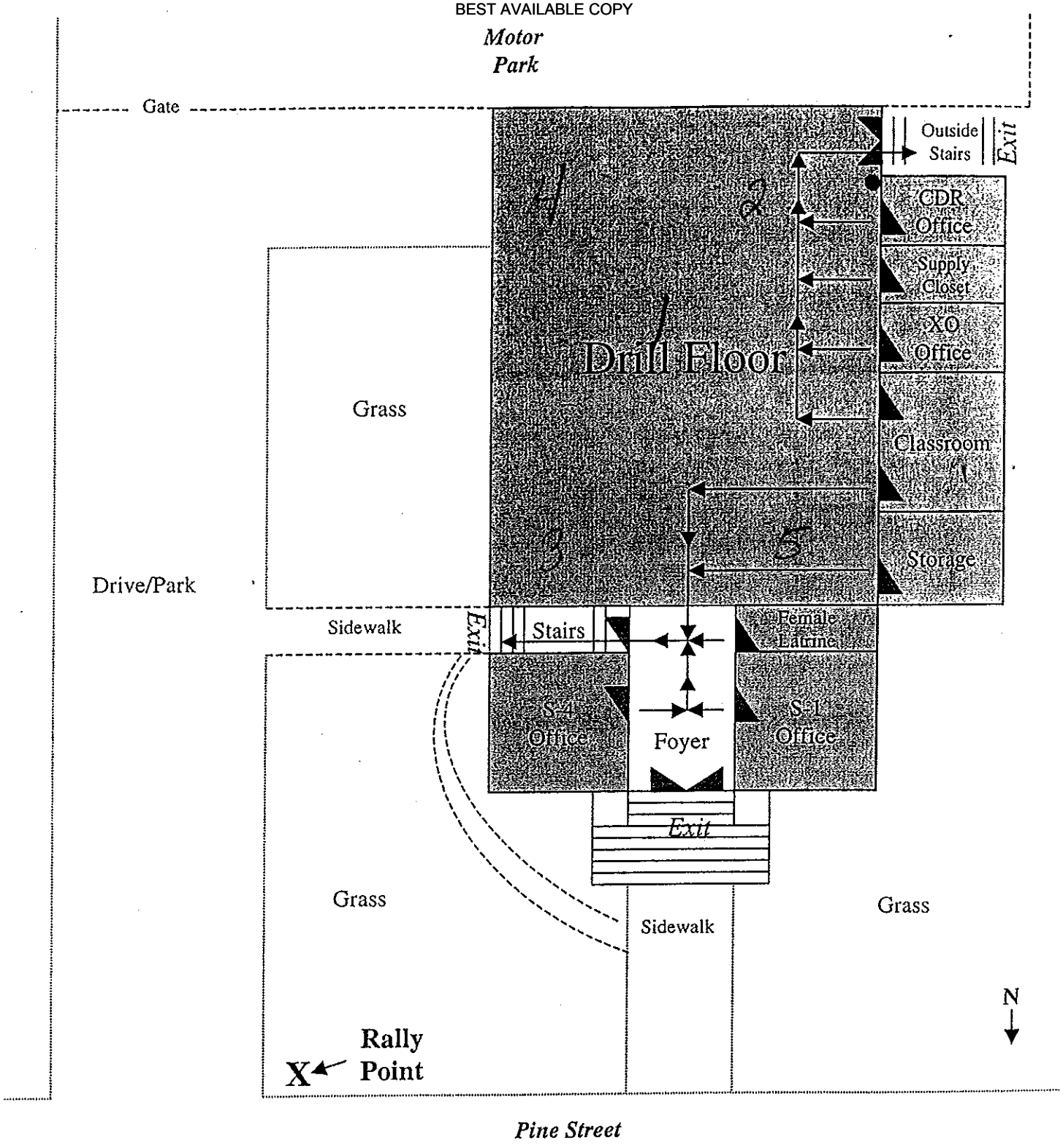
PRIVACY ACT STATEMENT

Title 5 US Code, Section 301; Executive Order 9397 authorizes the use of your Social Security Number as an identification number. The purpose of this information is to identify and monitor data relating each DA civilian and military employee exposed to a hazardous workplace or operation. The use of this information is to provide histories of exposures for any given worker.

Disclosure of your Social Security Number is not mandatory; however, nondisclosures may result in untimely provision of proper medical monitoring.

Attach 4

Appendix B
Building Layout



Appendix C
Sampling Sheets and Laboratory Analyses

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Delaware National Guard Survey	**Chain Of Custody:**	118595
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Georgetown	**Date Analyzed:**	10/14/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	1002	**Report Date:**	14-Oct-03

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0401599	DEGE0275-1	Furnace	Wipe	****	0.111	270.03	ug/ft²	2300	ug/ft²	
0401600	DEGE0275-2	Furnace	Wipe	****	0.111	270.03	ug/ft²	1000	ug/ft²	
0401601	DEGE0275-3	Furnace	Wipe	****	0.111	13.50	ug/ft²	63	ug/ft²	
0401602	DEGE0275-4	Furnace	Wipe	****	0.111	270.03	ug/ft²	450	ug/ft²	
0401603	DEGE0275-5	Furnace	Wipe	****	0.111	270.03	ug/ft²	490	ug/ft²	
0401604	DEGE0275-6	Furnace	Wipe Blank	****	N/A	0.30	ug	0.91	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Analy[redacted]

Technical Manager: [redacted]

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Delaware	**Chain Of Custody:**	119008
Address:	301-JH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Georgetown	**Date Analyzed:**	11/12/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	10-07	**Report Date:**	12-Nov-03

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Final Result		Comments
0407543	DEGEO178-7	Furnace	Wipe	****	0.111	2.70	ug/ft^2	5.4	ug/ft^2	
0407544	DEGEO178-8	Furnace	Wipe	****	0.111	2.70	ug/ft^2	14	ug/ft^2	
0407545	DEGEO178-9	Furnace	Wipe	****	0.111	33.75	ug/ft^2	90	ug/ft^2	
0407546	DEGEO178-10	Furnace	Wipe	****	0.111	202.52	ug/ft^2	990	ug/ft^2	
0407547	DEGEO178-11	Furnace	Wipe	****	0.111	337.53	ug/ft^2	1700	ug/ft^2	
0407548	DEGEO178-12	Furnace	Wipe Blank	****	N/A	0.30	ug	< 0.3	ug	
0407549	DEGEO178-13	Furnace	Wipe	****	0.111	2.70	ug/ft^2	7.8	ug/ft^2	
0407550	DEGEO178-14	Furnace	Wipe	****	0.111	2.70	ug/ft^2	7.2	ug/ft^2	
0407551	DEGEO178-18	Furnace	Wipe Blank	****	N/A	0.30	ug	< 0.3	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Analyst [redacted]

Technical Manager: [redacted]

Reservoirs Environmental, Inc.
2059 Bryant St. Denver, CO 80211
(303) 964-1986 Fax (303) 477-4275 Toll Free (866) RESI-ENV

July 10, 2003

Project Description:
RES 94963-1
06-08
Delaware-Georgetown,Harrington

Non-Responsive
Shaw Environmental, Inc.
312 Directors Drive
Knoxville TN 37923

Dear Customer,

Reservoirs Environmental, Inc. is an environmental analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the American Industrial Hygiene Association, Lab ID 101533 - Accreditation Certificate #480. The laboratory is currently proficient in both PAT & ELPAT programs respectively.

Reservoirs has analyzed the following sample(s) using Atomic Absorption (AA) / Atomic Emission Spectroscopy - Inductively Coupled Plasma (AES-ICP) per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in Table I. Results have been faxed to your office.

RES 94963-1 is the job number assigned to this study. This report is considered highly confidential and property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those authorized by the client. Samples will be disposed of after sixty days unless longer storage is requested. If you should have any questions about this report, please feel free to call me at 303-964-1986.

Sincerely,

Non-Responsive

President

RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Accredited Laboratory #101896
AIHA Certificate of Accredidation #480 LAB ID 101533

TABLE I. ANALYSIS: LEAD BY WIPE SAMPLING

RES Job Number:	**RES 94963-1**
Client:	**Shaw Environmental, Inc.**
Client Project Number / P.O.:	**06-08**
Client Project Description:	**Delaware-Georgetown,Harrington**
Date Samples Received:	**July 3, 2003**
Analysis Type:	**USEPA SW846 3050B / AA(7420)**
Turnaround:	**3-5 Day**
Date Samples Analyzed:	**July 10, 2003**

Client ID Number	Lab ID Number	Sample Area (sq.ft.)	LEAD (µg)	Detection Limit (µg/sq.ft.)	LEAD CONCENTRATION (µg/sq.ft.)
DEGEO178-1	EM 791266	0.11	BDL	23	BDL
DEGEO178-2	EM 791267	0.11	BDL	23	BDL
DEGEO178-3	EM 791268	0.11	BDL	23	BDL
DEGEO178-4	EM 791269	0.11	BDL	23	BDL
DEGEO178-5	EM 791270	0.11	BDL	23	BDL
DEGEO178-6	EM 791271	0.11	BDL	23	BDL
DEHAR178-1	EM 791272	0.11	BDL	23	BDL
DEHAR178-2	EM 791273	0.11	BDL	23	BDL
DEHAR178-3	EM 791274	0.11	BDL	23	BDL
DEHAR178-4	EM 791275	0.11	BDL	23	BDL
DEHAR178-5	EM 791276	0.11	BDL	23	BDL
DEHAR178-6	EM 791277	0.11	BDL	23	BDL

***Calculations Based On A 1 sq.ft. Sample Area Unless Otherwise Noted**

BDL = Below Detection Limit

Data Qa

RESERVOIRS ENVIRONMENTAL, INC.

2059 Bryant St., Denver CO 80211

RESI Job #: RES 94963

Due Date: 2-9-??

Due Time: 10:05

Page 1 of 1

SAMPLES SUBMITTED BY:
Company: Shaw Environmental, Inc.
Address: 812 Directors Drive
Knoxville, TN 37923
Contact: [redacted] Phone: (302)368-3736 Fax: (410)436-2163 Pager:
Contact: Phone: Fax: Pager:
Project Number and/or P.O. #: 06 - D8
Project Description/Location: Delaware, Georgetown, Harrington

INVOICE TO: (IF DIFFERENT)
[redacted]
Army National Guard HAV
301-81 Old Bay Ln, Havre de Grace, MD 21078
Final Data Deliverable Email Address: [redacted] ...

After Hours/Weekend CHARGE: Amount $ ______ Authorized by: ______

Additional fees apply for after hours and holidays for all analysis types. Samples will be analyzed during normal laboratory hours unless otherwise arranged and specified on the chain of custody. Turnaround is subject to laboratory volume. You will be notified if delays are expected.

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm
PCM/PLM ___ 2 Hour RUSH ___ 24 hour ___ 3-5 weekdays
TEM ___ 6 Hour RUSH ___ 24 hour ___ 3-5 weekdays
Prior Notice REQUIRED for TEM 6 Hour RUSH

METALS LABORATORY HOURS: Weekdays: 8am - 5pm
AA ___ SPECIAL RUSH ___ 24 Hour X 3-5 Day
RCRA 8 ___ SPECIAL RUSH ___ 5 Day ___ 10 Day
TCLP ___ SPECIAL RUSH ___ 5 Day ___ 10 Day
Prior Notice REQUIRED for SPECIAL RUSH AA, RCRA or TCLP
RCRA and TCLP SPECIAL RUSH is 3 Day Turnaround

ANALYTICAL METHOD
AIR: PCM 7400A 7400B OSHA; TEM AHERA Level II 7402 ISO; Prev/Abs ISO-Indirect Preps Charfield; AA/ICP ______ Metal ___ RCRA 8; Dust Total Respirable
BULK: PLM Short report, Long report, Point Count; TEM Qual, Semi-quant; X AA/ICP ______ Metal ___ RCRA 8; Paint, Soil, Dust, (Wipe), TCLP (ASTM E 1792 approved wipes only)
WATER: TEM Drinking, Waste Water; AA Water ______ Metal ___ RCRA 8; Drinking, Waste Water
OTHER: Specify ______

Special Instructions: Please report in ft 2. Contract # 78-297. Email results to kenneth.forsythe@md.ngb.army.mil

#	Client Sample Number	Volume	EM #
1.	DEGE0118-1	1 x 1 ft² wipes	94-1266
2.	" -2		67
3.	" -3		68
4.	" -4		69
5.	" -5		70
6.	" -6		71
7.	DEHAR0118-1		72
8.	" -2		73
9.	" -3		74
10.	" -4		75
11.	" -5		76
(12.)	" -6		77
13.			
14.			
15.			

Number of samples received: 12 (Use as many additional sheets as needed.)

NOTE: If the package has sustained substantial damage or the custody seal is broken, stop and contact project manager and shipper. RESI will analyze incoming samples based upon information received with those samples. RESI is not responsible for errors or omissions in calculations resulting from the inaccuracy of original data. Turnaround times are based upon [redacted] ... Call laboratory for number of samples guaranteed in the turnaround.

Relinquis[redacted] Date/Time: 2/1/03 8:00 pm

Laborator[redacted] Date/Time: 2/2/03 10:05

Received By / Carrier / RESULTS [redacted] ...custody seal upon receipt: ... Fax Email Date Time Initials

Lab Bench/Count Sheets Received By:
Time: Date:

SPLITS: Authorization By/Time:
Analytical Method/Turnaround:
Results Due: Results Out:

(rev 5/30)

Phone: (303) 964-1986 · Fax: (303) 477-4275 · WATS: 1-866-RESI-ENV (737-4368)
PAGER/ONCALL: Page number available at Lab. Alternate Pagers: PLM/TEM 509-2187 PCM/Metals 509-2058 (AFTER HOURS USE ONLY)

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
312 Directors Drive
Knoxville, TN 37923

Reference Data:	Lead
Client Sample No.:	DEGE0178-A1 through DEWIL177-A3
P.O. No.:	06-07
Sample Location:	DE
Sample Type:	Filter
Method Reference:	NIOSH 7300
DCL Set ID No.:	03-S-3222
DCL Sample ID No.:	03-20046 through 03-20055
Sample Receipt Date:	7/3/2003
Preparation Date:	07/07/03
Analysis Date:	07/07/03

The samples were prepared and analyzed in accordance with NIOSH method 7300 using a Perkin Elmer 3000XL ICP.

The sample condition upon receipt was acceptable except where noted.

The results are in the enclosed data table. Results relate only to the items tested and are not blank corrected unless indicated in the data table.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Non-Responsive
Analyst

Non-Responsive
Reviewer

CINCINNATI OFFICE
4388 GLENDALE-MILFORD ROAD
CINCINNATI, OHIO 45242-3706
513 733-5336, FAX 513 733-5347

WEST COAST OFFICE
11 SANTA YORMA COURT
NOVATO, CALIFORNIA 94945
800 280-8071, FAX 415 893-9469

Results
Lead

Client #	DCL #	Sample Volume (L)	µg/sample	mg/m³
DEGE0178-A1	03-20046	133.35	ND	<0.007
DEGE0178-A2	03-20047	125.25	ND	<0.008
DEGE0178-A3	03-20048	0	ND	-
DEWIL177-A1	03-20053	133.81	ND	<0.007
DEWIL177-A2	03-20054	181.55	ND	<0.006
DEWIL177-A3	03-20055	0	ND	-
	Prep Blank		ND	
% Recovery	LCS		104.	
RPL			1.	

ND = not detected at or above the reporting limit (RPL).
LCS = laboratory control sample.

Non-Responsive [redacted]
Analyst

Non-Responsive [redacted]
Reviewer

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
312 Directors Drive
Knoxville, TN 37923

Reference Data:	**Lead**
Client Sample No.:	DEGE0178-PC1 through DEGE0178-PC4
P.O. No.:	06-07
Sample Location:	DE
Sample Type:	Paint Chip
Method Reference:	3050B/6010B
DCL Set ID No.:	03-S-3222
DCL Sample ID No.:	03-20049 through 03-20052
Sample Receipt Date:	7/3/2003
Preparation Date:	7/8/2003
Analysis Date:	7/9/2003

The samples were prepared in accordance with EPA method 3050B. Sample condition was acceptable upon receipt except where noted. The samples were then analyzed in accordance with EPA method 6010B using a Jarrell Ash Trace ICP.

The results are provided in the enclosed data table. Results relate only to the items tested and are not blank corrected unless indicated in the data table.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Non-Responsive

Analyst

Non-Responsive

Reviewer

CINCINNATI OFFICE
4388 GLENDALE-MILFORD ROAD
CINCINNATI, OHIO 45242-3706
513 733-5336, FAX 513 733-5347

WEST COAST OFFICE
11 SANTA YORMA COURT
NOVATO, CALIFORNIA 94945
800 280-6071, FAX 415 883-9469

Results
Lead

Client #	DCL #	mg/Kg (ppm)	% by weight
DEGE0178-PC1	03-20049	ND	ND
DEGE0178-PC2	03-20050	68.	0.0068
DEGE0178-PC3	03-20051	270.	0.027
DEGE0178-PC4	03-20052	680.	0.068
	Prep Blank	ND	-
% Recovery	LCS	93.	-
% Recovery	20335MS	98.	-
% Recovery	20335MSD	97.	-
RPL		25.	0.0025

ND = not detected at or above the reporting limit (RPL).
LCS = laboratory control sample.
MS/MSD = matrix spike/matrix spike duplicate.

Non-Responsive [redacted]
Analyst

Non-Responsive [redacted]
Reviewer

DATA CHEM LABORATORIES

ANALYTICAL REQUEST FORM

1. X REGULAR Status

RUSH Status Requested - ADDITIONAL CHARGE
RESULTS REQUIRED BY _____ DATE
CONTACT DATACHEM LABS PRIOR TO SENDING SAMPLES.

2. Date 6/30/03 Purchase Order No. 06-07

3. Company Name Shaw Environmental, Inc.
Address 312 Directors Drive
Knoxville, TN 37923
Person to Contact Non-Responsive
Telephone (308) 369-3736
Fax Telephone (410) 456-2163
Billing Address (if different from above)
Non-Responsive Army National Guard IH-W
301-111, Old Bay Lane, Havre de Grace, MD 21078

4. Quote No. _____
DCL Project Manager _____

5. Sample Collection
Sampling Site DE
Industrial Process _____
Date of Collection 6/27/03, 6/26/03
Time Collected Various
Date of Shipment 7/1/03
Chain of Custody No. _____
Non-Responsive

6. REQUEST FOR ANALYSES 03-S2-3222 V

Laboratory Use Only 01	Client Sample Number	Media Type*	Sample Volume (Liters)	ANALYSES REQUESTED - Use Method Number if Known
20046	DEGE0178-A1	MCEF	133.35	Lead
20047	" -A2	"	125.25	"
20048	" -A3	"	Blank	"
20049	" -PC1	"	Bulk	"
20050	" -PC2	"	"	"
20051	" -PC3	"	"	"
20052	" -PC4	"	"	"
20053	DEWL0177-A1	MCEF	133.81	"
20054	" -A2	"	181.55	"
20055	" -A3	"	Blank	"

*Specify: Solid sorbent tube, e.g. Charcoal; Filter type; Impinger solution; Bulk Sample; Blood; Urine; Tissue; Soil; Water; Other

7. Q C REQUIREMENTS
MUST BE COMPLETED FOR ENVIRONMENTAL SAMPLES - See General Services Terms and Conditions: QC samples billed at regular sample rate

☐ METHOD QC SAMPLES (Lab QC according to published methods)
☐ PROJECT PLAN QC SAMPLES (Lab QC according to provided QA/QC Plan)
☐ NO QC SAMPLES REQUESTED (May not conform to Agency requirements)
☐ OTHER (as specified below)
Non-Responsive

Comments Please email results to Non-Responsive or fax to his attention at (410) 942-0254.

Possible Contamination and/or Chemical Hazards

8. Requested by Non-Responsive

4388 Glendale-Milford Road / Cincinnati, OH 45242
800-356-9135 or 801-266-7700 / Fax: 801-268-9992
800-458-1493 or 513-733-5336 / Fax: 513-733-5347

DATACHEM LABORATORIES - A SORENSON COMPANY

DISTRIBUTION: WHITE - LABORATORY COPY CANARY - CUSTOMER COPY

&14Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory **Location:** Georgetown
Date: 6/27/03

Sample 1
Sample Number: DEGEO178-A1
Pump: ~~648339~~ 647615

	Pre Flow Rate	Post Flow Rate
	2532	2508
	2532	2490
	2528	2509
Average	2523	2501
	2529	2502

Average Pre and Post 2.516

Time 1 8:42
Time 2 9:35
Total Time Sampled 2.516 L/min
Minutes Sampled 53 min

$2.516 \frac{L}{\cancel{min}} \times 53 \cancel{min} = 133.3$

Volume 133.35 **Liters**

Sample 2
Sample Number: DEGEO178-A2
Pump: 648339

	Pre Flow Rate	Post Flow Rate
	2511	2494
	2515	2496
	2510	2494
Average	2510	2502
	2512	2497

Average Pre and Post 2.505 L/min

Time 1 8:53
Time 2 9:43
Total Time Sampled
Minutes Sampled 50 min

$2.505 \frac{L}{min} \times 50 \cancel{min} = 125.2$

Volume 125.25 **Liters**

Appendix D
References

References

Title 29, Code of Federal Regulations CFR), Part 1910, Occupational Safety and Health Administration (current edition)

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc (ASHRAE) 62-2002, Ventilation for Acceptable Indoor Air Quality

Instructions for Completing the Sampling of ARMY National Guard Armories, Lead Wipe Sampling Procedure included with the Request for Proposal

Air Sampling for Lead - Method 7082 of the National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods

Design Guide DG-415-2, Logistics Facilities, National Guard Bureau Installation Division, 14 December 1999

Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998

Army Regulation (AR) 40-5, Medical Service, Preventative Medicine, 15 October 1990

AR 385-10, The Army Safety Program, 29 February 2000

Department of the Army Pamphlet (DA PAM) 40-501, Medical Services, Hearing Conservation Program, 10 December 1998

DA PAM 40-503, Medical Services, Industrial Hygiene Program, 30 October 2000

Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH) (current edition)

Guidelines for Converting Indoor Firing Ranges to Other Uses, Headquarters, Department of the Army and the Air Force, NG PAM (AR) 385-16/ANGPAM 91-101, 31 January 1994

24 CFR, Part 35, Subpart B, Section 35-110, Definition of Lead-Based Paint, Housing and Urban Development, U. S. Department of Housing

Appendix E
Recommendations for
Surface Lead Dust in Armories

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot (□g/ft^2). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 µg/ft²) and windowsills (250 µg/ft²) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 □g/ft^2 in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 □g/ft^2 is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

Table 5
Illumination Readings
National Guard Armory
Georgetown, Delaware
Date of Sampling: 27 June 2003

Location	Luminance (fc)[a]	Standard (fc)[a]	Standard Met
SGT Orcutt's Office	75.1-101.7	70	Yes
SGT Blackman's Office	81.1-102.7	70	Yes
Hallway	15.5-114.4	7.5	Yes
Chaplain's Office	112.7-164.4	70	Yes
Kitchen	79.6-112.1	70	Yes
Dining Area	21.1-127.5	30	Some Areas
Maintenance Bay (Storage)	32.2-47.4	15	Yes
Stairwell	5.6-31.1	7.5	Some Areas
Drill Floor	9.1-257.9	70	Some Areas
Women's Latrine	10.0-65.6	40	Some Areas
Classroom	42.8-83.5	70	Some Areas
MAJ Miller's Office	77.1-125.4	70	Yes
SFC Adkin's Office	55.5-120.2	70	Some Areas

[a] fc - Footcandles

The readings were taken with a Cooke Corporation cal-LIGHT 400 Calibrated Precision Lightmeter, calibrated on 19 Aug 2002.

The standards listed above are from Design Guide DG-415-2, Logistics Facilities, published by the National Guard Bureau Installation Division.

Industrial Hygiene Survey Report

National Guard Facility
Georgetown Readiness Center

Prepared For:	**National Guard Bureau Region North IH** **301-IH Old Bay Lane** **Havre de Grace, MD 21078**
Survey Location:	**Georgetown Readiness Center** **109 West Pine Street** **Georgetown, DE 19947**
Prepared By:	**ALS Environmental** **3544 North Progress Avenue** **Suite 100** **Harrisburg, PA 17110**
Survey Date:	**October 13, 2011**
Report Date:	**December 5, 2011**
ALS Project #:	**1110756**

Non-Responsive

Director, Industrial Hygiene Services

Table of Contents

Section 1.0 Executive Summary

An industrial hygiene survey was conducted on October 13, 2011, at the Georgetown Readiness Center located at 109 West Pine Street, Georgetown, DE 19947. The survey was performed by Ms. Non-Responsive

1. Lead surface and air samples were collected. Surface levels of lead exceeded 200 micrograms per square foot (ug/ft^2) in four locations. Cleaning procedures should be improved and remedial action should be taken to maintain lead levels below 200 ug/ft^2. See Section 3.0 for sampling results.

2. Lighting levels did not meet the American National Standard Institute/Illuminating Engineering Society of North America (ANSI/IESNA) recommended guideline in some areas. See Section 4.0 for locations.

3. Indoor air quality (IAQ) parameters of temperature, relative humidity, carbon monoxide and carbon dioxide (ventilation) were evaluated during the assessment. Relative humidity levels in some areas were above The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation and Recommendation. See Section 5.0 for locations. Relative humidity should be maintained at 30 - 60%. The heating, ventilating, and air conditioning system (HVAC) system should be inspected to ensure it is working properly.

4. Some water damaged ceiling tiles were observed throughout the facility. Efflorescence was noted on the exterior wall in room 19. Identify and repair all sources of water infiltration. Remove and replace all water stained ceiling tiles.

5. The HVAC supply grills located in some of the offices and classrooms were observed to be dirty. These should be cleaned. Do not permit dirt, debris, microbial growth, etc. to accumulate in any portion of the HVAC system.

Section 2.0 Operation Description & Observations

The Georgetown Readiness Center is mainly an administrative facility with a drill hall, offices, classrooms, a garage and storage areas. There were approximately 10 full-time employees stationed at this facility at the time of this survey.

The building was initially constructed in 1940. There have been some renovations since its construction. The building is two stories with a brick exterior. The interior walls are concrete block or plaster. The floors are concrete with vinyl floor tile or carpet.

There is also a storage building located on the property. The storage building stores items used during deployments. The garage is also used for storage of maintenance equipment (e.g., lawn mowers). The garage does not have a local exhaust ventilation system. A ventilation survey was not performed. Workers performing tasks in the garage wear hearing and eye protection. No safety hazards were observed in the garage.

There is a central HVAC system present in the facility. HVAC units service the building via a boiler. Some offices have air conditioning window units. It was reported that the drill hall does not have a HVAC system.

The firing range was converted into a storage area. There was a section of the exhaust duct that remains but it is scheduled for removal on 10/18/2011. No other firing range components remain. The area appears very clean and well kept.

There is no child-care facility in the building.

Overall housekeeping practices were good. Areas were clean and well kept.

No ergonomic concerns were reported. Office areas have computer work stations. Work stations appeared properly designed. Personnel had supportive chairs.

Section 3.0 Lead Testing

Due to the age of the building there is the potential for lead based paint to be present. Various surfaces within the facility were screened for lead using surface/wipe samples. Surface/wipe samples were collected in accordance with the American Society for Testing and Materials (ASTM) E 1792 protocols. Air samples were collected using 0.8 um mixed cellulose ester (MCE) filter cassettes attached to low volume air sampling pumps. Blank samples were submitted to the laboratory for quality control purposes. Samples were sent to AMA Analytical Services, Inc., in Lanham, Maryland, for lead analysis using Environmental Protection Agency (EPA) Method 600/R-93/200 (M)-7420. A copy of the laboratory analysis report can be found in Appendix A.

Lead Testing Results Summary

Sample #	Location	Air ug/m^3	Surface ug/ft^2
1	Drill Hall	<5.7	*
2	Dining Hall	<5.6	*
3	Blank	<3 (ug)	*
4	**Drill Hall – Top of Lockers**	*	**240**
5	Drill Hall – Floor by Lockers	*	<110
6	Drill Hall – SRG Non-Responsive Office – Supply Grill	*	<110
7	Drill Hall – Window Sill	*	<110
8	Drill Hall – Kitchen Top Of Refrigerator	*	150
9	Converted Indoor Firing Range – Stored Item - Shipping Containers	*	<110
10	**Converted Indoor Firing Range – Floor**	*	**2,900**
11	**Converted Indoor Firing Range – Light Fixture**	*	**8,800**
12	**Converted Indoor Firing Range – Overhead Heater**	*	**800**
13	Outside Converted Firing Range – Hallway Floor	*	<110
14	S1 Office – File Cabinet	*	<110
15	Room 19 – Top of Locker	*	<110
16	Room 25 – Floor	*	<110
17	Blank	*	<12 (ug)

Key: **Bolded** results exceed listed criteria

Source: NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges

The National Guard Bureau currently utilizes 200 ug/ft^2 as a benchmark for identifying lead-contaminated surfaces. This guideline is referenced in NG PAM 420-15 "Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges" as a satisfactory surface contamination level unless the facility is utilized as a childcare facility. In such cases, U.S. Department of Housing and Urban Development (HUD)

limit of 40 ug/ft^2 on floors and 250 ug/ft^2 on windowsills should be observed. There is no child care provided at this facility.

Lead surface and air samples were collected.

- Surface levels of lead were at or above the recommended guideline of 200 ug/ft^2 in the following locations:

    - Drill Hall – Top of Lockers
    - Converted Indoor Firing Range – Floor
    - Converted Indoor Firing Range – Light Fixture
    - Converted Indoor Firing Range – Overhead Heater

    Cleaning procedures should be improved to maintain lead levels on surfaces below the recommended guideline of 200 ug/ft^2.

- Air samples for lead were below the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit of 50 ug/m^3.

- Paint was observed to be in good condition throughout the facility.

Section 4.0 Lighting

A lighting assessment was conducted throughout the facility. Measurements were collected using a Cooke Cal-Light 400L Precision Light Meter (Serial No. K070155). The light meter was last calibrated on September 10, 2011. Measurements collected were compared to ANSI/IESNA RP-7-01 Lighting Industrial Facilities and RP-1-04 Office Lighting.

Light Survey Assessment Summary

Location	Foot Candles (FC)	Recommended Lighting (FC)	Sufficient Lighting
S1- Office	97.7	30-50	Yes
Woman's Latrine	**2.7**	**5**	**No**
Drill Hall	10.1	10	Yes
Room 4 (Classroom)	71.8	30-50	Yes
Room 3 (Office)	75.3	30-50	Yes
Room 1 (Office)	107.7	30-50	Yes
Kitchen	92.6	50	Yes
Room 16 (Office)	75.3	30-50	Yes
Room 17 (Office)	91.2	30-50	Yes
Room 18 (Office)	120.5	30-50	Yes
Room 19 (Office)	51.1	30-50	Yes
Room 20 (Office)	115.9	30-50	Yes
Room 21 (Office)	106.8	30-50	Yes
Exercise Room	**26.8**	**30**	**No**
Dining Hall	120.8	10	Yes
Maintenance Office	**27.2**	**30-50**	**No**
Recruiting Office	75.1	30-50	Yes
Supply Office	64.1	30-50	Yes
Supply Room	75.3	30	Yes
NBC Supply Room	32.3	30	Yes
Motor Section (Office)	90.8	30-50	Yes
Storage Building	**24.6**	**30**	**No**

Bolded results did not meet listed criteria

Source: ANSI/IESNA RP-7-01 Lighting Industrial Facilities and RP-1-04 Office Lighting.

The lighting level did not meet the minimum recommended guideline in the following areas:

- Woman's Latrine
- Exercise Room
- Maintenance Office
- Storage Building

Lighting should be improved in these areas.

Section 5.0 Indoor Air Quality

Survey measurements were made for ventilation and comfort parameters (carbon dioxide, temperature, carbon monoxide and relative humidity). The air quality measurements were collected using direct reading instrumentation for comfort parameters using a QTRAK IAQ Meter, Model 7565 (Serial #7565X0839017). The IAQ Meter was last calibrated in February 11, 2011.

The American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) have developed indoor air quality guidelines for mechanically ventilated office buildings and commercial settings (ASHRAE standard 62.1-2010). ASHRAE specifies temperature and relative humidity ranges for human comfort (ASHRAE 55-2010). The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation, recommends maintaining a relative humidity range between 30 to 60% in occupied areas.

The following table summarizes the measurements collected.

IAQ Assessment Summary

Location	Temperature (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)
S1- Office	72.9	**71.7**	620	0.8
Drill Hall	74.4	**65.1**	668	1.1
Room 4 (Classroom)	74.4	**64.3**	598	0.7
Room 3 (Office)	73.2	51.0	587	0.8
Room 1 (Office)	73.1	57.6	626	0.9
Kitchen	73.3	**72.2**	405	1.1
Room 16 (Office)	73.4	**68.1**	408	1.0
Room 17(Office)	71.9	55.1	435	0.5
Room 18 (Office)	72.0	57.5	646	0.6
Room 19 (Office)	71.8	**64.7**	478	0.7
Room 20 (Office)	71.5	57.9	477	0.7
Room 21(Office)	71.3	56.4	546	0.5
Exercise Room	71.9	**66.4**	782	0.7
Dining Hall	72.5	**74.1**	640	1.0
Maintenance Office	73.3	**83.4**	403	0.4
Recruiting Office	74.3	**70.4**	692	0.4
Supply Office	73.2	**61.1**	419	0.2
Supply Room	73.6	**67.5**	435	0.5
NBC Supply Room	73.8	**67.9**	429	0.4
Motor Section (Office)	74.4	**68.1**	402	0.2
Storage Building	78.9	**68.1**	406	0.7
Outdoors	81.1	70.6	469	0.3
Criteria	**68.0-79.0**	**30-60**	**<1,169**	**<9.0**

Key: **Bolded** results exceed listed criteria

Source: The American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) 55-2010 & The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation.

Summary of findings and recommendations:

- Relative humidity was above the recommended criteria of 30-60% in most areas. High relative humidity can provide an environment suitable for microbial growth and proliferation. Maintain relative humidity levels between 30-60%.

- Carbon dioxide levels did not exceed the recommended ceiling of 1,169 parts per million (ppm). This indicates that outdoor air ventilation is adequate in all areas.

- Carbon monoxide levels were less than the recommended ceiling of 9 ppm.

- A visual inspection was conducted throughout visually accessible portions of the facility. The visual inspection was conducted to assess sources or pathways of factors potentially deleterious to IAQ. Some water damaged ceiling tile was observed throughout the facility. Efflorescence was observed on the exterior wall in room 19. Identify and repair the source of the water infiltration. Replace any water stained ceiling tiles.

- The HVAC supply grills located in some of the offices/classrooms were observed to be dirty. These should be cleaned. Do not permit dirt, debris, microbial growth, etc. to accumulate in any portion of the HVAC system.

Section 6.0 Suspect Asbestos Containing Building Materials

Based on the age of the building (e.g., constructed in 1940) asbestos-containing materials (ACM) could be present in the facility. It was reported that all known asbestos-containing material was abated. No suspect ACM was observed at the time of this survey. Inaccessible areas such as behind walls or crawlspaces were not inspected.

Section 7.0 Limitations

This report summarizes our evaluation of the conditions observed at the above referenced location. Our findings are based upon our observations and sampling results obtained at the facility at the time of our visit. The report, results, and subsequent recommendations reported herein are also limited to the information available at the time it was prepared and investigated. Conditions may have been in effect prior to the sampling events that have changed over time and which cannot be predicted within the scope of this limited investigation. Any conditions discovered which deviate from the data contained in this report should be presented to us for our evaluation.

This report is intended for the exclusive use of the client. This report and the findings herein shall not, in whole or in part, be relied upon by any other parties, disseminated or conveyed to any other party without prior written consent of the National Guard Bureau, and ALS Environmental. The findings are relative to the dates of our site visits and should not be relied upon for substantially later dates.

Appendix A. Laboratory Analysis Report

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY

LAP #100470

Client:	National Guard Bureau	**Job Name:**	RC-Georgetown	**Chain Of Custody:**	511595
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Georgetown, DE	**Date Submitted:**	10/19/2011
	Havre de Grace, Maryland 21078	**Job Number:**	RC-Georgetown	**Person Submitting:**	[redacted]
		P.O. Number:	NGB-IHNE	**Date Analyzed:**	10/24/2011 **Report Date:** 10/26/2011

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Total ug	Final Result		Comments
12006852	1110756-1	Flame	Air	528	N/A	5.7	ug/m³	<3	<5.7	ug/m³	
12006853	1110756-2	Flame	Air	533	N/A	5.6	ug/m³	<3	<5.6	ug/m³	
12006854	1110756-3	Flame	Air Blank	0	N/A	3	ug/m³		<3	ug	
12006855	1110756-4	Flame	Wipe	****	0.108	110	ug/ft²	26	240	ug/ft²	
12006856	1110756-5	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12006857	1110756-6	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12006858	1110756-7	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12006859	1110756-8	Flame	Wipe	****	0.108	110	ug/ft²	16	150	ug/ft²	
12006860	1110756-9	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12006861	1110756-10	Flame	Wipe	****	0.108	110	ug/ft²	310	2900	ug/ft²	
12006862	1110756-11	Flame	Wipe	****	0.108	110	ug/ft²	950	8800	ug/ft²	
12006863	1110756-12	Flame	Wipe	****	0.108	110	ug/ft²	86	800	ug/ft²	
12006864	1110756-13	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12006865	1110756-14	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12006866	1110756-15	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12006867	1110756-16	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12006868	1110756-17	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY

LAB #100470

Client:	National Guard Bureau	**Job Name:**	RC-Georgetown	**Chain Of Custody:**	511595
Address:	301-JH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Georgetown, DE	**Date Submitted:**	10/19/2011
	Havre de Grace, Maryland 21078	**Job Number:**	RC-Georgetown	**Person Submitting:**	[redacted]
		P.O. Number:	NGB-IHNE	**Date Analyzed:**	10/24/2011 **Report Date:** 10/26/2011

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)

%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.

Analyst: [redacted] **Technical Manager:** [redacted]

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA #100470) NVLAP#101143-0) NY ELAP #10920
1475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

Please Refer To This Number For Inquiries: **511595**

pg 1/2

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-JH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: RC-Georgetown
2. Job Location: Georgetown, DE
3. Job #: RC-Georgetown P.O. #: W912KR-09-A-0001, NGB-JHNE
4. Contact Person: [redacted]
5. Submitted by: [redacted]

Reporting Information (Results will be provided as soon as technically feasible):

RUSH HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due: ____	☐ Immediate ☐ 3 Day	☒ Include [redacted] with Report
☐ 24 Hours Time Due: ____	☐ Next Day ☒ 5 Day +	☒ Email: [redacted]@aasglobal.com
Comments: ____	☐ 2 Day Date Due: 10/26/11	☐ Fax: [redacted]
	☐ Results Required By Noon (If very Attempt Will Be Made to Accomplish)	☐ Verbal: [redacted]

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 ____ (QTY)
☐ Fiberglass ____ (QTY)
TEM Air – Please Indicate Filter Type:
☐ AHERA ____ (QTY)
☐ NIOSH 7402 ____ (QTY)
☐ Other (specify: ____) ____ (QTY)
PLM Bulk
☐ EPA 600 – Visual Estimate ____ (QTY)
☐ EPA Point Count ____ (QTY)
☐ NY State Friable 198.1 ____ (QTY)
☐ Gravimetric Reduction ELAP 198.6 ____ (QTY)
☐ Other (Specify ____) ____ (QTY)
Misc
☐ Vermiculite
☐ Asbestos Soil PLM ___ (Qual) TEM ___ (Qual) TEM TEM ___ (Qual) PLM TEM ___ (Qual)

TEM Bulk
☐ ELAP 198.4/CBatfield ____ (QTY)
☐ NY State PLM/TEM ____ (QTY)
☐ Residual Ash ____ (QTY)
TEM Dust
☐ Qual. (prec/abs) Vacuum/Qual: ____ (QTY)
☐ Quant. (s/area) Vacuum D5755-95 ____ (QTY)
☐ Quant. (s/area) Wipe D6480-99 ____ (QTY)
TEM Water
☐ Qual. (prec/abs) ____ (QTY)
☐ ELAP 198.2/EPA 100.2 ____ (QTY)
☐ EPA 100.1 ____ (QTY)

☒ All samples received in good condition unless otherwise noted. (TEM Water samples ____ °C)

Metals Analysis
☐ Pb Paint Chip ____ (QTY)
☒ Pb Dust Wipe (swipe type: Ghost) 14 (QTY)
☒ Pb Air 3 (QTY)
☐ Pb Soil/Solid ____ (QTY)
☐ Pb TCLP ____ (QTY)
☐ Drinking Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
☐ Waste Water ☐ Pb ____ (QTY) ☐ Cu ____ (QTY) ☐ As ____ (QTY)
☐ Pb Furnace (Media: ____) ____ (QTY)
Fungal Analysis
Collection Apparatus for Spore Trap/Air Samples: ____
Collection Media: ____
☐ Spore-Trap ____ (QTY) ☐ Surface Vacuum Dust ____ (QTY)
☐ Surface Swab ____ (QTY) ☐ Culturable ID Genus (Media ____) ____ (QTY)
☐ Surface Tape ____ (QTY) ☐ Culturable ID Species (Media ____) ____ (QTY)
☐ Other (Specify ____) ____ (QTY)

CLIENT ID NUMBER	SAMPLE LOCATION IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	SOIL	PAINT	LEAD	MOLD	AIR	BULK	MATRIX: DUST	WATER (DRINK)	WATER (WASTE)	TCLP	SOIL
111075to-1		10/13	538					X		X						
111075to-2		"	533					X		X						
111075to-3		"	0					X		X						
111075to-4		"	"	100cm²				X				X				
111075to-5		"	"	"				X				X				
111075to-6		"	"	"				X				X				
111075to-7		"	"	"				X				X				
111075to-8		"	"	"				X				X				
111075to-9		"	"	"				X				X				
111075to-10		"	"	"				X				X				
111075to-11		"	"	"				X				X				
111075to-12		"	"	"				X				X				

CLIENT CONTACT
(LABORATORY STAFF ONLY)
Date/Time: ____ Contact: ____ By: ____
Date/Time: ____ Contact: ____ By: ____
Date/Time: ____ Contact: ____ By: ____

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: 10/19/11 @ 915 Via: DPS By (Print): [redacted] Sign: [redacted]
2. Date/Time Analyzed: ____/____/____ @ ____ By (Print): ____ Sign: ____
3. Results Reported To: ____ Via: ____ Date: ____/____/____ Time: ____ Initials: ____
4. Comments: 12 X17 395 03 4087 7071

NL

Page 2 of 2

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100170) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquiries) 511595
page 2/2

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-H Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: RC - Georgetown
2. Job Location:
3. Job #: [redacted] P.O. #: W912K6-09-A-0003
4. Contact Person [redacted] Cell phone #: (410) 942-0273
5. Submitted by: [redacted] Signature:

Reporting Information (Results will be provided as soon as technically feasible):

AFTER-HOURS (must be pre-scheduled): ☐ Immediate ☐ 24 Hours Date Due: Time Due: Comments:

NORMAL BUSINESS HOURS: ☐ Immediate ☐ Next Day ☐ 2 Day ☐ 3 Day ☒ 5 Day + Date Due: ☐ Results Required By Noon (Every Attempt Will Be Made to Accommodate)

REPORT TO: ☒ Include COC/Field Data Sheets with Report ☒ E-mail: [redacted] @us.army.mil ☐ Fax: @us.army.mil ☐ Verbal

Asbestos Analysis
PCM Air – Please Indicate Filter Type: ☐ NIOSH 7400 ____ (QTY) ☐ Fiberglass ____ (QTY)
TEM Air – Please Indicate Filter Type: ☐ AHERA ____ (QTY) ☐ NIOSH 7402 ____ (QTY) ☐ Other (specify ____) ____ (QTY)
PLM Bulk: ☐ EPA 600 – Visual Estimate ____ (QTY) ☐ EPA Point Count ____ (QTY) ☐ NY State Friable 198.1 ____ (QTY) ☐ Grav. Reduction ELAP 198.6 ____ (QTY) ☐ Other (specify ____) ____ (QTY)
MISC: ☐ Vermiculite ☐ Asbestos Soil PLM ___ (Qual PLM ___ (Quant TEM/TEM ___ (Qual PLM/TEM ___ (Quant)

TEM Bulk: ☐ ELAP 198.4 (Chatfield ____ (QTY) ☐ NY State PLM/TEM ____ (QTY) ☐ Residual Ash ____ (QTY)
TEM Dust: ☐ Qual. (presabs) Vacuum/Dust ____ (QTY) ☐ Quant. (s/area) Vacuum D5755-95 ____ (QTY) ☐ Quant. (s/area) Dust D6480-99 ____ (QTY)
TEM Water: ☐ Qual. (pres/abs) ____ (QTY) ☐ ELAP 198.2/EPA 100.2 ____ (QTY) ☐ EPA 100.1 ____ (QTY)
☐ All samples received in good condition unless otherwise noted. (TEM Water samples ____ °C)

Metals Analysis
☐ Pb Paint Chip ____ (QTY) ☐ Pb Dust Wipe (wipe type ____) ____ (QTY) ☐ Pb Air ____ (QTY) ☐ Pb Soil/Solid ____ (QTY) ☐ Pb TCLP ____ (QTY) ☐ Drinking Water ☐ Pb ___ (QTY) ☐ Cu ___ (QTY) ☐ As ___ (QTY) ☐ Waste Water ☐ Pb ___ (QTY) ☐ Cu ___ (QTY) ☐ As ___ (QTY) ☐ Pb Furnace (Media ____) ____ (QTY)
Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples: ____ Collection Media ____
☐ Spore-Trap ____ (QTY) ☐ Surface Swab ____ (QTY) ☐ Surface Tape ____ (QTY) ☐ Other (Specify ____) ____ (QTY) ☐ Surface Vacuum Dust ____ (QTY) ☐ Culturable ID Genus (Media ____) ____ (QTY) ☐ Culturable ID Species (Media ____) ____ (QTY)

SAMPLE INFORMATION / ANALYSIS / MATRIX

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	...	...	DUST	...	...	TAPE	SWAB
1110756-13		10/13		100cm²				X				X				
1110756-14		↓		↓				X				X				
1110756-15								X				X				
1110756-16								X				X				
1110756-17		↓		0cm²				X				X				

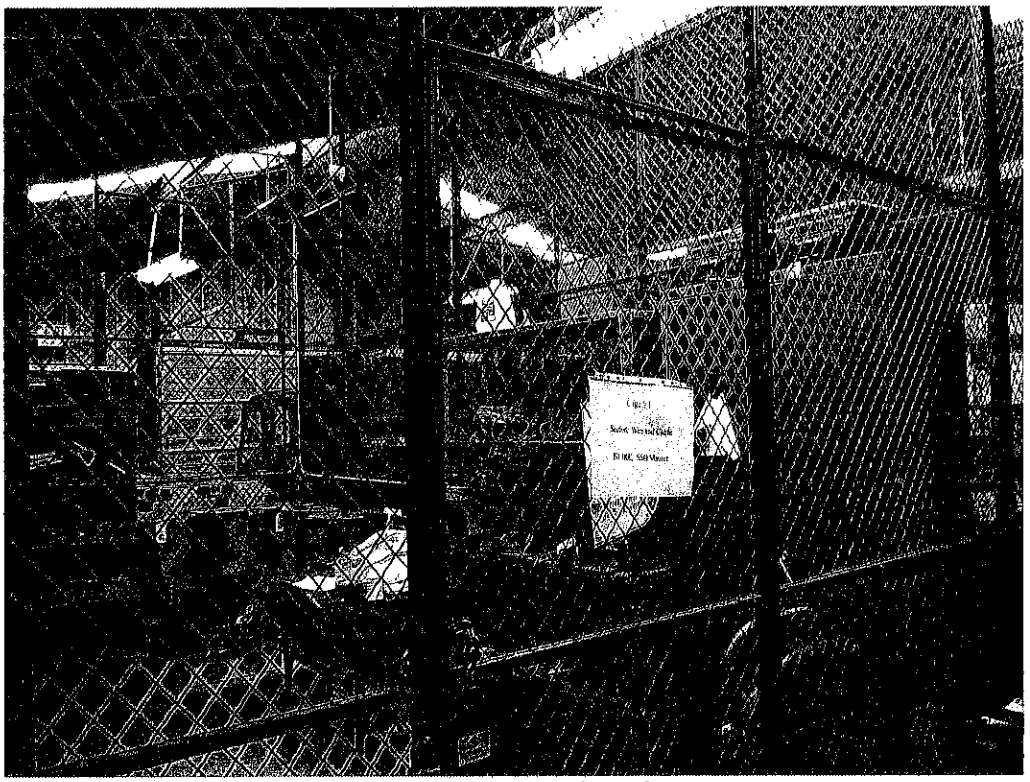
CLIENT CONTACT (LABORATORY STAFF ONLY):
Date/Time: Contact: By:
Date/Time: Contact: By:
Date/Time: Contact: By: [redacted]

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: / / @ Via: By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments:

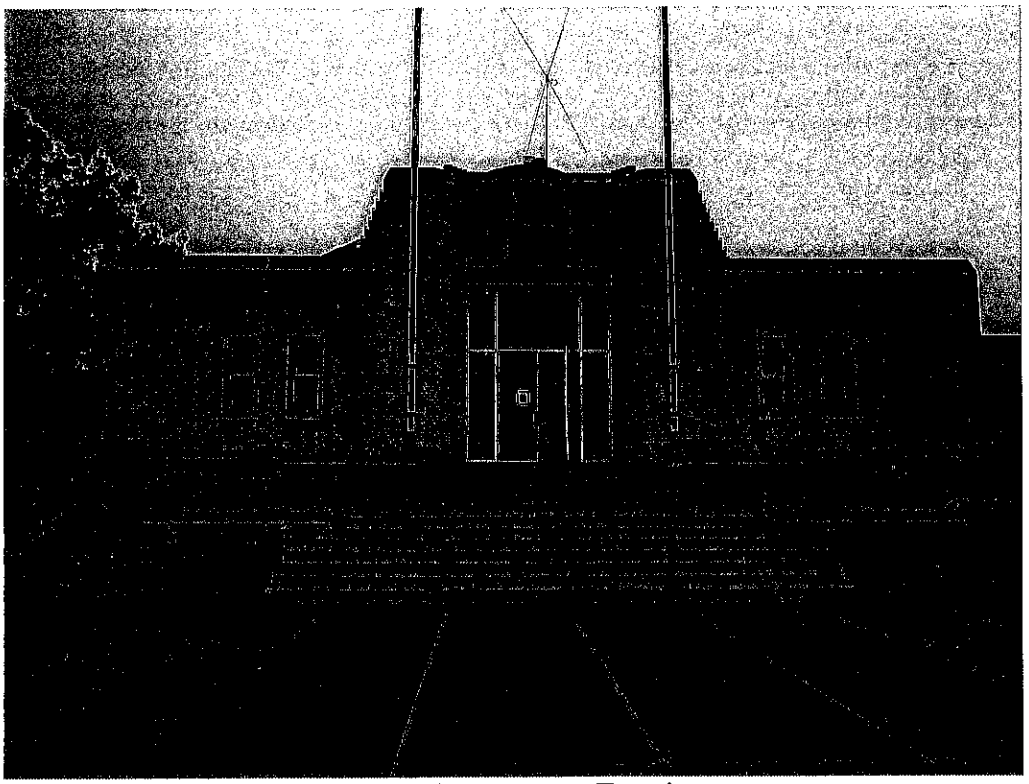
BEST AVAILABLE COPY

Appendix B. Photographs

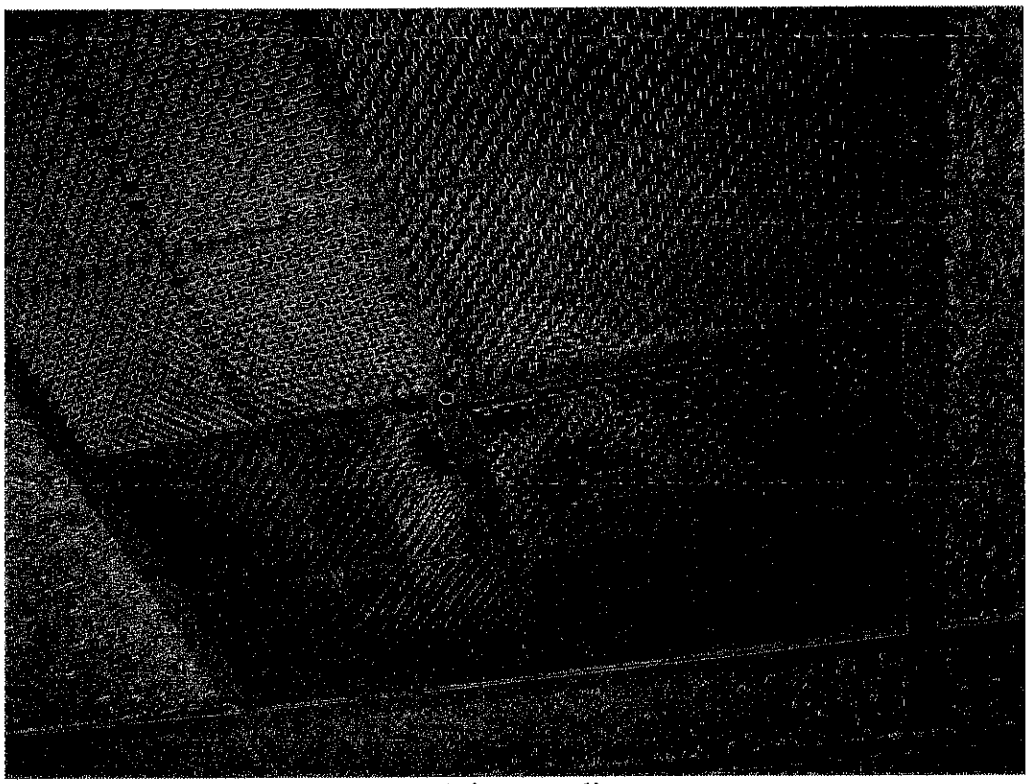
RC Georgetown- Garage



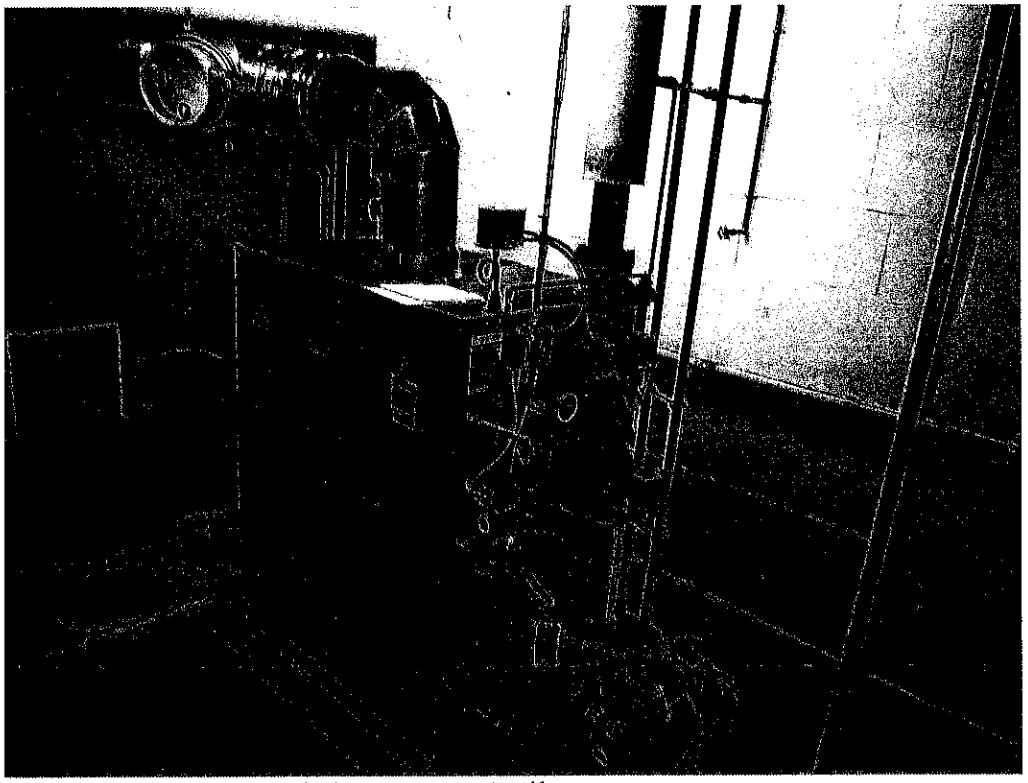
RC Georgetown- Interior of garage



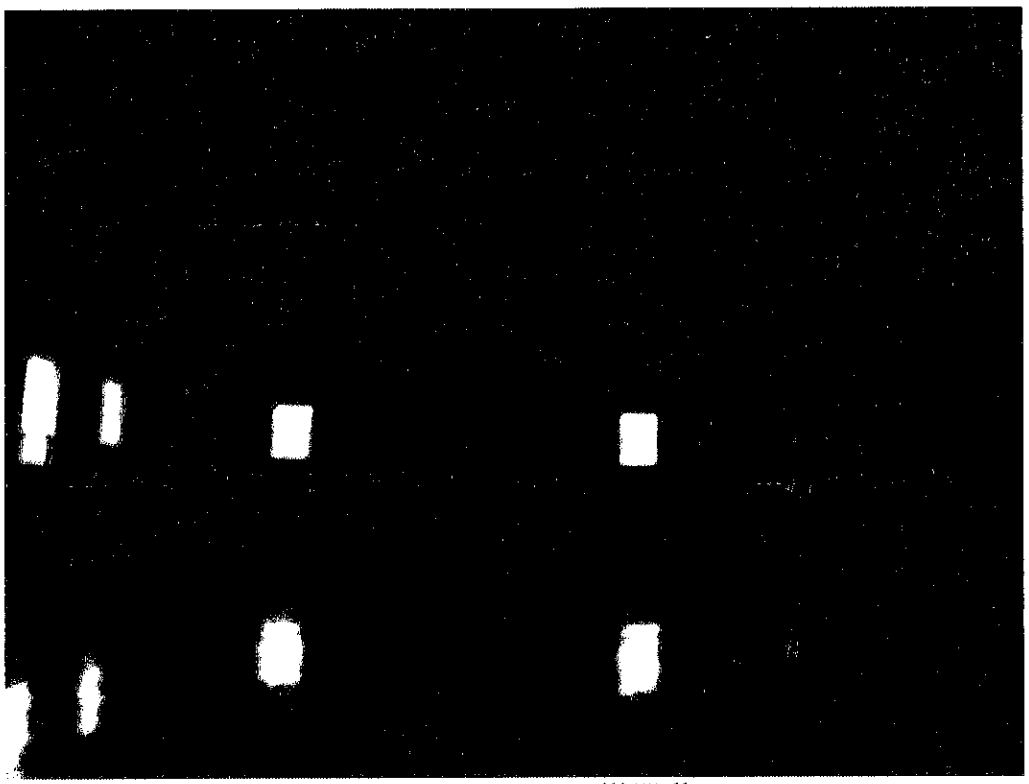
RC Georgetown- Exterior



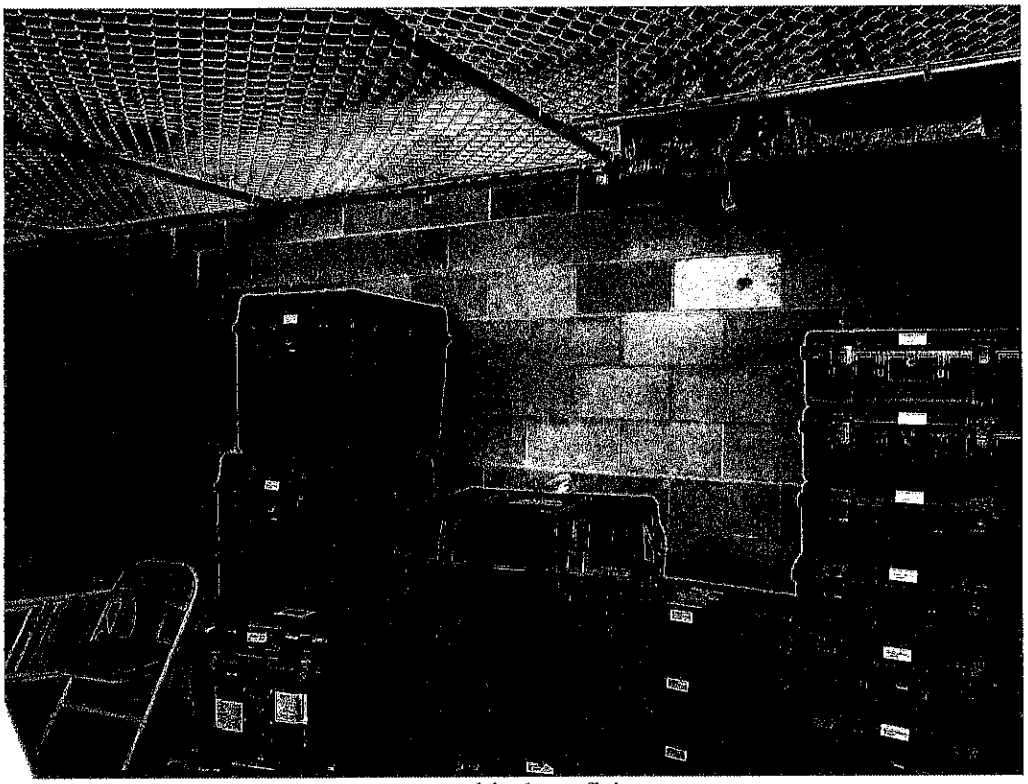
RC Georgetown- Dirty supplies



RC Georgetown- Boiler

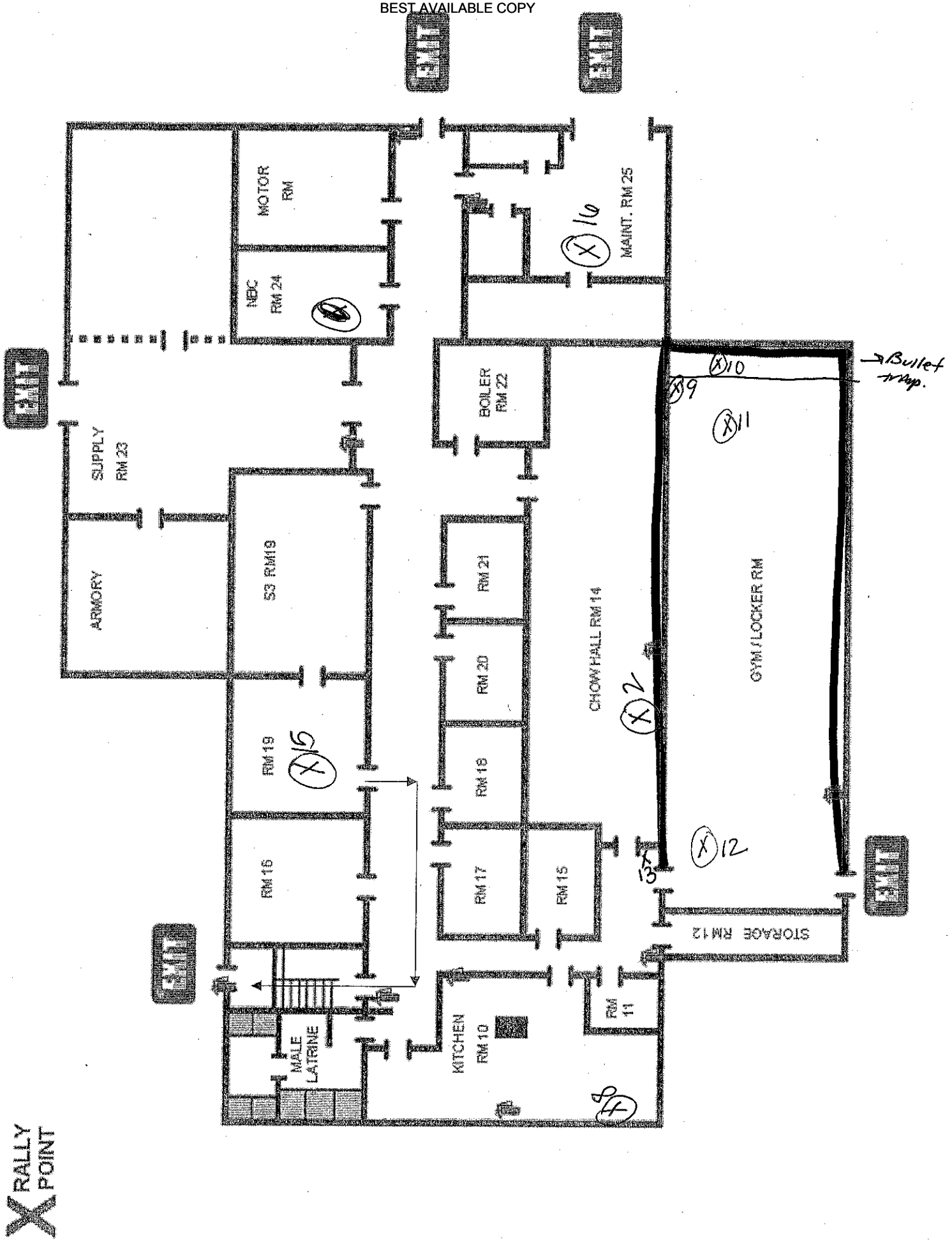


RC Georgetown- Drill Hall



RC Georgetown- Converted indoor firing range

Appendix C. Floor Plan



Appendix D. References

1. Title 29 Code of Federal Regulations (CFR), Part 1910.1025, Occupational Safety and Health Administration, Occupational Exposure to Lead

2. American Conference of Governmental Industrial Hygienists (ACGIH) – Threshold Limit Values and Biological Exposure Indices, 2011 Edition

3. Industrial Ventilation: A Manual of Recommended Practice for Design, 27th Edition

4. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Ventilation for Acceptable Indoor Air Quality, 62.1-2010

5. RP-1-2004, Industrial Lighting, Illuminating Engineering Society of North America/ANSI

6. RP-7-2001, Industrial Lighting, Illuminating Engineering Society of North America/ANSI

7. National Emission Standard Hazardous Air Pollutants (NESHAP) – The standards for asbestos are contained in 40 CFR 61.140 through 61.157.

8. Environmental Protection Agency (EPA) standards [40 Code of Federal Regulations (CFR) 745.227(h)(3)]

9. Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM)

10. The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation, February 2002.

11. NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 NOV 06.

12. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Thermal Environmental Conditions for Human Occupancy, 55-2010.

COMPLIANCE MANAGEMENT INTERNATIONAL

1215 Manor Drive, Suite 205
Mechanicsburg, PA 17055
Phone: 717.590.7031
Fax: 717.590.7936
www.complianceplace.com

Industrial Hygiene Survey Report

National Guard Facility
Georgetown Readiness Center

Prepared For:	**National Guard Bureau Region North IH** **301-IH Old Bay Lane** **Havre de Grace, MD 21078**
Survey Location:	**Georgetown Readiness Center** **109 West Pine Street** **Georgetown, DE 19947**
Prepared By:	**Compliance Management International** **1215 Manor Drive** **Suite 205** **Mechanicsburg, PA 17055**
Survey Date:	**November 14, 2012**
Report Date:	**December 27, 2012**

[redacted]
Non-Responsive

Senior Industrial Hygienist

Table of Contents

Section 1.0 Executive Summary

An industrial hygiene survey was conducted on November 14, 2012, at the Georgetown Readiness Center located at 109 West Pine Street, Georgetown, DE 19947. The survey was performed by Mr. Non-Responsive.

1. Lead surface and air samples were collected. Surface levels of lead exceeded 200 micrograms per square foot (ug/ft^2) in three locations. Cleaning procedures should be improved and remedial action should be taken to maintain lead levels below 200 ug/ft^2. See Section 3.0 for sampling results.

2. Lighting levels did not meet the American National Standard Institute/Illuminating Engineering Society of North America (ANSI/IESNA) recommended guideline in the Garage. See Section 4.0 for detailed findings.

3. Indoor air quality (IAQ) parameters of temperature, relative humidity, carbon monoxide and carbon dioxide (ventilation) were within recommended guidelines during this survey.

4. Several conditions or factors that could affect indoor air quality were observed at the time of this survey. This includes:

    a. Roof leaks and sources of water infiltration;
    b. Poor housekeeping;
    c. Dirty supply and return vents.

Section 2.0 Operation Description & Observations

The Georgetown Readiness Center is mainly an administrative facility with a drill hall, offices, classrooms, a garage and storage areas. There were approximately 10 full-time employees stationed at this facility at the time of this survey.

The building was initially constructed in 1940. There have been some renovations since its construction. The building is two stories with a brick exterior. The interior walls are concrete block or plaster. The floors are concrete with vinyl floor tile or carpet.

There is a storage/garage building located on the property. This building is used mainly to stores items used during deployments and maintenance equipment (e.g., lawn mowers). Minor tasks such as changing a tire or light can periodically be done in the garage area. The garage does not have a local exhaust ventilation system. Workers performing tasks in the garage wear hearing and eye protection. No safety hazards were observed in the garage.

There is a central Heating, Ventilation, and Air-Conditioning (HVAC) system present in the facility. HVAC units service the building via a boiler. Some offices have air conditioning window units. It was reported that the drill hall does not have a HVAC system.

The firing range has been converted into a storage area. Due to previous high surface lead sample results the area is posted as a lead hazard area.

There is no child-care facility in the building.

Overall housekeeping practices were poor. Housekeeping needs improved.

No ergonomic concerns were reported. Office areas have computer work stations. Work stations appeared properly designed. Personnel had supportive chairs.

Section 3.0 Lead Testing

Due to the age of the building there is the potential for lead based paint to be present. Various surfaces within the facility were screened for lead using surface/wipe samples. Surface/wipe samples were collected in accordance with the American Society for Testing and Materials (ASTM) E 1792 protocols. Air samples were collected using 0.8 um mixed cellulose ester (MCE) filter cassettes attached to low volume air sampling pumps. Blank samples were submitted to the laboratory for quality control purposes. Samples were sent to AMA Analytical Services, Inc., in Lanham, Maryland, for lead analysis using Environmental Protection Agency (EPA) Method 600/R-93/200 (M)-7420. A copy of the laboratory analysis report can be found in Appendix A.

Lead Testing Results Summary

Sample #	Location	Bulk (%)	Air ug/m^3	Surface ug/ft^2
1	Drill Hall	*	<6.7	*
2	Converted Firing Range – Storage Area	*	<6.7	*
3	Drill Hall – Center of Floor	*	*	<110
4	Drill Hall – Top of Lockers	*	*	<110
5	Drill Hall – Top of Flag Stand	*	*	<110
6	Kitchen – Top of Mixer	*	*	<110
7	Kitchen – Top of Wall Locker	*	*	<110
8	**Hallway – Outside Converted Firing Range**	*	*	**230**
9	**Converted Indoor Firing Range – Floor**	*	*	**110,000**
10	Converted Indoor Firing Range – Top of Locker	*	*	130
11	**Converted Indoor Firing Range – Top of Shop Vac**	*	*	**6000**
12	Classroom – Top of Wall Lockers	*	*	<110
13	Dining Room – Top of Microwave	*	*	<110
14	[redacted] Office – Top of Desk	*	*	<110
15	Supply Office – Top of Desk	*	*	<110
16	Blank – Wipe	*	*	<12 ug
17	Blank – Air	*	<3 ug	*
18	Kitchen Pipes – Peeling Paint	0.0095	*	*
-	Criteria	0.5	50	200

Table Notes:

1. **Bolded** results exceed listed criteria
2. **ppm =** parts per million
3. **ug/ft^2 =** micrograms per square foot
4. **ug/m^3** = micrograms per cubic meter
5. **ug =** micrograms

Source: NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges
The National Guard Bureau currently utilizes 200 ug/ft^2 as a benchmark for identifying lead-contaminated surfaces. This guideline is referenced in NG PAM 420-15 "Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges" as a satisfactory surface contamination level unless the facility is utilized as a childcare facility. In such cases, U.S. Department of Housing and Urban Development (HUD) limit of 40 ug/ft^2 on floors and 250 ug/ft^2 on windowsills should be observed. There is no child care provided at this facility.

Lead bulk, surface and air samples were collected. The following is a summary of the sample results from this survey.

- Surface levels of lead were at or above the recommended guideline of 200 ug/ft^2 in the following locations:

    - Drill Hall – Top of Lockers
    - Converted Indoor Firing Range – Floor
    - Converted Indoor Firing Range – Light Fixture
    - Converted Indoor Firing Range – Overhead Heater

    Cleaning procedures should be improved to maintain lead levels on surfaces below the recommended guideline of 200 ug/ft^2.

- Air samples for lead were below the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit of 50 micrograms per cubic meter (ug/m^3).

- Paint was observed to be peeling in the kitchen on pipes. A bulk sample was collected and determined to contain 0.0095%Pb. This is less than the EPA definition of lead based paint = 0.5%. However, all areas of peeling paint should be repaired.

Section 4.0 Lighting

A lighting assessment was conducted throughout the facility. Measurements were collected using a Cooke Cal-Light 400L Precision Light Meter (Serial No. K98364). The light meter was last calibrated in April 2012. Measurements collected were compared to ANSI/IESNA RP-7-01 Lighting Industrial Facilities and RP-1-04 Office Lighting.

Light Survey Assessment Summary

Location	Foot Candles (FC)	Recommended Lighting (FC)	Sufficient Lighting
Conference Room	52.6	30-50	Yes
Classroom 4	90.8	30-50	Yes
Drill Hall	43.1	10	Yes
Kitchen	93.1	50	Yes
Converted Firing Range-Storage	43.1	30	Yes
Dining Room	87.7	10	Yes
Non-Responsive Office	106.5	30-50	Yes
Mechanical Room	50.6	30	Yes
Supply Room	85	30	Yes
Garage – Light Vehicle Maintenance	**67.8**	**75**	**No**

Table Notes:

1. FC = Foot Candles
2. **Bolded** results did not meet listed criteria

Source: ANSI/IESNA RP-7-01 Lighting Industrial Facilities and RP-1-04 Office Lighting.

The lighting level did not meet the minimum recommended guideline in the Garage Area. Lighting should be improved in these areas.

Section 5.0 Indoor Air Quality

Survey measurements were made for ventilation and comfort parameters (carbon dioxide, temperature, carbon monoxide and relative humidity). The air quality measurements were collected using direct reading instrumentation for comfort parameters using a QTRAK IAQ Meter, Model 7565 (Serial #02041015). The IAQ Meter was last calibrated in August 2012.

The American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) have developed indoor air quality guidelines for mechanically ventilated office buildings and commercial settings (ASHRAE standard 62.1-2010). ASHRAE specifies temperature and relative humidity ranges for human comfort (ASHRAE 55-2010). The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation, recommends maintaining a relative humidity range between 30 to 60%.

The following table summarizes the measurements collected.

IAQ Assessment Summary

Location	Temperature (◦F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)
Conference Room	70.3	34.3	467	2.8
Classroom 4	71.4	38.7	458	1.4
Drill Hall	70	38.6	465	2.0
Kitchen	74.1	40.1	511	2.1
Converted Firing Range-Storage	71.6	41.8	476	2.1
Dining Room	73.8	34.8	494	1.8
Non-Responsive Office	73	35.2	531	1.8
Mechanical Room	75.3	34.7	572	1.5
Supply Room	74.1	34.3	641	1.6
Garage	71.1	34.3	544	1.8
Outdoors	56.1	49.1	322	2.3
Criteria	**68.0-79.0**	**30-60**	**<1,022**	**<9.0**

Table Notes:

1. **Bolded** results exceed listed criteria
2. **ppm** = parts per million
3. **(%)** = percent relative humidity
4. **F** = degrees Fahrenheit

Source: The American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) 55-2010 & The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation.

Summary of findings and recommendations:

- Temperature and relative humidity measurements were within the recommended guidelines.

- Carbon dioxide levels measured did not exceed the recommended ceiling of 1,022 parts per million (ppm). This indicates that outdoor air ventilation is adequate in all areas.

- Carbon monoxide levels measured were less than the recommended ceiling of 9 ppm.

- A visual inspection was conducted throughout accessible portions of the facility to assess sources or pathways of factors potentially deleterious to IAQ. The following observations were noted:

    - Numerous roof leaks and associated water damaged ceiling tile were present. All sources of water infiltration should be identified and repaired. Water stained ceiling tile should be removed and replaced.
    - Overall housekeeping was poor. Housekeeping should be improved.
    - The HVAC supply grills located in some areas were dirty. These should be cleaned. Do not permit dirt, debris, microbial growth, etc. to accumulate in any portion of the HVAC system.

Section 6.0 Suspect Asbestos Containing Building Materials

Based on the age of the building (e.g., constructed in 1940) asbestos-containing materials (ACM) could be present in the facility. It was reported that all known asbestos-containing materials have been abated. No suspect ACM was observed at the time of this survey. Inaccessible areas such as behind walls or crawlspaces were not inspected.

Section 7.0 Equipment

The following equipment was utilized during this survey. All sampling equipment was properly calibrated prior to use and verified for accuracy as applicable. See daily reports and calibrations logs for detailed information.

Equipment	Serial #	Calibration Date	Value
TSI QTrak IAQ Meter	02041015	8/2012	NA
Cal Light 400 Light Meter	K98364	4/2012	NA
TSI 4199 Calibrator	41460827002	8/2012	NA
SKC Air Sampling Pump	647631	11/15/2012	2.49 LPM
SKC Air Sampling Pump	647610	11/15/2012	2.49 LPM

Section 8.0 Limitations

This report summarizes our evaluation of the conditions observed at the above referenced location. Our findings are based upon our observations and sampling results obtained at the facility at the time of our visit. The report, results, and subsequent recommendations reported herein are also limited to the information available at the time it was prepared and investigated. Conditions may have been in effect prior to the sampling events that have changed over time and which cannot be predicted within the scope of this limited investigation. Any conditions discovered which deviate from the data contained in this report should be presented to us for our evaluation.

This report is intended for the exclusive use of the client. This report and the findings herein shall not, in whole or in part, be relied upon by any other parties, disseminated or conveyed to any other party without prior written consent of the National Guard Bureau, and Compliance Management International, Inc. The findings are relative to the dates of our site visits and should not be relied upon for substantially later dates.

Appendix A. Laboratory Analysis Report

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Delware National Guard	**Chain Of Custody:**	514547		
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Georgetown RC	**Date Submitted:**	11/26/2012		
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/30/2012	**Report Date:**	11/30/2012
Attention:	Non-Responsive						

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit		Total ug	Final Result		Comments
13016661	1	Flame	Air	448	N/A	6.7	ug/m^3	<3	<6.7	ug/m^3	
13016662	2	Flame	Air	448	N/A	6.7	ug/m^3	<3	<6.7	ug/m^3	
13016663	3	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016664	4	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016665	5	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016666	6	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016667	7	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016668	8	Flame	Wipe	****	0.108	110	ug/ft^2	25	230	ug/ft^2	
13016669	9	Flame	Wipe	****	0.108	110	ug/ft^2	11000	110000	ug/ft^2	
13016670	10	Flame	Wipe	****	0.108	110	ug/ft^2	14	130	ug/ft^2	
13016671	11	Flame	Wipe	****	0.108	110	ug/ft^2	650	6000	ug/ft^2	
13016672	12	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016673	13	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016674	14	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016675	15	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13016676	16	Flame	Wipe Blank	****	N/A	12	ug		<12	ug	
13016677	17	Flame	Air Blank	0	N/A	3	ug/m^3		<3	ug	
13016678	18	Flame	Paint Chip	****	N/A	0.0095	%Pb		<0.0095	%Pb	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	Delware National Guard	**Chain Of Custody:**	514547
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Georgetown RC	**Date Submitted:**	11/26/2012
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/30/2012 **Report Date:** 11/30/2012
Attention:	Non-Responsive				

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft^2)	Reporting Limit	Total ug	Final Result	Comments

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7000B; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7010; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) on a dry weight basis mg/L = parts per million (ppm)

%Pb = percent lead on a dry weight basis ug = micrograms ug/L = parts per billion (ppb)

Note: All samples were received in good condition unless otherwise noted.

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Air and Wipe results are not corrected for any blank results

Final results for air and wipe samples are based on client supplied information nor verified by this laboratory.

All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.

See QC Summary for analytical results of quality control samples associated with these samples.

Analys Non-Responsive

Technical Manager: Non-Responsive

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 514547

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: Delaware National Guard
2. Job Location: Georgetown RC
3. Job #:
4. Contact Person [redacted] 942-0273
5. Submitted by: [redacted]

Reporting Information (Results will be provided a[redacted]

AFTER HOURS (must be pre-scheduled)
☐ Immediate Date Due:
☐ 24 Hours Time Due:
Comments:

NORMAL BUSINESS HOURS
☐ Immediate ☐ 3 Day
☐ Next Day ☒ 5 Day + Date Due: 12/3/12
☐ 2 Day
☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

REPORT TO:
☒ Incl[redacted] with Report
☒ Em[redacted] @ComplianceplAce.Com
☐ Fax[redacted] @us.army.mil
☐ Ver[redacted] @us.army.mil

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
☐ NIOSH 7400 (QTY)
☐ Fiberglass (QTY)
TEM Air – Please Indicate Filter Type:
☐ AHERA (QTY)
☐ NIOSH 7402 (QTY)
☐ Other (specify) (QTY)
PLM Bulk
☐ EPA 600 – Visual Estimate (QTY)
☐ EPA Point Count (QTY)
☐ NY State Friable 198.1 (QTY)
☐ Grav. Reduction ELAP 198.6 (QTY)
☐ Other (specify) (QTY)
MISC
☐ Vermiculite
☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

TEM Bulk
☐ ELAP 198.4/Chatfield (QTY)
☐ NY State PLM/TEM (QTY)
☐ Residual Ash (QTY)
TEM Dust
☐ Qual. (pres/abs) Vacuum/Dust (QTY)
☐ Quan. (s/area) Vacuum D5755-95 (QTY)
☐ Quan. (s/area)Dust D6480-99 (QTY)
TEM Water
☐ Qual. (pres/abs) (QTY)
☐ ELAP 198.2/EPA 100.2 (QTY)
☐ EPA 100.1 (QTY)

☒ All samples received in good condition unless otherwise noted. (TEM Water samples ____ °C)

Metals Analysis
☐ Pb Paint Chip 1 (QTY)
☐ Pb Dust Wipe (wipe type Ghost) 14 (QTY)
☐ Pb Air 3 (QTY)
☐ Pb Soil/Solid (QTY)
☐ Pb TCLP (QTY)
☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
☐ Pb Furnace (Media) (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
☐ Spore-Trap (QTY) ☐ Surface Vacuum Dust (QTY)
☐ Surface Swab (QTY) ☐ Culturable ID Genus (Media) (QTY)
☐ Surface Tape (QTY) ☐ Culturable ID Species (Media) (QTY)
☐ Other (Specify) (QTY)

	CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	MATRIX: AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
1	Drill Hall		11-19	448					X								
2	Converted	Firing Range		448					X								
3	Drill Hall floor				100 cm2				X								
4	Drill Hall locker								X								
5	Drill Hall Flag stand								X								
6	Kitchen - Mixer								X								
7	Kitchen - Locker								X								
8	Hallway outside of Range								X								
9	Range Converted Range floor								X								
10	Converted Range locker								X								
11	Converted Range - Shop Vac								X								
12	Classroom - Locker		↓	↓	↓	chng 6938			X								

CLIENT CONTACT (LABORATORY STAFF ONLY)
Date/Time: Contact: By:
Date/Time: Contact: By:
Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: 11/26/12 @ 1000 Via: FEDEX By (Pri[redacted]
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Initials:
4. Comments: 7939 3323 2839

[redacted]

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OWI (410) 247-2024

159202 210 REV. 6.08

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
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CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 514547
page 2 of 2

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-SI, State Military Reservation
4. Address 3: Havre de Grace, Maryland 21078
5. Phone #: (410) 942-0273 Fax #: (410) 942-0254

Submittal Information:
1. Job Name: Delaware National Guard
2. Job Location: Georgetown
3. Job #: [redacted]
4. Contact Perso[redacted]) 942-0273
5. Submitted by[redacted]

Reporting Information (Results will be provided [redacted]

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS			REPORT TO:
❑ Immediate Date Due: ____	❑ Immediate	❑ 3 Day	❑ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☒ Inclu[redacted]ith Report
❑ 24 Hours Time Due: ____	❑ Next Day	❑ 5 Day +		☒ [redacted] compliance place. com
Comments: ____	❑ 2 Day	Date Due: ____		❑ Fax:[redacted]@us.army.mil
				❑ Verb[redacted]@us.army.mil

Asbestos Analysis
PCM Air – Please Indicate Filter Type:
❑ NIOSH 7400 ____ (QTY)
❑ Fiberglass ____ (QTY)
TEM Air – Please Indicate Filter Type:
❑ AHERA ____ (QTY)
❑ NIOSH 7402 ____ (QTY)
❑ Other (specify ____) ____ (QTY)
PLM Bulk
❑ EPA 600 – Visual Estimate ____ (QTY)
❑ EPA Point Count ____ (QTY)
❑ NY State Friable 198.1 ____ (QTY)
❑ Grav. Reduction ELAP 198.6 ____ (QTY)
❑ Other (specify ____) ____ (QTY)
MISC
❑ Vermiculite
❑ Asbestos Soil PLM__(Qual) PLM__(Quan) PLM/TEM__(Qual) PLM/TEM__(Quan)

TEM Bulk
❑ ELAP 198.4/Chatfield ____ (QTY)
❑ NY State PLM/TEM ____ (QTY)
❑ Residual Ash ____ (QTY)
TEM Dust
❑ Qual. (pres/abs) Vacuum/Dust ____ (QTY)
❑ Quan. (s/area) Vacuum D5755-95 ____ (QTY)
❑ Quan. (s/area)Dust D6480-99 ____ (QTY)
TEM Water
❑ Qual. (pres/abs) ____ (QTY)
❑ ELAP 198.2/EPA 100.2 ____ (QTY)
❑ EPA 100.1 ____ (QTY)

❑ All samples received in good condition unless otherwise noted. (TEM Water samples ____ °C)

Metals Analysis
❑ Pb Paint Chip ____ (QTY)
❑ Pb Dust Wipe (wipe type ____) ____ (QTY)
❑ Pb Air ____ (QTY)
❑ Pb Soil/Solid ____ (QTY)
❑ Pb TCLP ____ (QTY)
❑ Drinking Water ❑ Pb ____ (QTY) ❑ Cu ____ (QTY) ❑ As ____ (QTY)
❑ Waste Water ❑ Pb ____ (QTY) ❑ Cu ____ (QTY) ❑ As ____ (QTY)
❑ Pb Furnace (Media ____) ____ (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples: ____
Collection Media ____
❑ Spore-Trap ____ (QTY) ❑ Surface Vacuum Dust ____ (QTY)
❑ Surface Swab ____ (QTY) ❑ Culturable ID Genus (Media ____) ____ (QTY)
❑ Surface Tape ____ (QTY) ❑ Culturable ID Species (Media ____) ____ (QTY)
❑ Other (Specify ____) ____ (QTY)

CLIENT ID NUMBER	SAMPLE INFORMATION: SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	MATRIX: AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
13	Dining Room - microwave	11-19		100 cm2				x									Date/Time: Contact: By:
14	ARFOGEN office - Desk	↓		↓				x									
15	Supply office - cabinet							x									
16	Blank							x									
17	Blank		0					x									Date/Time: Contact: By:
18	Kitchen Pipe							x			x						
																	Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: ____ / ____ / ____ @ ____ Via: ____ By (Print): ____ Sign: ____
2. Date/Time Analyzed: ____ / ____ / ____ @ ____ By (Print): ____ Sign: ____
3. Results Reported To: ____ Date: ____ / ____ / ____ Initials: ____
4. Comments: ____

Appendix B. Photographs

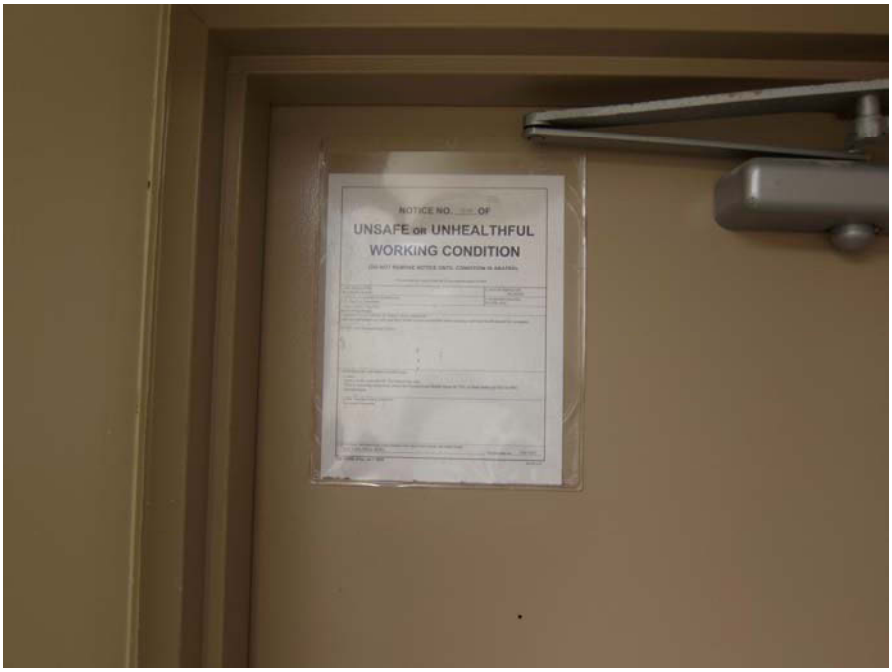
Exterior of facility

Garage area

Garage flammable storage, fire extinguisher and spill kit

Garage fist aid kit

Peeling paint on pipes in kitchen



Lead warning sign on door to converted firing range

Inside view of the converted firing range

Broom inside the converted firing range, note that dry sweeping should not be performed in a lead dust hazard area

Shop vac inside the converted firing range note that only HEPA vacuums should be used in a lead dust hazard area

Front entrance water damage on ceiling plaster

Drill Hall

Classroom water stained ceiling tile

Appendix C. References

1. Title 29 Code of Federal Regulations (CFR), Part 1910.1025, Occupational Safety and Health Administration, Occupational Exposure to Lead

2. American Conference of Governmental Industrial Hygienists (ACGIH) – Threshold Limit Values and Biological Exposure Indices, 2011 Edition

3. Industrial Ventilation: A Manual of Recommended Practice for Design, 27th Edition

4. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Ventilation for Acceptable Indoor Air Quality, 62.1-2010

5. RP-1-2004, Industrial Lighting, Illuminating Engineering Society of North America/ANSI

6. RP-7-2001, Industrial Lighting, Illuminating Engineering Society of North America/ANSI

7. National Emission Standard Hazardous Air Pollutants (NESHAP) – The standards for asbestos are contained in 40 CFR 61.140 through 61.157.

8. Environmental Protection Agency (EPA) standards [40 Code of Federal Regulations (CFR) 745.227(h)(3)]

9. Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM)

10. The US Army Technical Guide 277 Army Facilities Management Information Document on Mold Remediation, February 2002.

11. NG PAM 420-15 Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, 3 NOV 06.

12. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Thermal Environmental Conditions for Human Occupancy, 55-2010.

Shaw Environmental, Inc.

312 Directors Drive
Knoxville, TN 37923
865.690.3211
Fax 865.690.3626

Shaw® Shaw Environmental, Inc.

National Guard Armory
Duncan Readiness Center – New Castle, Delaware

Industrial Hygiene Evaluation

Prepared for:

National Guard Region North Industrial Hygiene Office
Havre De Grace, Maryland 21078

Prepared by:

Shaw Environmental. Inc.
312 Directors Drive
Knoxville, Tennessee 37923

26 October 2003

National Guard Armory
Duncan Readiness Center – New Castle, Delaware

Industrial Hygiene Evaluation

Prepared for:

National Guard Region North Industrial Hygiene Office
Havre De Grace, Maryland 21078

Prepared by:
Shaw Environmental, Inc.
312 Directors Drive
Knoxville, Tennessee 37923

26 October 2003

Prepared by: Non-Responsive _____
Industrial Hygienist

Reviewed by: Non-Responsive _____
Business Line Manager

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Table of Contents

List of Tables

List of Appendices

Executive Summary

Shaw Environmental, Inc. was contracted to perform an industrial hygiene evaluation for the Duncan Readiness Center in New Castle, Delaware. Non-Responsive performed the evaluation on 6 June 2003. The point of contact at the readiness center was SFC Non-Responsive

The following industrial hygiene concerns were evaluated.

- Wipe Sampling for Lead
- Air Sampling for Lead
- Peeling Paint – Lead
- Suspected Asbestos Containing Material
- Water Damage
- Presence of Mold
- Housekeeping
- Ergonomic Concerns
- Indoor Air Quality
- Safety and Industrial Hygiene Programs
- Ventilation System Evaluation
- Contamination of Clean Air Sources
- Noise
- Lighting
- Converted Indoor Firing Ranges
- HVAC Systems

The following items were either not applicable to the armory or the evaluation resulted in a conclusion that there were no industrial hygiene concerns.

- Wipe Sampling for Lead
- Air Sampling for Lead
- Peeling Paint – Lead
- Suspected Asbestos Containing Material
- Presence of Mold
- Visual Inspection – Housekeeping
- Indoor Air Quality

- Safety and Industrial Hygiene Programs
- Ventilation System Evaluation
- Contamination of Clean Air Sources
- Noise

Areas where there were industrial hygiene concerns are as follows:

- Water damage was observed in the lobby at the armory. The source of the water damage was likely from roof leaks, however, the source should be identified and actions taken to eliminate the source in order to prevent the possibility of mold growth that may lead to indoor air quality problems.
- Interviews with office employees revealed that there are ergonomic concerns at the armory. The office workstations should be evaluated to determine if they could be modified in order to improve ergonomic conditions.
- Lighting measurements were conducted at the armory. The lighting did not meet the minimum requirements in almost all areas evaluated, therefore, consideration should be given to providing more lighting to the areas evaluated.
- One wipe sample collected for lead on the exhaust ventilation system floor in the converted indoor firing range revealed lead exceeded recommended levels. Based on Department of Army guidelines, this area must be decontaminated by a thorough cleaning along with re-sampling until surface lead concentrations are reduced to below recommended levels. Employees should not be allowed to work in this area without protective clothing.
- It was deemed that maintenance does not occur on a regular basis for the heating and cooling systems. Maintenance should occur on a regular basis to ensure that the heating and cooling systems are maintained in a good condition.

1.0 Introduction

Shaw Environmental, Inc. was contracted to perform an industrial hygiene evaluation for the Duncan Readiness Center in New Castle, Delaware. Non-Responsive performed the evaluation on 6 June 2003. The point of contact at the readiness center was SFC Non-Responsive

The findings, discussion, and interpretation of results are provided in Section 2.0. The conclusions are provided in Section 3.0. The HHIM data forms for the facility are provided in Appendix A. The building layout is provided in Appendix B. Sampling sheets and laboratory analyses are provided in Appendix C. References are provided in Appendix D. The *Recommendations for Surface Lead Dust in Armories* document is provided in Appendix E.

The statements, opinions, and conclusions contained in this report are based solely upon the services performed by Shaw as described in the report. In performing these services and preparing the report, Shaw relied upon the work and information provided by others, including public agencies, whose information is not guaranteed by Shaw Environmental, Inc.

2.0 Findings, Discussion, and Interpretation of Results

The results, discussion, and interpretation of results are provided in the following sections.

2.1. Sampling for Lead

2.1.1 Wipe Sampling

Wipe samples were collected for lead from the drill floor. Also, wipe samples were collected for lead in rooms, hallways, foyers, etc. The sampling in rooms, hallways, foyers, etc. represented approximately 25% of the building. Approximately half of the samples were collected from surfaces in common areas, such as surfaces of a desk. The remaining samples were collected from uncommon surface areas, such as a supply vent or the top of a file cabinet. The samples were collected and analyzed in accordance with the Instructions for *Completing the Sampling of ARMY National Guard Armories* procedure.

Results of the wipe sampling are provided in Table 1. The results revealed lead below the recommended level of 200 micrograms per square foot ($\mu g/ft^2$) (see Appendix E); therefore, no actions are necessary.

The only samples initially submitted for analysis were those from the drill floor. If there were any positive results from the drill floor, the other samples would be submitted for analysis. Since the results revealed lead at levels below 200 $\mu g/ft^2$, the other wipe samples were not submitted for analysis.

2.1.2 Air Sampling

Breathing zone air sampling was conducted on two (2) full-time building occupants. (Please note that no State employees were monitored.) The samples were collected and analyzed in accordance with Method 7082 of the National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods.

The results of the sampling are provided in Table 2. The results revealed non-detectable concentrations of lead in the breathing zone of the employees, therefore no

action is necessary.

2.2 Physical Condition of Facility

2.2.1 Peeling Paint - Lead

Peeling paint was observed in the armory. Bulk sampling results revealed lead concentrations at levels below 0.5 percent by weight. The Department of Housing and Urban Development (HUD) defines a lead-based paint as paint or other surface coatings that contain lead equal to or exceeding 0.5 percent by weight. Since HUD does not consider the paint a lead-based paint, no actions are necessary. The results of the sampling are provided in Table 3.

2.2.2 Visual Inspection - Asbestos

A visual inspection was made to determine if there was any suspected asbestos-containing material at the armory. The inspection did not reveal any materials suspected of containing asbestos.

2.2.3 Visual Inspection – Water Damage and Mold

A visual inspection was made to determine if there was any water damage or visible mold at the armory. Visible mold was not observed, however, water damage was observed at the armory. The water damage was observed at the lobby ceiling.

The source of the water damage was likely from roof leaks. The source of the water damage should be identified and actions taken to eliminate the source in order to prevent the possibility of mold growth that may lead to indoor air quality problems.

2.2.4 Visual Inspection - Housekeeping

The housekeeping was determined to be good. No dirt or trash was visible on the floors.

2.3. Building Concerns

2.3.1 Ergonomic Concerns

Interviews with employees and observation of work activities revealed that there are ergonomic concerns at the armory. One office employee stated that he had carpal tunnel surgery last summer. The office workstations should be evaluated to determine if they could be modified in order to improve ergonomic conditions.

2.3.2 Indoor Air Quality

Interviews with employees and measurements for carbon dioxide, humidity, and temperature revealed no indoor air quality concerns at the armory. The results of the measurements for carbon dioxide, humidity, and temperature are provided in Table 4.

2.4. Safety and Industrial Hygiene Programs

An evaluation was performed to determine the applicability of the following programs.

- Confined Spaces
- Hearing Conservation
- Respiratory Protection
- Hazard Communication (HAZCOM)
- Personal Protective Equipment (PPE)

It was determined that the confined space, respiratory protection, and hazard communication programs were not applicable at the armory.

It was determined that the hearing conservation and PPE programs were applicable at the facility. The applicable programs were reviewed and it was determined that the programs met minimum requirements.

2.5. Ventilation

2.5.1 Ventilation System Evaluation

There were no local exhaust ventilation systems at this armory, therefore, no ventilation studies were performed.

2.5.2 Contamination of Clean Air Sources

Since there were no local exhaust ventilation systems at the armory, there was no possibility that clean air sources could be contaminated by contaminated exhaust air.

2.6. Noise Dosimetry

An evaluation was performed to determine if there was any hazardous noise areas at the armory. It was determined that the motor pool may be an area at the armory that would exceed the permissible exposure limit for noise, however, no employees were

using any equipment that generated noise, therefore, sampling could not be performed.

2. 7 Lighting

Lighting measurements were conducted at the armory. The lighting did not meet the minimum requirements in the following areas:

- 1st Floor Conference Room
- 1st Floor Office Area (SFC [redacted] Non-Responsive
- 1st Floor Women's Latrine
- 1st Floor Exercise Room
- 1st Floor Lobby
- 1st Floor Motor Pool Offices
- Stairwell
- 2nd Floor Hallway
- 2nd Floor Locker Room
- 2nd Floor Training Room
- 2nd Floor Office Area

Results of the lighting evaluation are provided in Table 5. Consideration should be given to providing more lighting to the areas listed above. This may be accomplished by replacing burnt out luminaries, cleaning fixtures, cleaning windows, painting walls with a lighter color, repositioning detailed work to higher illuminated areas, and using supplemental lighting.

2. 8. Converted Indoor Firing Ranges

There was a converted indoor firing range at the facility, therefore, wipe samples were taken for lead at various locations in or near the range. The results are provided in Table 6. The results revealed lead, with concentrations, at the following locations:

- Exhaust ventilation system floor, at 436 micrograms lead per square foot ($\mu g/ft^2$); and
- Floor, at 101 $\mu g/ft^2$.

The lead concentration on the floor of the converted range was below the

recommended level of 200 $\mu g/ft^2$, a level recommended in the *Guidelines for Converting Indoor Firing Ranges to Other Uses* document (Department of Army), therefore, no actions are necessary. However, the surface concentration of lead on the bullet trap floor was well above the recommended level of 200 $\mu g/ft^2$. This area must be decontaminated by a thorough cleaning along with re-sampling until the surface lead concentration is reduced to below recommended levels. In addition, employees should not be allowed to work in this area without protective clothing.

2.9. HVAC System

The maintenance schedule for the heating and cooling systems was evaluated to verify that maintenance occurs on a regular basis. Also, the condition of the HVAC system was evaluated to determine if the maintenance performed is effective. It was deemed that maintenance does not occur on a regular basis. The evaluation revealed that the heating and cooling systems appeared to be clean.

Maintenance should occur on a regular basis to ensure that the HVAC system is maintained in a good condition.

2.10. HHIM

A Health Hazard Information Module (HHIM) form was completed for the armory. The completed form is provided in Appendix A.

3.0 Conclusions

It is concluded that there were no industrial hygiene concerns at the armory with regards to lead surface contamination, atmospheric exposure to lead, peeling lead-based paint, suspected asbestos-containing material, visible mold, housekeeping, indoor air quality, safety and industrial hygiene programs, ventilation systems or contamination of clean air sources, and noise exposure.

There were industrial hygiene concerns at the armory with regards to water damage, ergonomic conditions, lighting, surface lead contamination in the converted firing range, and HVAC systems. These concerns are discussed in detail in Section 2.0 of this report.

TABLES

Table 1
Wipe Sampling for Lead
National Guard Armory
New Castle (RC, Duncan), Delaware
Date of Sampling: 6 June 2003

Sample Number	Location	Results, $\mu g/ft^2$ [a]
DENEW157-1	Assembly Hall – On Floor	< 23
DENEW157-2	Assembly Hall – On Floor	< 23
DENEW157-3	Assembly Hall – On Floor	< 23
DENEW157-4	Assembly Hall – On Floor	< 23
DENEW157-5	Assembly Hall – On Floor	< 23
DENEW157-6	Field Blank	< 23 µg
DENEW276-1	Assembly Hall – Top of Trophy Case	15
DENEW276-2	Assembly Hall –Top of Television	11
DENEW276-3	Assembly Hall – Top of Vending Machine	32
DENEW276-4	Kitchen – Top of Refrigerator	7
DENEW276-5	SGT Non-Responsive Office – Heating Air Grill	170
DENEW157-6	Field Blank	0.73 µg

[a] Micrograms lead per square foot

The samples were taken and analyzed in accordance with the Instructions for *Completing the Sampling of ARMY National Guard Armories* procedure.

Table 2
Breathing Zone Air Samples for Lead
National Guard Armory
New Castle (RC, Duncan), Delaware
Date of Sampling: 6 June 2003

Sample Number	Employee	Sampling Information			Results (mg/m^3) [a]
		Time Sampled / Minutes	Flow Rate (lpm) [b]	Volume (liters)	
DENEW157-A1	Non-Responsive	1248-1422/ 94	2.443	229.64	<0.004
DENEW157-A2		1250-1423 / 93	2.441	226.97	<0.004
DENEW157-A3	Field Blank	-	-	-	None Detected

[a] Milligrams lead per cubic meter of air.
[b] Liters of air per minute.

Method 7082 of the National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods was followed for sampling for lead.

Table 3
Peeling Paint Sampling for Lead
National Guard Armory
New Castle (RC, Duncan), Delaware
Date of Sampling: 6 June 2003

Sample Number	Location	Results, % By Weight
DEMIL167-PC1	Bay Garage Door	0.013

The Department of Housing and Urban Development (HUD) defines lead-based as paint or other surface coatings that contain lead equal to or exceeding 0.5 percent by weight.

Table 4

Indoor Air Quality Measurements for Carbon Dioxide, Humidity, and Temperature
National Guard Armory
New Castle (RC, Duncan), Delaware
Date of Sampling: 6 June 2003

Location	Occupants in Area	Carbon Dioxide, parts per million parts of air (ppm)	Percent (%) Humidity	Temperature (°F)
1st Floor–Office Area (SFC [redacted] Non-Responsive	2	407	49.3	72.9
2nd Floor Office Area	2	436	45.3	68.7
Outdoors	-	388	52.4	75.6

Carbon dioxide, humidity, and temperature measurements were taken with a TSI Q Trak Plus, Model 8554, Indoor Air Quality Meter, calibrated in April 2003.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommends that indoor carbon dioxide levels be less than 700 ppm above outdoor levels.

ASHRAE recommends that the relative humidity levels be maintained between 30 to 60 percent.

ASHRAE recommends that the acceptable temperature range be 68 degrees Fahrenheit to 74 degrees Fahrenheit in the winter and 73 degrees Fahrenheit to 79 degrees Fahrenheit in the summer.

1

Table 5
Illumination Readings
National Guard Armory
New Castle (RC, Duncan), Delaware
Date of Sampling: 6 June 03

Location	Luminance (fc)[a]	Standard (fc)[a]	Standard Met
1st Floor Conference Room	62.7-89.9	70	Some Areas
1st Floor Office (SFC [redacted])	53.2-83.8	70	Some Areas
1st Floor Women's Restroom	18.1-44.4	40	Some Areas
1st Floor Exercise Room	3.1-75.6	70	Some Areas
1st Floor Lobby	21.4-63.7	70	No
1st Floor Motor Pool Offices	4.2-16.8	70	No
1st Floor Supply Office	24.3-55.8	70	No
Stairwell	4.3-56.4	7.5	Some Areas
2nd Floor Hallway	4.7-46.0	7.5	Some Ares
2nd Floor Locker Room	5.7-16.6	40	No
2nd Floor Training Room	51.7-85.0	70	Some Areas
2nd Floor Office Area	27.4-42.3	70	No

[a] fc - Footcandles

The readings were taken with a Cooke Corporation cal-LIGHT 400 Calibrated Precision Lightmeter, calibrated on 19 Aug 2002.

The standards listed above are from Design Guide DG-415-2, Logistics Facilities, published by the National Guard Bureau Installation Division.

Table 6
Wipe Sampling for Lead – Converted Firing Range
National Guard Armory
New Castle (RC, Duncan), Delaware
Date of Sampling: 6 June 2003

Sample Number	Location	Results, $\mu g/ft^2$ [a]
DENEW157-7	Exhaust ventilation system	BDL[b]
DENEW157-8	Exhaust ventilation system floor (bullet trap not accessible)	436
DENEW157-9	Stored items	BDL
DENEW157-10	Floor	101
DENEW157-11	Outside range	BDL
DENEW157-12	Field Blank	BDL

[a] Micrograms lead per square foot
[b] Below Detectable Limits, at a detection level of 23 $\mu g/ft^2$

Note that a sample was not taken inside the remaining ventilation ductwork because it was not accessible. Also, a sample was not taken on an overhead heater because there were no overhead heaters.

The samples were taken and analyzed in accordance with the Instructions for *Completing the Sampling of ARMY National Guard Armories* procedure.

Appendix A
HHIM Data Forms

HEALTH HAZARD INFORMATION MODULE: INDUSTRIAL HYGIENE SURVEY

(For use of this form, see HHIM User's Guide)

SECTION 1. DEMOGRAPHIC DATA

ARLOC	INSTALLATION	BLDG/RM NO.
42394	RC, Duncan	New Castle

LOCATION/CODE	OPERATION/CODE
Administrative Areas/AA	Administrative Operations/ADO

SURVEY DATE	EVALUATOR (Initials)
6 June 03	AG

MACOM/CODE	SUBMACOM/CODE	SUPERVISOR
7A	XX	SFC Non-Responsive

TELEPHONE/DSN NO.	UNIT/ORGANIZATION	RAC	FREQUENCY (hrs/day)
(302)326-7227	National Guard	5	8

NO. CIV(S)	NO. MIL	NO. CONTRACTOR(S)	NO. LOC(S)	NO. OTHER
	6			

SECTION 2. FACILITY DATA

LAB HOODS	VAPOR DEGREASERS	SPRAY BOOTHS
0	0	0

MAINTENANCE BAYS	OPEN SURFACE TANKS	VENTILATION UNITS
0	0	0

SECTION 3. SURVEY DATA

CONTROLS PRESENT	EVALUATION	UNIT CODE	CONTROLS REQUIRED	STATUS

PERSONAL PROTECTIVE EQUIPMENT (R = Required; U = Utilized)

GLOVES	R/U	RESPIRATOR	NIOSH TC NO.	MANUFACTURER	R/U
ACID	/	AIRLINE			/
COLD SURFACES	/	ABRASIVE BLASTING HOOD			/
HOT SURFACES	/	DISPOSABLE			/
NBC AGENTS	/	FULL FACE AIR PURIFYING			/
OIL	/	1/2 FACE AIR PURIFYING			/
SOLVENTS	/	POWERED AIR PURIFYING			/
SURGICAL GLOVES	/	1/4 FACE AIR PURIFYING			/
		SELF CONTAINED			/

EYES/FACE	R/U	HEARING	R/U	BODY	R/U	HEAD/FIT	R/U
CHEMICAL SPLASH	/	CANAL CAPS	/	APRONS	/	COLD WEATHER BOOTS/HATS	/
FULL FACE SHIELD	/	EARPLUGS	/	COLD WEATHER CLOTHING	/	HARD HATS	/
CHEMICAL/SAFETY	/	HELMETS	/	COVERALLS	/	IMPERMEABLE BOOTS	/
SAFETY/IMPACT	/	MUFFS	/	FULL BODY SUIT	/	SAFETY/CONDUCTIVE SHOES	/
WELDING HELMET	/	MUFF/EARPLUG COMBO	/	HEAT REFLECTIVE VEST/SUIT	/	SAFETY/NON-CONDUCTIVE SHOES	/
		MUFF/EARPLUG W/TIME LIMIT	/	SAFETY BELT/HARNESS	/		/

SECTION 4. HAZARD INVENTORY DATA

CAS CODE	HAZARD DESCRIPTION	PAC	EPC
POVDTXXXX	Video Display Terminal	3	D

SECTION 5. PERSONNEL DATA

LAST NAME	FIRST NAME	MI	SEX	SSN	CATEGORY
Non-Responsive		J	M	Non-Responsive	MIL
			M		MIL
			M		MIL
			F		MIL
			M		MIL
			F		MIL

SECTION 6. COMMENTS

☐ No comments ☐ See attached sheet

Survey conducted by Ms. Non-Responsive Building contains six full-time employees. Employees perform mainly administrat functions. Motor pool area performs routine maintenance of vehicles.

PRIVACY ACT STATEMENT

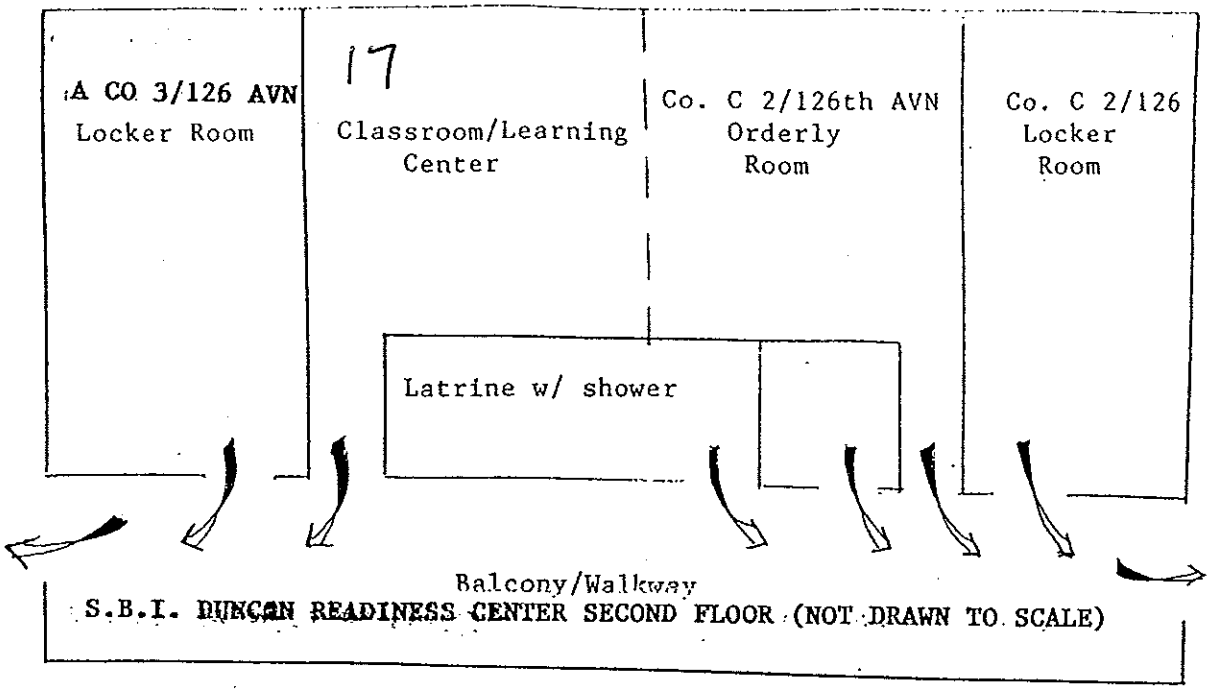
Title 5 US Code, Section 301; Executive Order 9397 authorizes the use of your Social Security Number as an identification number. The purpose of this information is to identify and monitor data relating each DA civilian and military employee exposed to a hazardous workplace or operation. The use of this information is to provide histories of exposures for any given worker.

Disclosure of your Social Security Number is not mandatory; however, nondisclosures may result in untimely provision of proper medical monitoring.

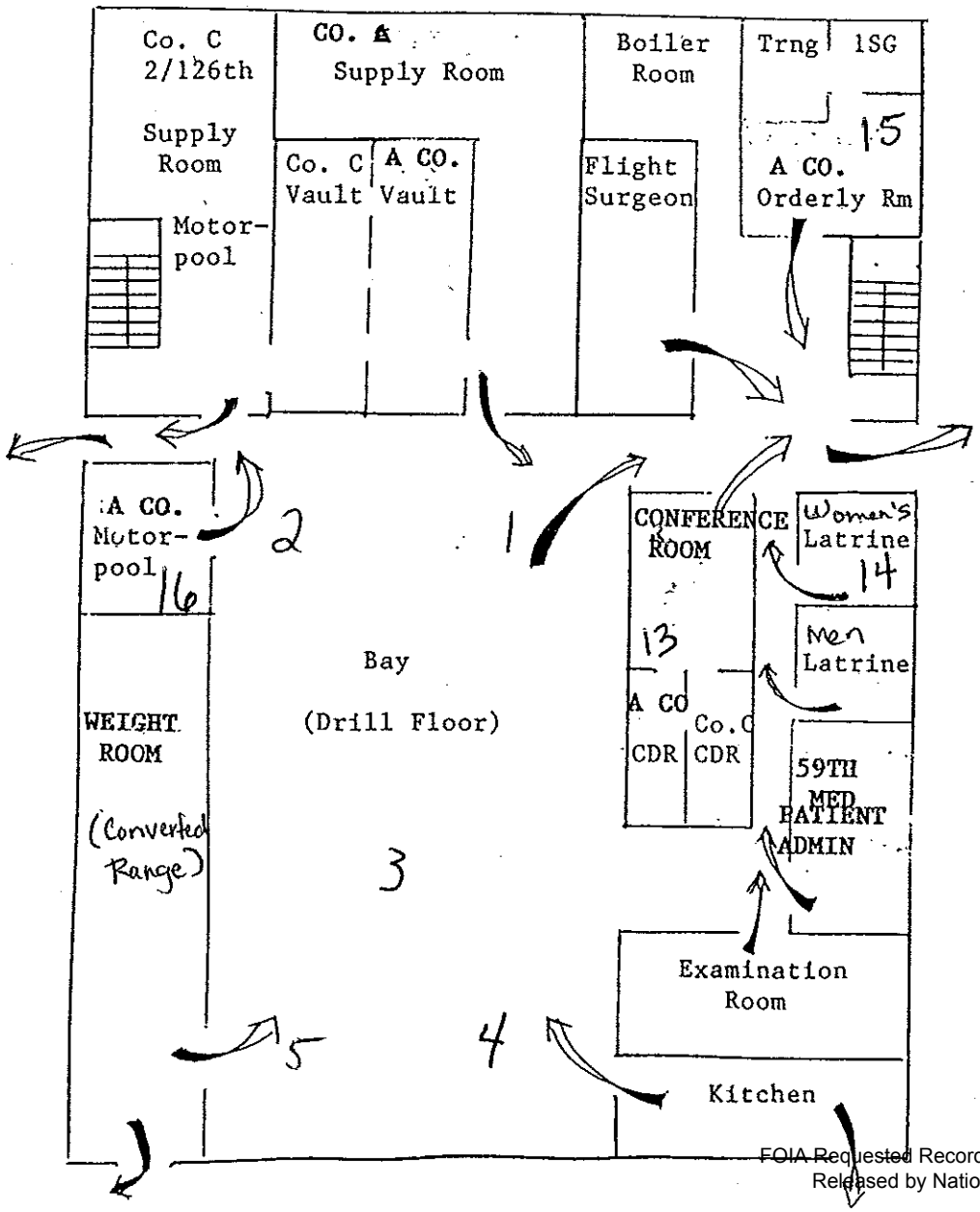
Attach 4

Appendix B
Building Layout

New Castle, DE
RC, Duncan



S.B.I. DUNCAN READINESS CENTER SECOND FLOOR (NOT DRAWN TO SCALE)



Appendix C
Sampling Sheets and Laboratory Analyses

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Delaware National Guard Survey	**Chain Of Custody:**	118604
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	New Castle, Duncan	**Date Analyzed:**	10/15/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	1002	**Report Date:**	15-Oct-03

Attention: [redacted]

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0401653	DENEW276-1	Furnace	Wipe	****	0.111	2.70	ug/ft²	15	ug/ft²	
0401654	DENEW276-2	Furnace	Wipe	****	0.111	2.70	ug/ft²	11	ug/ft²	
0401655	DENEW276-3	Furnace	Wipe	****	0.111	5.40	ug/ft²	32	ug/ft²	ok
0401656	DENEW276-4	Furnace	Wipe	****	0.111	2.70	ug/ft²	7	ug/ft²	
0401657	DENEW276-5	Furnace	Wipe	****	0.111	67.51	ug/ft²	170	ug/ft²	
0401658	DENEW276-6	Furnace	Wipe Blank	****	N/A	0.30	ug	0.73	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B

Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B

N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)

%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)

Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Analyst: [redacted] Non-Responsive

Technical Manager: [redacted]

An AIHA (#8863), NVLAP (# 101143), & New York ELAP (#10920) Accredited Laboratory
4475 Forbes Blvd. • Lanham, MD 20706 • (301) 459-2640 • Toll Free (800) 346-0961 • Fax (301) 459-2643

Reservoirs Environmental, Inc.
2059 Bryant St. Denver, CO 80211
(303) 964-1986 Fax (303) 477-4275 Toll Free (866) RESI-ENV

June 19, 2003

Project Description:
RES 93989-1
06 01
Delaware-Milford, New Castle

Non-Responsive
Shaw Environmental, Inc.
312 Directors Drive
Knoxville TN 37923

Dear Customer,

Reservoirs Environmental, Inc. is an environmental analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the American Industrial Hygiene Association, Lab ID 101533 - Accreditation Certificate #480. The laboratory is currently proficient in both PAT & ELPAT programs respectively.

Reservoirs has analyzed the following sample(s) using Atomic Absorption (AA) / Atomic Emission Spectroscopy - Inductively Coupled Plasma (AES-ICP) per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in Table I. Results have been faxed to your office.

RES 93989-1 is the job number assigned to this study. This report is considered highly confidential and property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those authorized by the client. Samples will be disposed of after sixty days unless longer storage is requested. If you should have any questions about this report, please feel free to call me at 303-964-1986.

Sincerely,

Non-Responsive

President

RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Accredited Laboratory #101896
AIHA Certificate of Accredidation #480 LAB ID 101533

TABLE I. ANALYSIS: LEAD BY WIPE SAMPLING

RES Job Number:	**RES 93989-1**
Client:	**Shaw Environmental, Inc.**
Client Project Number / P.O.:	**06 01**
Client Project Description:	**Delaware-Milford, New Castle**
Date Samples Received:	**June 12, 2003**
Analysis Type:	**USEPA SW846 3050B / AA(7420)**
Turnaround:	**3-5 Day**
Date Samples Analyzed:	**June 19, 2003**

Client ID Number	Lab ID Number	Sample Area (sq.ft.)	LEAD (µg)	Detection Limit (µg/sq.ft.)	LEAD CONCENTRATION (µg/sq.ft.)
DEMIL157-1	EM 783113	0.11	BDL	23	BDL
DEMIL157-2	EM 783114	0.11	BDL	23	BDL
DEMIL157-3	EM 783115	0.11	BDL	23	BDL
DEMIL157-4	EM 783116	0.11	BDL	23	BDL
DEMIL157-5	EM 783117	0.11	BDL	23	BDL
DEMIL157-6	EM 783118	0.11	BDL	23	BDL
DEMIL157-13	EM 783119	0.11	174.0	23	1582
DEMIL157-14	EM 783120	0.11	41.0	23	373
DEMIL157-15	EM 783121	0.11	997.0	23	9064
DEMIL157-16	EM 783122	0.11	230.0	23	2091
DEMIL157-17	EM 783123	0.11	9.0	23	82
DEMIL157-18	EM 783124	0.11	BDL	23	BDL
DEMIL157-19	EM 783125	0.11	BDL	23	BDL
DEMIL157-23	EM 783126	0.11	BDL	23	BDL
DENEW157-1	EM 783127	0.11	BDL	23	BDL
DENEW157-2	EM 783128	0.11	BDL	23	BDL
DENEW157-3	EM 783129	0.11	BDL	23	BDL
DENEW157-4	EM 783130	0.11	BDL	23	BDL
DENEW157-5	EM 783131	0.11	BDL	23	BDL
DENEW157-6	EM 783132	0.11	BDL	23	BDL
DENEW157-7	EM 783133	0.11	BDL	23	BDL
DENEW157-8	EM 783134	0.11	48.0	23	436
DENEW157-9	EM 783135	0.11	BDL	23	BDL
DENEW157-10	EM 783136	0.11	11.1	23	101
DENEW157-11	EM 783137	0.11	BDL	23	BDL
DENEW157-12	EM 783138	0.11	BDL	23	BDL

***Calculations Based On A 1 sq.ft. Sample Area Unless Otherwise Noted**

BDL = Below Detection Limit

Data Qa RK

RESERVOIRS ENVIRONMENTAL, INC.

2059 Bryant St., Denver CO 80211

Due Date: ______ RESI Job #: RES 03089

Due Time: ______ Page 1 of 2

SAMPLES SUBMITTED BY:
Company: Shaw Environmental, Inc.
Address: 312 Directors Drive
Knoxville, TN 37923
Contact: [redacted] Phone: (302)369-3736 Fax: (410)436-2163 Pager:
Sampler: Phone: Fax: Pager:
Project Number and/or P.O. #: 06-02-04-01
Project Description/Location: Delaware (Dulles?) New Castle

INVOICE TO: (IF DIFFERENT)
[redacted]
Army National Guard HQ W
201-H Old Bay Ln Havre de Grace MD 21078
[redacted] ...uitzern.com

After Hours/Weekend CHARGE: Amount $______ Authorized by: ______

Additional fees apply for after hours and holidays for all analysis types. Samples will be analyzed during normal laboratory hours unless otherwise arranged and specified on the chain of custody. Turnaround is subject to laboratory volume. You will be notified if delays are expected.

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm
PCM/PLM ___2 Hour RUSH ___24 hour ___3-5 weekdays
TEM ___6 Hour RUSH ___24 hour ___3-5 weekdays
Prior Notice REQUIRED for TEM 6 Hour RUSH

METALS LABORATORY HOURS: Weekdays: 8am - 5pm
AA ___SPECIAL RUSH ___24 Hour X 3-5 Day
RCRA 8 ___SPECIAL RUSH ___5 Day ___10 Day
TCLP ___SPECIAL RUSH ___5 Day ___10 Day
Prior notice REQUIRED for SPECIAL RUSH AA, RCRA or TCLP
RCRA and TCLP SPECIAL RUSH is 3 Day Turnaround

ANALYTICAL METHOD
AIR: [ ] PCM 7400a, 7400b, OSHA; [ ] TEM AHERA, Level II, 7402, ISO, Pres/Abs, ISO Indirect Preps, Chatfield; [ ] AA/ICP ___ Metal ___ RCRA 8; Dust, Total, Respirable
BULK: [ ] PLM Short report, Long report, Point Count; [ ] TEM Qual, Quant, Semi-quant; [X] AA/ICP ___ Metal ___ RCRA 8; Paint, Soil, Dust, Wipe, TCLP (ASTM E 1792 approved wipes only)
WATER: [ ] TEM Drinking, Waste Water; [ ] AA Water ___ Metal ___ RCRA 8; Drinking, Waste Water
OTHER: [ ] Specify ______

Special Instructions: Please report in ft 2. Contract # 78-287. Email results to kenneth.forsythe@md.ngb.army.mil

	Client Sample Number	Volume	EM #
1.	DENEW67 1	4 x 4 wipes	783127
2.	DENEW67 2	"	28
3.	-3	"	29
4.	-4	"	30
5.	-5	"	31
6.	-6	"	32
7.	-18 7 Wipe in acquest ...	"	33
8.	-19 8	"	34
9.	-15 9	"	35
10.	-16 10	"	36
11.	-17 11	"	37
12.	-18 12	"	38
13.	-19 Smelling on arrival	"	39
14.	-23	"	40
15.			

Number of samples received: 23 (Use as many additional sheets as needed.)

NOTE: If the package has sustained substantial damage or the custody seal is broken, stop and contact project manager and shipper. RESI will analyze incoming samples based upon information received with those samples. RESI is not responsible for errors or omissions in calculations resulting from the inaccuracy of original data. Turnaround times are based on ... Call laboratory for number of samples guaranteed in short turnaround.

Relinquished By: [redacted] Date/Time: 6/10/03 12:00

Laboratory Use: [redacted] Date/Time: 6-11-03 9:30
Received by:
Carrier:
Custody seal upon receipt:
RESULTS: Fax Email Date Time Initials

SPLITS: Authorization By/Time:
Analytical Method/Turnaround:
Results Due: Results Out:
rev 6/2/01

Lab Bench/Count Sheets Received By: Time Date

Phone: (303) 964-1986 Fax: (303) 477-4275 WATS: 1-866-RESI-ENV (737-4368)
PAGER: ONCALL Pager number available at Lab. Alternate Pagers: PLM/TEM 609-2167 PCM/Metals 609-2093 (AFTER HOURS USE ONLY)

RESERVOIRS ENVIRONMENTAL, INC.

2059 Bryant St., Denver CO 80211

Due Date: ______ RESI Job #: 93969

Due Time: ______ Page 2 of 2

SAMPLES SUBMITTED BY:	INVOICE TO: (IF DIFFERENT)
Company: Shaw Environmental, Inc	[redacted]
Address: 312 Directors Drive	Army National Guard III-W
Knoxville, TN 37923	301-W Old Bay Ln, Havre de Grace, MD 21078
Contact: [redacted] Phone: (302)389-3736	Fax: (410)436-2183 Page:
Contact: Phone:	Fax: Page:
Project Number and/or P.O. #: 06-01	Final Data Deliverable Email Address: [redacted]
Project Description/Location: Delaware - Milford (New Castle)	

After Hours/Weekend CHARGE: Amount $ ______ Authorized by: ______

Additional fees apply for after hours and holidays for all analysis types. Samples will be analyzed during normal laboratory hours unless otherwise arranged and specified on the chain of custody. Turnaround is subject to laboratory volume. You will be notified if delays are expected.

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm

PCM/PLM ___ 2 Hour RUSH ___ 24 hour ___ 3-5 weekdays

TEM ___ 6 Hour RUSH ___ 24 hour ___ 3-5 weekdays

Prior Notice REQUIRED for TEM 6 Hour RUSH

METALS LABORATORY HOURS: Weekdays: 8am - 5pm

AA ___ SPECIAL RUSH ___ 24 Hour X 3-5 Day

RCRA 8 ___ SPECIAL RUSH ___ 5 Day ___ 10 Day

TCLP ___ SPECIAL RUSH ___ 5 Day ___ 10 Day

Prior Notice REQUIRED for SPECIAL RUSH AA, RCRA or TCLP

RCRA and TCLP SPECIAL RUSH is 2 Day Turnaround

ANALYTICAL METHOD

AIR [ ] PCM: 7400A, 7400B, OSHA
[ ] TEM: AHERA, Level II, 7402, ISO, Tres/Ale, ISO Indirect Prep, Chatfield
[ ] AA / ICP ______ Metal ______ RCRA 8
[ ] Dust: Total, Respirable

BULK [ ] PLM: Short report, Long report, Point Count
[ ] TEM: 4%, Quant, Semi-quant
[X] AA / ICP ______ Metal ______ RCRA 8
Paint, Soil, Dust, Wipe, TCLP
(ASTM E 1792 approved wipes only)

WATER [ ] TEM: Drinking, Waste Water
[ ] AA Water ______ Metal ______ RCRA 8
Drinking, Waste Water

OTHER [ ] Specify ______

Special Instructions: Please report in ft 2. Contract # 70-267. Email results to kenneth.forsythe@md.ngb.army.mil

	Client Sample Number	Volume	EM #
1.	DEMILIS7 - 1	4x4" wipes	788113
2.	-2	"	14
3.	-3	"	15
4.	-4	"	16
5.	-5	"	17
6.	-6	"	18
7.	-12 - Missing on Brova?	"	19
8.	-13	"	20 19
9.	-14	"	21 20
10.	-15	"	22 21
11.	-16	"	23 22
12.	-17	"	24 23
13.	-18	"	25 24
14.	-19	"	26 25
15.	23 extra sample received		26

Number of samples received: 15 (Use as many additional sheets as needed.)

NOTE: If the package has sustained substantial damage or the custody seal is broken, stop and contact project manager and shipper. RESI will analyze incoming samples based upon information received with those samples. RESI is not responsible for errors or omissions in calculations resulting from the inaccuracy of original data. Turnaround times are based upon times of receipt [redacted] guaranteed in short turnaround.

Relinquished By: [redacted] Date/Time: 6/10/03 12:00

Laboratory Received By: [redacted] Date/Time: 6/11/03 9:20

Carrier: [redacted] custody seal upon receipt:

RESULTS: [redacted] Fax Email Date Time Initials

SPLITS:	Authorization By/Time:	Lab Bench/Count Sheets Received By:
	Analytical Method/Turnaround:	Time: Date:
rev 6/201	Results Due: Results Out:	

Phone: (303) 964-1986 Fax: (303) 477-4275 WATS: 1-866-RESI-ENV (737-4368)

PAGER: ONCALL Pager number available at Lab. Alternate Pagers: PLM/TEM 509-2187 PCM/Metals 509-2098 (AFTER HOURS USE ONLY)

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
312 Directors Drive
Knoxville, OH 37923

Reference Data:	**Lead**
Client Sample No.:	DENEW157-PC1 through DEMIL157-PC1
P.O. No.:	06-02
Sample Location:	Delaware
Sample Type:	Paint Chip
Method Reference:	3050B/6010B
DCL Set ID No.:	03-S-2866
DCL Sample ID No.:	03-18309 through 03-18313
Sample Receipt Date:	6/11/2003
Preparation Date:	06/16/03
Analysis Date:	06/18/03

The samples were prepared in accordance with EPA method 3050B. Sample condition was acceptable upon receipt except where noted. The samples were then analyzed in accordance with EPA method 6010B using a Perkin Elmer 3000XL ICP.

The results are provided in the enclosed data table. Results relate only to the items tested and are not blank corrected unless indicated in the data table.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Non-Responsive [redacted]
Analyst

Non-Responsive [redacted]
Reviewer

CINCINNATI OFFICE
4388 GLENDALE-MILFORD ROAD
CINCINNATI, OHIO 45242-3708
513 733-5336, FAX 513 733-5347

WEST COAST OFFICE
11 SANTA YORMA COURT
NOVATO, CALIFORNIA 94945
800 280-8071, FAX 415 893-9469

Results
Lead

Client #	DCL #	mg/Kg (ppm)	% by weight
DENEW157-PC1	03-18309	130.	0.013
DEMIL157-PC1	03-18313	110.	0.011
	Prep Blank	ND	
% Recovery	LCS	98.	
% Recovery	MS	NA	
% Recovery	MSD	NA	
RPL		25.	0.0025

ND = not detected at or above the reporting limit (RPL).
LCS = laboratory control sample.
MS/MSD = matrix spike/matrix spike duplicate.
NA indicates the sample result was greater than four times the spiked amount.

Non-Responsive [redacted]
Analyst

Non-Responsive [redacted]
Reviewer

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
312 Directors Drive
Knoxville, OH 37923

Reference Data:	**Lead**
Client Sample No.:	DENEW157-A1 through DEMIL157-A3
P.O. No.:	06-02
Sample Location:	Delaware
Sample Type:	Filter
Method Reference:	NIOSH 7300
DCL Set ID No.:	03-S-2866
DCL Sample ID No.:	03-18306 through 03-18312
Sample Receipt Date:	6/11/2003
Preparation Date:	06/13/03
Analysis Date:	06/16/03

The samples were prepared and analyzed in accordance with NIOSH method 7300 using a Perkin Elmer 3000XL ICP.

The sample condition upon receipt was acceptable except where noted.

The results are in the enclosed data table. Results relate only to the items tested and are not blank corrected unless indicated in the data table.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Non-Responsive
Analyst

Non-Responsive
Reviewer

CINCINNATI OFFICE
4388 GLENDALE-MILFORD ROAD
CINCINNATI, OHIO 45242-3706
513 733-6336, FAX 513 733-5347

WEST COAST OFFICE
11 SANTA YORMA COURT
NOVATO, CALIFORNIA 94945
800 280-8071, FAX 415 893-9469

Results
Lead

Client #	DCL #	Sample Volume (L)	µg/sample	mg/m³
DENEW157-A1	03-18306	229.64	ND	<0.004
DENEW157-A2	03-18307	226.97	ND	<0.004
DENEW157-A3	03-18308	0	ND	-
DEMIL157-A1	03-18310	279.76	ND	<0.004
DEMIL157-A2	03-18311	279.87	ND	<0.004
DEMIL157-A3	03-18312	0	ND	-
	Prep Blank		ND	
% Recovery	LCS		111.	
RPL			1.	

ND = not detected at or above the reporting limit (RPL).
LCS = laboratory control sample.

Non-Responsive

Analyst

Non-Responsive

Reviewer

DATA CHEM LABORATORIES

ANALYTICAL REQUEST FORM

1. X REGULAR Status

RUSH Status Requested - ADDITIONAL CHARGE
RESULTS REQUIRED BY _____ DATE
CONTACT DATACHEM LABS PRIOR TO SENDING SAMPLES.

2. Date 6/6/03 Purchase Order No. 05-04 06-02

3. Company Name Shaw Environmental, Inc.
Address 312 Directors Drive
Knoxville, TN 37923
Person to Contact Non-Responsive
Telephone (303) 369-3736
Fax Telephone (410) 436-2113
Billing Address (if different from above)
Non-Responsive Army National Guard IH-W
301-IH Old Bay Ln, Havre de Grace, MD 21075

4. Quote No. _____
DCL Project Manager _____

5. Sample Collection
Sampling Site Delaware
Industrial Process _____
Date of Collection 6/6/03
Time Collected Various
Date of Shipment 6/10/03
Chain of Custody No. _____
Collector's Name / Sig Non-Responsive

6. REQUEST FOR ANALYSES 03-S2-2866

Laboratory Use Only 03	Client Sample Number	Media Type*	Sample Volume (Liters)	ANALYSES REQUESTED - Use Method Number if Known
18306	DENEW157-A1	MCEF	~~229.69~~ Blank	Lead
18307	" -A2	↓	226.97	↓
18308	" -A3	↓	Blank	
18309	DENEW157-PC1	Bulk		
18310	DENEW157-A1	MCEF	279.76	
18311	" -A2	↓	279.87	
18312	" -A3	↓	Blank	
18313	" -PC1	Bulk		↓

*Specify: Solid sorbent tube, e.g. Charcoal; Filter type; Impinger solution; Bulk Sample; Blood; Urine; Tissue; Soil; Water; Other

7. QC REQUIREMENTS
MUST BE COMPLETED FOR ENVIRONMENTAL SAMPLES - See General Services Terms and Conditions: QC samples billed at regular sample rate

☐ METHOD QC SAMPLES
(Lab QC according to published methods)
☐ PROJECT PLAN QC SAMPLES
(Lab QC according to provided QA/QC Plan)
☐ NO QC SAMPLES REQUESTED
(May not conform to Agency requirements)
☐ OTHER (as specified below)

Non-Responsive

Comments _____

Possible Contan Non-Responsive

8. Requested by _____

960 West LeVoy Drive / Salt Lake City, UT 84123 800-356-9135 or 801-266-7700 / Fax: 801-268-9992
4388 Glendale-Milford Road / Cincinnati, OH 45242 800-458-1493 or 513-733-5336 / Fax: 513-733-5347

DATACHEM LABORATORIES - A SORENSON COMPANY

DISTRIBUTION: WHITE - LABORATORY COPY CANARY - CUSTOMER COPY

Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory **Location:** New Castle
41 Corporate Circle

Date: 6/6/03

Sample 1

Sample Number: DENEW157-A1

Pump: 647615

	Pre Flow Rate	Post Flow Rate
	2.428	2.431
	2.462	2.436
	2.458	2.441
Average	2.449	2.436

Average Pre and Post 2.443

Time 1 12:48
Time 2 2.22
Total Time Sampled
Minutes Sampled 94 minutes

Volume 229.64 **Liters**

Sample 2

Sample Number: DENEW157-A2

Pump: 6~~7~~8339

	Pre Flow Rate	Post Flow Rate
	2.448	2.437
	2.450	2.427
	2.448	2.432
Average	2.449	2.432

Average Pre and Post 2.441

Time 1 12:50
Time 2 2:23
Total Time Sampled
Minutes Sampled 93 minutes

Volume 26.97 **Liters**

Appendix D
References

References

Title 29, Code of Federal Regulations CFR), Part 1910, Occupational Safety and Health Administration (current edition)

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc (ASHRAE) 62-2002, Ventilation for Acceptable Indoor Air Quality

Instructions for Completing the Sampling of ARMY National Guard Armories, Lead Wipe Sampling Procedure included with the Request for Proposal

Air Sampling for Lead - Method 7082 of the National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods

Design Guide DG-415-2, Logistics Facilities, National Guard Bureau Installation Division, 14 December 1999

Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998

Army Regulation (AR) 40-5, Medical Service, Preventative Medicine, 15 October 1990

AR 385-10, The Army Safety Program, 29 February 2000

Department of the Army Pamphlet (DA PAM) 40-501, Medical Services, Hearing Conservation Program, 10 December 1998

DA PAM 40-503, Medical Services, Industrial Hygiene Program, 30 October 2000

Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH) (current edition)

Guidelines for Converting Indoor Firing Ranges to Other Uses, Headquarters, Department of the Army and the Air Force, NG PAM (AR) 385-16/ANGPAM 91-101, 31 January 1994

24 CFR, Part 35, Subpart B, Section 35-110, Definition of Lead-Based Paint, Housing and Urban Development, U. S. Department of Housing

Appendix E
Recommendations for
Surface Lead Dust in Armories

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.

Shaw Environmental, Inc.

312 Directors Drive
Knoxville, TN 37923
865.690.3211
Fax 865.690.3626

Shaw® Shaw Environmental, Inc.

National Guard Readiness Center
Pigman Readiness Center, Seaford, Delaware

Industrial Hygiene Evaluation

Prepared for:

National Guard Region North Industrial Hygiene Office
Havre De Grace, Maryland 21078

Prepared by:

Shaw Environmental. Inc.
312 Directors Drive
Knoxville, Tennessee 37923

26 October 2003

National Guard Readiness Center
Pigman Readiness Center, Seaford, Delaware

Industrial Hygiene Evaluation

Prepared for:

National Guard Region North Industrial Hygiene Office
Havre De Grace, Maryland 21078

Prepared by:
Shaw Environmental, Inc.
312 Directors Drive
Knoxville, Tennessee 37923

26 October 2003

Prepared by: Non-Responsive _____
Industrial Hygienist

Reviewed by: Non-Responsive _____
Business Line Manager

Table of Contents

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Executive Summary

Shaw Environmental, Inc. was contracted to perform an industrial hygiene evaluation for the Pigman Readiness Center in Seaford, Delaware Non-Responsive performed the evaluation on 13 June 2003. The point of contact at the readiness center was SSG Non-Responsive

The following industrial hygiene concerns were evaluated.

- Wipe Sampling for Lead
- Air Sampling for Lead
- Peeling Paint – Lead
- Suspected Asbestos Containing Material
- Water Damage
- Presence of Mold
- Housekeeping
- Ergonomic Concerns
- Indoor Air Quality
- Safety and Industrial Hygiene Programs
- Ventilation System Evaluation
- Contamination of Clean Air Sources
- Noise
- Lighting
- Converted Indoor Firing Ranges
- HVAC Systems

The following items were either not applicable to the armory or the evaluation resulted in a conclusion that there were no industrial hygiene concerns.

- Wipe Sampling for Lead
- Air Sampling for Lead
- Peeling Paint – Lead
- Suspected Asbestos Containing Material
- Presence of Mold
- Housekeeping
- Ergonomic Concerns

- Safety and Industrial Hygiene Programs
- Ventilation System Evaluation
- Contamination of Clean Air Sources
- Noise Dosimetry
- Converted Indoor Firing Ranges
- HVAC Systems

Areas where there were industrial hygiene concerns are as follows:

- Water damage was observed on the cafeteria wall (near entrance doors). The source was probably from roof leaks, however, the source should be identified and actions taken to eliminate the source in order to prevent the possibility of mold growth that may lead to indoor air quality problems.
- Indoor air quality measurements revealed there are indoor air quality concerns at the armory. The humidity and temperature were above the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) indoor air quality recommendations. It appeared that the HVAC system is inadequate in controlling the temperature and humidity within the comfort parameters. Consideration should be given to evaluating the HVAC system to ensure that it is working properly so that it will provide adequate cooling and humidity control for the armory. In addition, a fan could be used for cooling purposes to circulate the air.
- Lighting measurements were conducted at the armory. The lighting did not meet the minimum requirements in some areas evaluated, therefore, consideration should be given to providing more lighting to the areas evaluated.

1.0 Introduction

Shaw Environmental, Inc. was contracted to perform an industrial hygiene evaluation for the Pigman Readiness Center in Seaford, Delaware. Non-Responsive performed the evaluation on 13 June 2003. The point of contact at the readiness center was SSG Non-Responsive

The findings, discussion, and interpretation of results are provided in Section 2.0. The conclusions are provided in Section 3.0. The HHIM data forms for the facility are provided in Appendix A. The building layout is provided in Appendix B. Sampling sheets and laboratory analyses are provided in Appendix C. References are provided in Appendix D. The *Recommendations for Surface Lead Dust in Armories* document is provided in Appendix E.

The statements, opinions, and conclusions contained in this report are based solely upon the services performed by Shaw as described in the report. In performing these services and preparing the report, Shaw relied upon the work and information provided by others, including public agencies, whose information is not guaranteed by Shaw Environmental, Inc.

2.0 Findings, Discussion, and Interpretation of Results

The results, discussion, and interpretation of results are provided in the following sections.

2.1. Sampling for Lead

2.1.1 Wipe Sampling

Wipe samples were collected for lead from the drill floor. Also, wipe samples were collected for lead in rooms, hallways, foyers, etc. The sampling in rooms, hallways, foyers, etc. represented approximately 25% of the building. Approximately half of the samples were collected from surfaces in common areas, such as surfaces of a desk. The remaining samples were collected from uncommon surface areas, such as a supply vent or the top of a file cabinet. The samples were collected and analyzed in accordance with the Instructions for *Completing the Sampling of ARMY National Guard Armories* procedure.

Results of the wipe sampling are provided in Table 1. The results revealed lead below the recommended level of 200 micrograms per square foot ($\mu g/ft^2$) (see Appendix E); therefore, no actions are necessary.

The only samples initially submitted for analysis were those from the drill floor. If there were any positive results from the drill floor, the other samples would be submitted for analysis. Since the results revealed lead at levels below 200 $\mu g/ft^2$, the other wipe samples were not submitted for analysis.

2.1.2 Breathing Zone Air Sampling

Breathing zone air sampling was collected on one (1) full-time building occupant (the only employee present). (Please note that no State employees were monitored.) The sample was collected and analyzed in accordance with Method 7082 of the National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods. The results of the sampling are provided in Table 2. The results revealed non-detectable concentrations of lead in the breathing zone of the employee, therefore, no action is necessary.

2.2 Physical Condition of Facility

2.2.1 Peeling Paint - Lead

Peeling paint was observed in the armory. Bulk sampling results revealed lead concentrations at levels below 0.5 percent by weight. The Department of Housing and Urban Development (HUD) defines a lead-based paint as paint or other surface coatings that contain lead equal to or exceeding 0.5 percent by weight. Since HUD does not consider the paint a lead-based paint, no actions are necessary. The results of the sampling are provided in Table 3.

2.2.2 Visual Inspection - Asbestos

A visual inspection was made to determine if there was any suspected asbestos-containing material at the armory. The inspection did not reveal any materials suspected of containing asbestos.

2.2.3 Visual Inspection – Water Damage and Mold

A visual inspection was made to determine if there was any water damage or visible mold at the armory. Visible mold was not observed, however, water damage was observed at the armory. The water damage was observed at the cafeteria wall near entrance doors.

The source of the water damage was likely from roof leaks. The source of the water damage should be identified and actions taken to eliminate the source in order to prevent the possibility of mold growth that may lead to indoor air quality problems.

2.2.4 Visual Inspection - Housekeeping

The housekeeping was determined to be good. No trash was visible on the floors.

2.3. Building Concerns

2.3.1 Ergonomic Concerns

Interviews with employees and observation of work activities revealed no ergonomic concerns at the armory.

2.3.2 Indoor Air Quality

Measurements for carbon dioxide, humidity, and temperature revealed there were indoor air quality concerns at the armory. The humidity and temperature were above

the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) indoor air quality recommendations. It appeared that the HVAC system is inadequate in controlling the temperature and humidity within the comfort parameters. Consideration should be given to evaluating the HVAC system to ensure that it is working properly so that it will provide adequate cooling and humidity control for the armory. In addition, a fan could be used for cooling purposes to circulate the air.

The results of the measurements for carbon dioxide, humidity, and temperature are provided in Table 4.

2.4. Safety and Industrial Hygiene Programs

An evaluation was performed to determine the applicability of the following programs.

- Confined Spaces
- Hearing Conservation
- Respiratory Protection
- Hazard Communication (HAZCOM)
- Personal Protective Equipment (PPE)

It was determined that none of the programs were applicable at the armory.

2.5. Ventilation

2.5.1 Ventilation System Evaluation

There were no local exhaust ventilation systems in use at this armory; therefore, no ventilation studies were performed. The armory contains a maintenance shop with local exhaust; however, the shop is no longer in use. A ventilation evaluation was performed in the maintenance bay. Airflow patterns were observed with the use of Gastec smoke tubes, and the airflow was deemed acceptable. The airflow patterns are shown in Figure 1.

2.5.2 Contamination of Clean Air Sources

An evaluation was performed to determine if clean air sources could be contaminated by exhaust air. The evaluation revealed that there was no evidence that clean air

sources could be contaminated by exhaust air.

2.6. Noise Dosimetry

An evaluation was performed to determine if there was any hazardous noise areas at the armory. It was determined that there were no areas at the armory that would exceed the permissible exposure limit for noise.

2. 7 Lighting

Lighting measurements were conducted at the armory. The lighting did not meet the minimum requirements in the following areas:

- Training Room
- Room 114
- Room 115
- Room 119
- Room 120
- Library
- Women's Restroom
- Men's Restroom
- Room 112
- NBC Room
- Room 107
- Cafeteria
- Room 102
- Kitchen
- Kitchen Storage
- Room 215
- Room 214
- Room 211
- Room 210
- Room 208
- Room 207
- Room 128
- Room 124
- Room 123
- Exercise Room
- Drill Floor

Results of the lighting evaluation are provided in Table 5. Consideration should be given to providing more lighting to the areas listed above. This may be accomplished by replacing burnt out luminaries, cleaning fixtures, cleaning windows, painting walls with a lighter color, repositioning detailed work to higher illuminated areas, and using supplemental lighting.

2. 8. Converted Indoor Firing Ranges

There was not a converted indoor firing range at the armory. Note that there was an inactive firing range that had not been converted. Lead wipe samples were taken to determine the degree of lead surface contamination, As expected, lead levels were well above 200 $\mu g/ft^2$ since this was an active firing range. The results of the lead wipe sampling are provided in Table 6.

2.9. HVAC System

The maintenance schedule for the HVAC system was evaluated to verify that maintenance occurs on a regular basis. Also, the condition of the HVAC system was evaluated to determine if the maintenance performed is effective. It was deemed that maintenance occurs on a regular basis, and the maintenance performed is effective.

Maintenance should occur on a regular basis to ensure that the HVAC system is maintained in a good condition.

2.10. HHIM

A Health Hazard Information Module (HHIM) form was completed for the armory. In addition, a HHIM was completed for the maintenance bay at the armory. The completed forms are provided in Appendix A.

3.0 Conclusions

It is concluded that there were no industrial hygiene concerns at the armory with regards to lead surface contamination, atmospheric exposure to lead, peeling lead-based paint, suspected asbestos-containing material, visible mold, housekeeping, ergonomic conditions, safety and industrial hygiene programs, ventilation systems or contamination of clean air sources, noise exposure, surface lead contamination in a converted firing range, and HVAC systems.

There were industrial hygiene concerns at the armory with regards to water damage, indoor air quality, and lighting. These concerns are discussed in detail in Section 2.0 of this report.

TABLES

Table 1
Wipe Sampling for Lead
National Guard Armory
Seaford, Delaware
Date of Sampling: 13 June 2003 and 2 October 2003

Sample Number	Location	Results, $\mu g/ft^2$ [a]
DESEA164-1	Assembly Hall – On Floor	< 23
DESEA164-2	Assembly Hall – On Floor	< 23
DESEA164-3	Assembly Hall – On Floor	35
DESEA164-4	Assembly Hall – On Floor	< 23
DESEA164-5	Assembly Hall – On Floor	< 23 µg
DESEA164-6	Field Blank	12
DESEA275-1	Assembly Hall – HVAC Supply Air Grill	18
DESEA275-2	Assembly Hall – HVAC Exhaust Air Grill	19
DESEA275-3	CPT Cooke's Office – Exhaust Air Grill	7.5
DESEA275-4	Assembly Hall – Window Sill	8
DESEA275-5	Kitchen – Top of Dishwashing Machine	0.76 µg
DESEA164-6	Field Blank	

[a] Micrograms lead per square foot

The samples were taken and analyzed in accordance with the Instructions for *Completing the Sampling of ARMY National Guard Armories* procedure.

Table 2
Breathing Zone Air Samples for Lead
National Guard Armory
Seaford, Delaware
Date of Sampling: 13 June 2003

Sample Number	Employee	Sampling Information			Results (mg/m^3) [a]
		Time Sampled / Minutes	Flow Rate (lpm) [b]	Volume (liters)	
DESEA164-A1	Non-Responsive	1251-1421 / 90	2.484	223.25	<0.004
DESEA164-A3	Field Blank	-	-	-	None Detected

[a] Milligrams lead per cubic meter of air.
[b] Liters of air per minute.

Only one employee was sampled because there were no other employees at the armory on the date of the survey.

Method 7082 of the National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods was followed for sampling for lead.

Table 3
Peeling Paint Sampling for Lead
National Guard Armory
Seaford, Delaware
Date of Sampling: 13 June 2003

Sample Number	Location	Results, % By Weight
DESEA164-PC1	Firing Range Wall	0.0056

The Department of Housing and Urban Development (HUD) defines lead-based as paint or other surface coatings that contain lead equal to or exceeding 0.5 percent by weight.

Table 4
Indoor Air Quality Measurements for Carbon Dioxide, Humidity, and Temperature
National Guard Armory
Seaford, Delaware
Date of Sampling: 13 June 2003

Location	Occupants in Area	Carbon Dioxide, parts per million parts of air (ppm)	Percent (%) Humidity	Temperature (°F)
1st Floor–Drill Floor	2	495	82.0	80.6
Outdoors	-	495	79.0	82.2

Carbon dioxide, humidity, and temperature measurements were taken with a TSI Q Trak Plus, Model 8554, Indoor Air Quality Meter, calibrated in April 2003.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommends that indoor carbon dioxide levels be less than 700 ppm above outdoor levels.

ASHRAE recommends that the relative humidity levels be maintained between 30 to 60 percent.

ASHRAE recommends that the acceptable temperature range be 68 degrees Fahrenheit to 74 degrees Fahrenheit in the winter and 73 degrees Fahrenheit to 79 degrees Fahrenheit in the summer.

Table 5
Illumination Readings
National Guard Armory
Seaford, Delaware
Date of Sampling: 13 June 2003

Location	Luminance (fc)[a]	Standard (fc)[a]	Standard Met
Training Room	33.2-80.7	70	Some Areas
Office Area - Room 114	6.2-47.4	70	No
Office Area - Room 115	7.1-84.9	70	Some Areas
Office Area - Room 119	25.7-48.3	70	No
Office Area - Room 120	18.6-23.4	70	No
Library - Room 113	45.8-88.8	70	Some Areas
Women's Restroom	10.8-44.6	40	Some Areas
Men's Restroom	6.2-34.3	40	No
Office Area - Room 112	7.3-40.7	70	No
NBC Room (Storage Room)	5.2-14.5	30	No
Office Area - Room 107	18.1-105.5	70	Some Areas
Cafeteria	22.7-34.4	30	Some Areas
Storage Room - Room 102	6.7-15.6	30	No
Kitchen	34.7-60.4	70	No
Kitchen Storage	8.7-27.1	30	No
Office Area - Room 215	51.0-71.3	70	Some Areas
Office Area - Room 214	59.9-83.1	70	Some Areas
Office Area - Room 211	43.3-57.3	70	No
Office Area- Room 210	47.2-93.1	70	Some Areas
Office Area - Room 208	14.4-33.3	70	No
Office Area - Room 207	9.3-22.7	70	No
Office Area - Room 124	32.4-71.9	70	Some Areas
Storage Room - Room 123	4.1-9.8	30	No
Storage Room - Room 216	39.4-52.8	30	Yes
Exercise Room	39.4-52.8	70	No
Drill Floor	48.5-59.4	70	No

Table 5 (Continued)
Illumination Readings
National Guard Armory
Seaford, Delaware
Date of Sampling: 13 June 2003

[a] fc - Footcandles

The readings were taken with a Cooke Corporation cal-LIGHT 400 Calibrated Precision Lightmeter, calibrated on 19 Aug 2002.

The standards listed above are from Design Guide DG-415-2, Logistics Facilities, published by the National Guard Bureau Installation Division.

Table 6
Wipe Sampling for Lead – Firing Range
National Guard Armory
Seaford, Delaware
Date of Sampling: 13 June 2003

Sample Number	Location	Results, $\mu g/ft^2$ [a]
DESEA164-8	Inside remaining ventilation ductwork	1482
DESEA164-7	Exhaust ventilation system	2500
DESEA164-9	Light fixtures (couldn't reach – wiped pulleys)	11,000
DESEA164-10	Overhead heaters	1909
DESEA164-11	Stored items	4455
DESEA164-12	Floor	51,909
DESEA164-13	Outside the range	42,455
DESEA164-14	Field Blank	BDL[b]

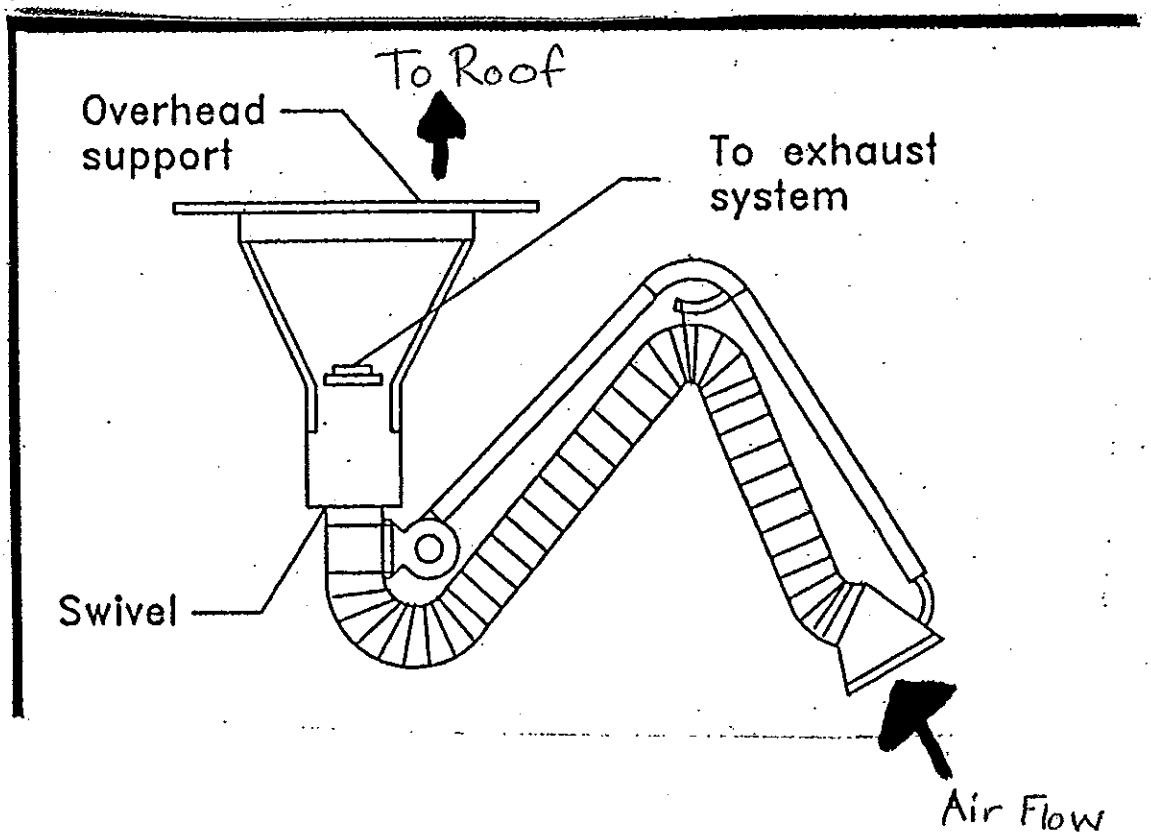
[a] Micrograms lead per square foot
[b] Below Detectable Limits, at a detection level of 23 $\mu g/ft^2$

The samples were taken and analyzed in accordance with the Instructions for *Completing the Sampling of ARMY National Guard Armories* procedure.

FIGURE 1
AIRFLOW PATTERNS

Cone Hood

- Present in Maintenance Areas
- Attaches to exhaust
- All cone hoods were adequate



Appendix A
HHIM Data Form

HEALTH HAZARD INFORMATION MODULE: INDUSTRIAL HYGIENE SURVEY

(For use of this form, see HHIM User's Guide)

SECTION 1. DEMOGRAPHIC DATA

ARLOC: 42394	INSTALLATION: RC, Pigman	BLDG/RM NO.: Seaford
LOCATION/CODE: Administrative Areas/AA	OPERATION/CODE: Administrative Operations/ADO	
SURVEY DATE: 13 Jun 03	EVALUATOR (Initials): AG	
MACOM/CODE: 7A	SUBMACOM/CODE: XX	SUPERVISOR: SSG Non-Responsive
TELEPHONE/DSN NO.: (302) 326-7634	UNIT/ORGANIZATION: National Guard	RAC: 5 / FREQUENCY (hrs/day): 8
NO. CIV(S):	NO. MIL: 4	NO. CONTRACTOR(S): / NO. LOC(S): / NO. OTHER:

SECTION 2. FACILITY DATA

LAB HOODS: 0	VAPOR DEGREASERS: 0	SPRAY BOOTHS: 0
MAINTENANCE BAYS: 0	OPEN SURFACE TANKS: 0	VENTILATION UNITS: 0

SECTION 3. SURVEY DATA

CONTROLS PRESENT	EVALUATION	UNIT CODE	CONTROLS REQUIRED	STATUS

PERSONAL PROTECTIVE EQUIPMENT (R = Required; U = Utilized)

GLOVES	R/U	RESPIRATOR	NIOSH TC NO.	MANUFACTURER	R/U
ACID	/	AIRLINE			/
COLD SURFACES	/	ABRASIVE BLASTING HOOD			/
HOT SURFACES	/	DISPOSABLE			/
NBC AGENTS	/	FULL FACE AIR PURIFYING			/
OIL	/	1/2 FACE AIR PURIFYING			/
SOLVENTS	/	POWERED AIR PURIFYING			/
SURGICAL GLOVES	/	1/4 FACE AIR PURIFYING			/
		SELF CONTAINED			

EYES/FACE	R/U	HEARING	R/U	BODY	R/U	HEAD/FIT	R/U
CHEMICAL SPLASH	/	CANAL CAPS	/	APRONS	/	COLD WEATHER BOOTS/HATS	/
FULL FACE SHIELD	/	EARPLUGS	/	COLD WEATHER CLOTHING	/	HARD HATS	/
CHEMICAL/SAFETY	/	HELMETS	/	COVERALLS	/	IMPERMEABLE BOOTS	/
SAFETY/IMPACT	/	MUFFS	/	FULL BODY SUIT	/	SAFETY/CONDUCTIVE SHOES	/
WELDING HELMET	/	MUFF/EARPLUG COMBO	/	HEAT REFLECTIVE VEST/SUIT	/	SAFETY/NON-CONDUCTIVE SHOES	/
		MUFF/EARPLUG W/TIME LIMIT	/	SAFETY BELT/HARNESS	/		/

  Attach 4

SECTION 4. HAZARD INVENTORY DATA

CAS CODE	HAZARD DESCRIPTION	PAC	EPC
POVDTXXXX	Video Display Terminal	3	D

SECTION 5. PERSONNEL DATA

LAST NAME	FIRST NAME	MI	SEX	SSN	CATEGORY
Non-Responsive			M	Non-Responsive	MIL
		A	M		MIL
			F		MIL
			M		MIL

SECTION 6. COMMENTS

☐ No comments ☐ See attached sheet

Survey conducted by MS Non-Responsive. Building contains four full-time employees. Employees perform mainly administrative functions.

PRIVACY ACT STATEMENT

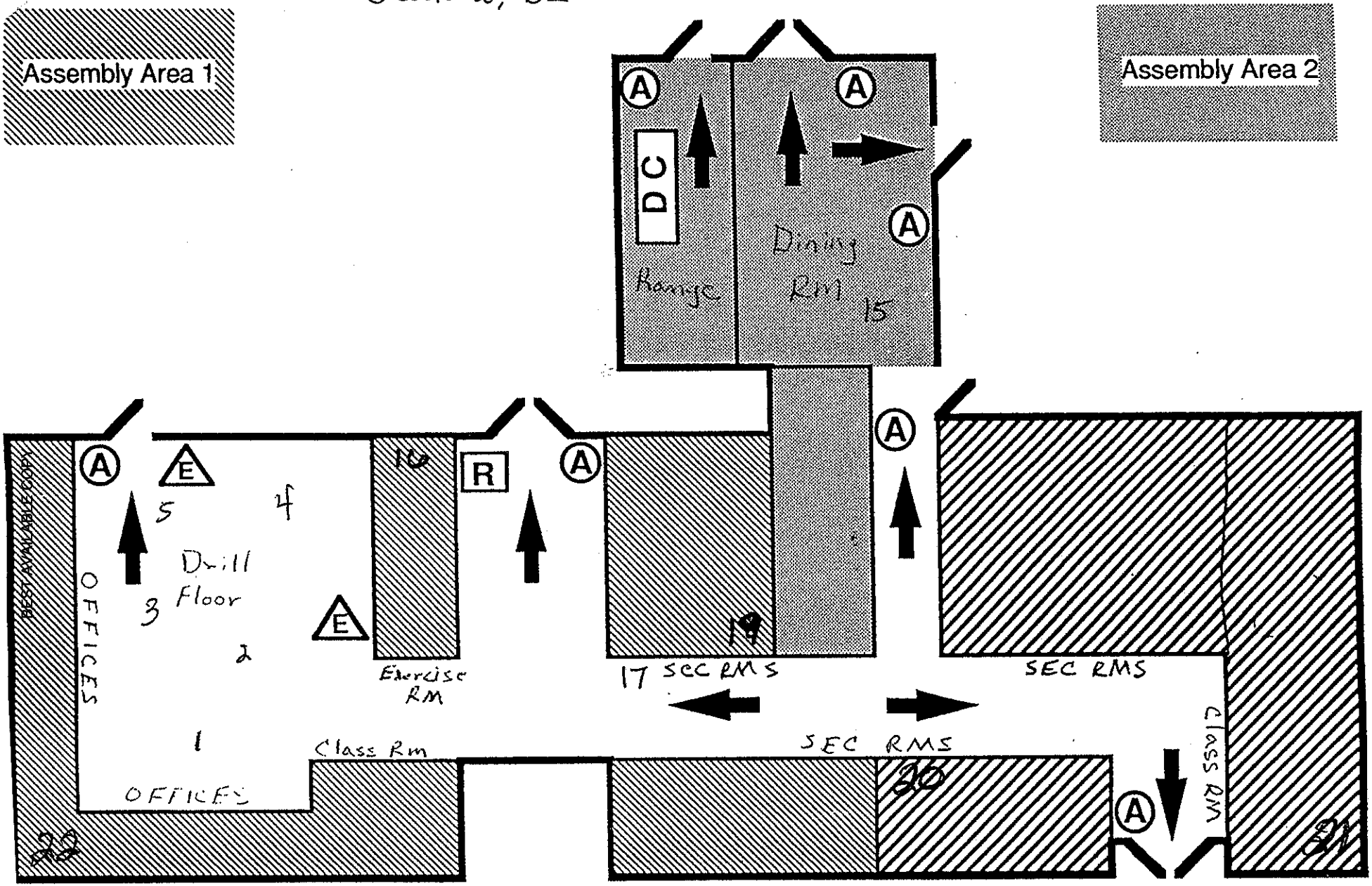
Title 5 US Code, Section 301; Executive Order 9397 authorizes the use of your Social Security Number as an identification number. The purpose of this information is to identify and monitor data relating each DA civilian and military employee exposed to a hazardous workplace or operation. The use of this information is to provide histories of exposures for any given worker.

Disclosure of your Social Security Number is not mandatory; however, nondisclosures may result in untimely provision of proper medical monitoring.

Attach 4

Appendix B
Building Layout

Seaford, DE



John H. Pigman Armory
Evacuation/Fire Plan

Assembly Area 3

Appendix C
Sampling Sheets and Laboratory Analyses

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	Delaware National Guard Survey	**Chain Of Custody:**	118596
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Seaford	**Date Analyzed:**	10/14/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	1002	**Report Date:**	14-Oct-03
Attention:	[redacted]				

Summary of Atomic Absorption Analysis for Lead

AMA Sample Number	Client Sample Number	Analysis Type	Sample Type	Air Volume (L)	Area Wiped (ft²)	Reporting Limit		Final Result		Comments
0401605	DESEA275-1	Furnace	Wipe	****	0.111	2.70	ug/ft²	12	ug/ft²	
0401606	DESEA275-2	Furnace	Wipe	****	0.111	2.70	ug/ft²	18	ug/ft²	
0401607	DESEA275-3	Furnace	Wipe	****	0.111	2.70	ug/ft²	19	ug/ft²	ok
0401608	DESEA275-4	Furnace	Wipe	****	0.111	2.70	ug/ft²	7.5	ug/ft²	
0401609	DESEA275-5	Furnace	Wipe	****	0.111	2.70	ug/ft²	8	ug/ft²	
0401610	DESEA275-6	Furnace	Wipe Blank	****	N/A	0.30	ug	0.76	ug	

Analysis Method for Flame: Air, Wipes, Paints, and Soil/Solids: EPA 600/R-93/200(M)-7420; Water: SM-3111B
Analysis Method For Furnace: Air, Wipes, Paints, and Soil/Solids : EPA 600/R-93/200(M)-7421; Water: SM-3113B
N/A = Not Applicable mg/Kg = parts per million (ppm) by weight mg/L = parts per million (ppm)
%Pb = percent lead by weight ug = micrograms ug/L = parts per billion (ppb)
Note: All results have two significant digits. Any additional digits shown should not be considered when interpreting the result.

Analyst: [redacted] **Technical Manager:** [redacted]

Reservoirs Environmental, Inc.
2059 Bryant St. Denver, CO 80211
(303) 964-1986 Fax (303) 477-4275 Toll Free (866) RESI-ENV

June 26, 2003

Project Description:
RES 94325-1
06-06
Delaware-Dagsboro,(Seaford)

Non-Responsive
Shaw Environmental, Inc.
312 Directors Drive
Knoxville TN 37923

Dear Customer,

Reservoirs Environmental, Inc. is an environmental analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the American Industrial Hygiene Association, Lab ID 101533 - Accreditation Certificate #480. The laboratory is currently proficient in both PAT & ELPAT programs respectively.

Reservoirs has analyzed the following sample(s) using Atomic Absorption (AA) / Atomic Emission Spectroscopy - Inductively Coupled Plasma (AES-ICP) per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in Table I. Results have been faxed to your office.

RES 94325-1 is the job number assigned to this study. This report is considered highly confidential and property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those authorized by the client. Samples will be disposed of after sixty days unless longer storage is requested. If you should have any questions about this report, please feel free to call me at 303-964-1986.

Sincerely,

Non-Responsive

President

RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Accredited Laboratory #101896
AIHA Certificate of Accredidation #480 LAB ID 101533

TABLE I. ANALYSIS: LEAD BY WIPE SAMPLING

RES Job Number:	**RES 94325-1**
Client:	**Shaw Environmental, Inc.**
Client Project Number / P.O.:	**06-06**
Client Project Description:	**Delaware-Dagsboro,(Seaford)**
Date Samples Received:	**June 18, 2003**
Analysis Type:	**USEPA SW846 3050B / AA(7420)**
Turnaround:	**3-5 Day**
Date Samples Analyzed:	**June 26, 2003**

Client ID Number	Lab ID Number	Sample Area (sq.ft.)	LEAD (µg)	Detection Limit (µg/sq.ft.)	LEAD CONCENTRATION (µg/sq.ft.)
DESEA164-1	EM 7851112	0.11	BDL	23	BDL
DESEA164-2	EM 7851113	0.11	BDL	23	BDL
DESEA164-3	EM 7851114	0.11	BDL	23	BDL
DESEA164-4	EM 7851115	0.11	3.8	23	35
DESEA164-5	EM 7851116	0.11	BDL	23	BDL
DESEA164-6	EM 7851117	0.11	BDL	23	BDL
DESEA164-7	EM 7851118	0.11	275.0	23	2500
DESEA164-8	EM 7851119	0.11	163.0	23	1482
DESEA164-9	EM 7851120	0.11	1210.0	23	11000
DESEA164-10	EM 7851121	0.11	210.0	23	1909
DESEA164-11	EM 7851122	0.11	490.0	23	4455
DESEA164-12	EM 7851123	0.11	BDL	23	BDL
DESEA164-13	EM 7851124	0.11	5710.0	23	51909
DESEA164-14	EM 7851125	0.11	4670.0	23	42455

***Calculations Based On A 1 sq.ft. Sample Area Unless Otherwise Noted**

BDL = Below Detection Limit

Data Qa

RESERVOIRS ENVIRONMENTAL, INC.

2059 Bryant St., Denver CO 80211

Due Date: 6/23-6/25

Due Time: 10:00

RESI Job #: RES 94326

Page 1 of 1

SAMPLES SUBMITTED BY:		[redacted] O: (IF DIFFERENT)
Company	Shaw Environmental, Inc.	
Address	312 Directors Drive	Army National Guard ...
	Knoxville, TN 37923	301-W Old Bay Ln, Havre de Grace, MD 21078
Contact	[redacted]	

Phone: (302)369-3736 Fax: (410)436-2183 Pager:

Contact: Phone: Fax: Pager:

Project Number and/or P.O. #: 04-06

Project Description/Location: Delaware - Dagsboro (Seaford)

[redacted] ...e Email Address: ...itzer... .com

After Hours/Weekend CHARGE: Amount $ ______ Authorized by: ______

Additional fees apply for after hours and holidays for all analysis types. Samples will be analyzed during normal laboratory hours unless otherwise arranged and specified on the chain of custody. Turnaround is subject to laboratory volume. You will be notified if delays are expected.

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm

PCM/PLM ___ 2 Hour RUSH ___ 24 hour ___ 3-5 weekdays

TEM ___ 6 Hour RUSH ___ 24 hour ___ 3-5 weekdays

Prior Notice REQUIRED for TEM 6 Hour RUSH

METALS LABORATORY HOURS: Weekdays: 8am - 6pm

AA ___ SPECIAL RUSH ___ 24 Hour X 3-5 Day

RCRA 8 ___ SPECIAL RUSH ___ 5 Day ___ 10 Day

TCLP ___ SPECIAL RUSH ___ 5 Day ___ 10 Day

Prior Notice REQUIRED for SPECIAL RUSH AA, RCRA or TCLP. RCRA and TCLP SPECIAL RUSH is 3 Day Turnaround

ANALYTICAL METHOD

AIR [ ] PCM 7400A, 7400B, OSHA

[ ] TEM AHERA, Level II, 7402, ISO, Direct, ISO-Indirect Preps, Chatfield

[ ] AA / ICP ______ Metal ___ RCRA 8

Dust: Total, Respirable

BULK [ ] PLM Short report, Long report, Point Count

[ ] TEM ..., Quant, Semi-quant

[X] AA / ICP Pb Metal ___ RCRA 8

Paint, Soil, Dust, Wipe, TCLP

(ASTM E-1792 approved wipes only)

WATER [ ] TEM Drinking, Waste Water

[ ] AA Metal ______ Metal ___ RCRA 8

Drinking, Waste Water

OTHER [ ] Food

Special Instructions: Please report in ft2. Contract # 78-287. Email results to kenneth.forsythe@md.ngb.army.mil

	Client Sample Number	Volume	EM #
1.	DE SEA164 - 1	3x4" wipes	785112
2.	" - 2		13
3.	" - 3		14
4.	" - 4		15
5.	" - 5		16
6.	" - 6		17
7.	" - 7		18
8.	" - 8		19
9.	" - 9		20
10.	" - 10		21
11.	" - 11		22
12.	" - 12		23
13.	" - 13		24
14.	" - 14	↓	25
15.			

Number of samples received: (14) (Use as many additional sheets as needed.)

NOTE: If a package has sustained substantial damage or the custody seal is broken, stop and contact project manager and shipper. RESI will analyze incoming samples based upon information received with those samples. RESI is not responsible for errors or omissions in calculations resulting from the inaccuracy of original data. Turnaround times are based upon times of rece[redacted]mples guaranteed in short turnaround.

Relinquished By: [redacted] Fed Ex # [illegible] Date/Time: 6/18/03 12:00

Laboratory [redacted] Date/Time: 6/18/03 10:00

Received By:

Condition: ... Sent upon receipt

RESULTS: ...ax Email Date Time Initials

SPLITS:	Authorization By/Time:	Lab Bench/Count Sheets Received By:
	Analytical Method/Turnaround:	Time: Date:
rev 6/2001	Results Due: Results Out:	

Phone: (303) 964-1986 Fax: (303) 477-4275 WATS: 1-866-RESI ENV (737-4368)

PAGER: ONCALL Pager number available at Lab, Alternate Pagers: PLM/TEM 509-2187 PCM/Metals 509-2066 (AFTER HOURS USE ONLY)

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
312 Directors Drive
Knoxville, TN 37923

Reference Data:	Lead
Client Sample No.:	DEDAG164-A1 through DESEA164-A3
P.O. No.:	Not Available
Sample Location:	Delaware
Sample Type:	Filter
Method Reference:	NIOSH 7300
DCL Set ID No.:	03-S-2977
DCL Sample ID No.:	03-18840 through 03-18845
Sample Receipt Date:	6/18/2003
Preparation Date:	06/19/03
Analysis Date:	06/19/03

The samples were prepared and analyzed in accordance with NIOSH method 7300 using a Perkin Elmer 3000XL ICP.

The sample condition upon receipt was acceptable except where noted.

The results are in the enclosed data table. Results relate only to the items tested and are not blank corrected unless indicated in the data table.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Non-Responsive
Analyst

Non-Responsive
Reviewer

CINCINNATI OFFICE
4388 GLENDALE-MILFORD ROAD
CINCINNATI, OHIO 45242-3706
513 733-5336, FAX 513 733-5347

WEST COAST OFFICE
11 SANTA YORMA COURT
NOVATO, CALIFORNIA 94945
800 280-8071, FAX 415 893-9469

Results
Lead

Client #	DCL #	Sample Volume (L)	µg/sample	mg/m^3
DEDAG164-A1	03-18840	173.88	ND	<0.006
DEDAG164-A2	03-18841	114.77	ND	<0.009
DEDAG164-A3	03-18842	0	ND	-
DESEA164-A1	03-18844	223.25	ND	<0.004
DESEA164-A3	03-18845	0	ND	-
	Prep Blank		ND	
% Recovery	LCS		103.	
RPL			1.	

ND = not detected at or above the reporting limit (RPL).
LCS = laboratory control sample.

Non-Responsive

Analyst

Non-Responsive

Reviewer

DATA CHEM LABORATORIES

ANALYTICAL REQUEST FORM

1. REGULAR Status

RUSH Status Requested - ADDITIONAL CHARGE

RESULTS REQUIRED BY _____ DATE

CONTACT DATACHEM LABS PRIOR TO SENDING SAMPLES.

2. Date 6/13/03 Purchase Order No. _____

3. Company Name Shaw Environmental, Inc.

Address 312 Directors Drive

Knoxville TN 37923

Person to Contact Non-Responsive

Telephone (302) 369-8736

Fax Telephone (410) 436-2163

Billing Address (if different from above)

Non-Responsive - Army National Guard IH-W

301-IH, Old Bay Lane, Havre de Grace, MD

4. Quote No. _____

DCL Project Manager _____

5. Sample Collection

Sampling Site Delaware

Industrial Process _____

Date of Collection 6/13/03

Time Collected Various

Date of Shipment 6/17/03

Chain of Custody No. 016-05

Non-Responsive

6. REQUEST FOR ANALYSES 03-52-2978 21078

Laboratory Use Only	Client Sample Number	Media Type*	Sample Volume (Liters)	ANALYSES REQUESTED - Use Method Number if Known
18840	DEDAG164-A1	MCEF	173.88	Lead
18841	" -A2	"	114.77	
18842	" -A3	"	Blank	
18843	-PC1	Bulk		
18844	DESEA164-A1	MCEF	223.25	
18845	" -A3	MCEF	Blank	
18846	" -PC1	Bulk		

*Specify: Solid sorbent tube, e.g. Charcoal; Filter type; Impinger solution; Bulk Sample; Blood; Urine; Tissue; Soil; Water; Other

7. **QC REQUIREMENTS MUST BE COMPLETED FOR ENVIRONMENTAL SAMPLES** - See General Services Terms and Conditions; QC samples billed at regular sample rate

☐ METHOD QC SAMPLES (Lab QC according to published methods)

☐ PROJECT PLAN QC SAMPLES (Lab QC according to provided QA/QC Plan)

☐ NO QC SAMPLES REQUESTED (May not conform to Agency requirements)

☐ OTHER (as specified below)

Non-Responsive

Comments _____

Possible Contamination and/or Chemical Hazards

8. Requested by Non-Responsive

950 West LeVoy Drive / Salt Lake City, UT 84123 800-356-9135 or 801-266-7700 / Fax: 801-268-9992
4388 Glendale-Milford Road / Cincinnati, OH 45242 800-458-1493 or 513-733-5336 / Fax: 513-733-5347

DATACHEM LABORATORIES - A SORENSON COMPANY

DISTRIBUTION: WHITE - LABORATORY COPY CANARY - CUSTOMER COPY

Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory **Location:** Seaford
Date: 6/13/03

Sample 1
Sample Number: DESEA164-A1
Pump: 647615

	Pre Flow Rate	Post Flow Rate
	2.482	2.457
	2.489	2.479
	2.485	2.475
Average	2.485	2.476

Average Pre and Post 2.481

Time 1 12:51
Time 2 2:21
Total Time Sampled
Minutes Sampled 90 minutes

Volume ~~2.481~~ 223.25 **Liters**

Sample 2
Sample Number: DESEA164-A2
Pump: 648339

	Pre Flow Rate	Post Flow Rate
	2.439	
	2.466	
	2.475	
Average	2.460	

Average Pre and Post

Time 1
Time 2
Total Time Sampled
Minutes Sampled

Volume **Liters**

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
312 Directors Drive
Knoxville, TN 37923

Reference Data:	Lead
Client Sample No.:	DEDAG164-PC1 through DESEA164-PC1
P.O. No.:	Not Available
Sample Location:	Delaware
Sample Type:	Paint Chip
Method Reference:	3050B/6010B
DCL Set ID No.:	03-S-2977
DCL Sample ID No.:	03-18843 through 03-18846
Sample Receipt Date:	6/18/2003
Preparation Date:	6/23/2003
Analysis Date:	6/25/2003

The samples were prepared in accordance with EPA method 3050B. Sample condition was acceptable upon receipt except where noted. The samples were then analyzed in accordance with EPA method 6010B using a Jarrell Ash 61E ICP.

The results are provided in the enclosed data table. Results relate only to the items tested and are not blank corrected unless indicated in the data table.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Non-Responsive

Analyst

Non-Responsive

Reviewer

CINCINNATI OFFICE
4388 GLENDALE-MILFORD ROAD
CINCINNATI, OHIO 45242-3706
513 733-5336, FAX 513 733-5347

WEST COAST OFFICE
11 SANTA YORMA COURT
NOVATO, CALIFORNIA 94945
800 280-8071, FAX 415 893-9469

Results
Lead

Client #	DCL #	mg/Kg (ppm)	% by weight
DEDAG164-PC1	03-18843	ND	<0.0030
DESEA164-PC1	03-18846	56.	0.0056
	Prep Blank	ND	
% Recovery	LCS	97.	
% Recovery	18725MS	96.	
% Recovery	18725MSD	97.	
RPL		30.	0.0030

ND = not detected at or above the reporting limit (RPL).
LCS = laboratory control sample.
MS/MSD = matrix spike/matrix spike duplicate.

Non-Responsive [redacted]
Analyst

Non-Responsive [redacted]
Reviewer

DATA CHEM LABORATORIES

ANALYTICAL REQUEST FORM

1. REGULAR Status

RUSH Status Requested - ADDITIONAL CHARGE
RESULTS REQUIRED BY _____ DATE
CONTACT DATACHEM LABS PRIOR TO SENDING SAMPLES.

2. Date 6/13/03 Purchase Order No. _____

3. Company Name Shaw Environmental, Inc.
Address 312 Directors Drive
Knoxville, TN 37923
Person to Contact Non-Responsive
Telephone (302) 369-3736
Fax Telephone (410) 436-2163
Non-Responsive rent from above)
Army National Guard IH-W
301-IH, Old Bay Lane, Havre de Grace, MD

4. Quote No. _____
DCL Project Manager _____

5. Sample Collection
Sampling Site Delaware
Industrial Process _____
Date of Collection 6/13/03
Time Collected Various
Date of Shipment 6/17/03
Chain of Custody No. 06-05
Collector's Non-Responsive

6. REQUEST FOR ANALYSES 03-52-2977 21078

Laboratory Use Only	Client Sample Number	Media Type*	Sample Volume (Liters)	ANALYSES REQUESTED - Use Method Number If Known
18840	DEDAG164-A1	MCEF	173.88	Lead
18841	" -A2	"	114.77	
18842	" -A3	"	Blank	
18843	-PC1	Bulk		
18844	DESEA164-A1	MCEF	223.25	
18845	" -A3	MCEF	Blank	
18846	" -PC1	Bulk		

*Specify: Solid sorbent tube, e.g. Charcoal; Filter type; Impinger solution; Bulk Sample; Blood; Urine; Tissue; Soil; Water; Other

7. Q C REQUIREMENTS
MUST BE COMPLETED FOR ENVIRONMENTAL SAMPLES - See General Services Terms and Conditions: QC samples billed at regular sample rate

☐ METHOD QC SAMPLES (Lab QC according to published methods)
☐ PROJECT PLAN QC SAMPLES (Lab QC according to provided QA/QC Plan)
☐ NO QC SAMPLES REQUESTED (May not conform to Agency requirements)
☐ OTHER (as specified below)
Non-Responsive

Comments _____

Possible Contamination and/or Chemical Hazard _____

8. Requested by Non-Responsive

960 West LeVoy Drive / Salt Lake City, UT 84123 800-356-9135 or 801-266-7700 / Fax: 801-268-9992
4388 Glendale-Milford Road / Cincinnati, OH 45242 800-458-1493 or 513-733-5336 / Fax: 513-733-5347
DATACHEM LABORATORIES - A SORENSON COMPANY

DISTRIBUTION: WHITE - LABORATORY COPY CANARY - CUSTOMER COPY

Appendix D
References

References

Title 29, Code of Federal Regulations CFR), Part 1910, Occupational Safety and Health Administration (current edition)

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc (ASHRAE) 62-2002, Ventilation for Acceptable Indoor Air Quality

Instructions for Completing the Sampling of ARMY National Guard Armories, Lead Wipe Sampling Procedure included with the Request for Proposal

Air Sampling for Lead - Method 7082 of the National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods

Design Guide DG-415-2, Logistics Facilities, National Guard Bureau Installation Division, 14 December 1999

Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998

Army Regulation (AR) 40-5, Medical Service, Preventative Medicine, 15 October 1990

AR 385-10, The Army Safety Program, 29 February 2000

Department of the Army Pamphlet (DA PAM) 40-501, Medical Services, Hearing Conservation Program, 10 December 1998

DA PAM 40-503, Medical Services, Industrial Hygiene Program, 30 October 2000

Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH) (current edition)

Guidelines for Converting Indoor Firing Ranges to Other Uses, Headquarters, Department of the Army and the Air Force, NG PAM (AR) 385-16/ANGPAM 91-101, 31 January 1994

24 CFR, Part 35, Subpart B, Section 35-110, Definition of Lead-Based Paint, Housing and Urban Development, U. S. Department of Housing

Subject: Recommendations for Surface Lead Dust in Armories

1. In armories that do not contain childcare facilities, the National Guard Bureau (NGB) Region North Industrial Hygiene Office recommends cleaning the areas in which sample results are greater than 200 micrograms per square foot ($\mu g/ft^2$). If a special function will be held in which children will be present in this facility, consider thoroughly cleaning the areas that will be accessible to children prior to the function. This guidance is based on professional judgment, risk assessments, adaptation of Occupational Safety and Health Administration (OSHA) guidance, and feasibility of cleaning to a certain level.

a. Environmental Protection Agency (EPA) standards (40 Code of Federal Regulations (CFR) 745.227(h)(3)) are not directly applicable because they are criteria for dust-lead hazards developed for floors (40 $\mu g/ft^2$) and windowsills (250 $\mu g/ft^2$) in residential dwellings and child occupied facilities. A child occupied facility is defined as a building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Most of the wipe samples in armories were collected in undisturbed areas and therefore, results are worst case scenarios and do not correlate to these standards.

b. OSHA has no specific requirement for work area surfaces. The lead standard (29 CFR 1910.1025(h)) states that all surfaces shall be maintained as free as practicable of accumulations of lead dust. In workplaces where lead dust is generated, surface levels may be much higher, but personnel exposures can be controlled by limiting airborne lead levels and following good cleanup and hygienic practices.

c. OSHA used to cite a level of 200 $\mu g/ft^2$ in their Technical Manual and 29 CFR 1926.62 as guidance to its own inspectors for evaluating the cleanliness of lunchroom and locker room surfaces that are supposed to be kept as clean as possible.

d. In a report titled Derivation of Wipe Surface Screening Levels for Environmental Chemicals, the US Army Center for Health Promotion and Preventive Medicine (USACHPPM) has determined that 200 $\mu g/ft^2$ is a safe surface contamination level. They have also applied these standards as the decontamination levels for surfaces in administrative offices.

e. It should be noted that levels above these recommendations do not necessarily mean there is a significant hazard to workers who are following good cleaning and hygienic practices since there is no correlation between wipe and air samples. Rather, we recommend these levels as a precautionary measure.

2. The NGB Occupational Health Branch is developing guidance for armories that are used as childcare facilities. All states will receive this guidance when it is completed. In the interim, we recommend the following actions:

a. Clean all areas that will be accessible to children to the EPA dust-lead standard

for children 6 years of age or under (40 $\mu g/ft^2$ on floors and 250 $\mu g/ft^2$ on windowsills).

b. Refer to the local authorities' regulations since they can be more stringent than federal regulations.

c. Post signs in the area to inform people of the presence of lead dust and its effects.

d. If soldiers clean weapons in the facility change the policy so that they cannot clean their weapons in the facility, or if they are allowed to clean their weapons indoors, they must clean the area by wet wiping and mopping the area when they are done.

e. If the paint is peeling, contact the state Environmental Office to test for lead content and provide recommendations.

3. Air samples collected on individuals in the armory were well below OSHA's permissible exposure limit for lead (29 CFR 1910.1025(c)) of 0.05 mg/m^3 averaged over an 8-hour day. Therefore, based on these conditions there is currently no overexposure to personnel from lead dust in this building.